Occupational Therapy Association of Southern Africa

SOUTH AFRICAN JOURNAL OF OCCUPATIONAL THERAPY

VOLUME 53, NUMBER 2, AUGUST 2023, ISSN 0038-2337

TABLE OF **CONTENTS**

OTASA ADDRESS

Postal: OTASA Office, P.O. Box 1165,
Hatfield 0028
Street: 1A Hatfield Bridge Office Park, 213 Richard Street (c/o Stanza Bopape Street), Hatfield, Pretoria, 0028
Telephone: +27 (12) 362-5457
Email: otoffice@uitweb.co.za
Web site: www.otasa.org.za
Journal mail: sajot@mweb.co.za
Journal Web site: www.sajot.co.za

ISSN Print: 0038-2337
ISSN On-line: 2310-3833

EDITORIAL COMMENT

ISSN Oline2310-3833

DOI: https:/doi.org/10.17159/2310-3883/2023/vol53n2a1
South African Journal of Occupational Therapy. 2023; 53(2)

Responsible knowledge use: The importance of critical appraisal in occupational therapy research and publication

In a recent post in the *Scholarly Kitchen*, Todd Carpenter reminded us that "The publishing process has always relied on technology, from paper and ink with which scribes noted their work… to the earliest typesetters and printers, to the digital markup and repository tools of today"[1:1]. Digital information is ubiquitous and accessible to us all to enrich our knowledge and provide a launchpad from which we generate new knowledge. While this ever-expanding technology makes information available literally *at the touch of a button*, it is the responsibility of all users of information to have guardrails in place and critically evaluate all information sourced to safeguard the scholarly record.

Evidence-based practice (EBP) encourages the generation of, and use of knowledge to guide practice which responds to the diverse occupational needs of the people we work with[2-4]. Critical appraisal is a key element of EBP and is the process by which we determine and critically evaluate the rigour, impact, relevance, and acceptability of the knowledge or information we have sourced to answer a focused question we have posed in relation to our teaching, research and/or practice[5-6]. We live in a world where access to knowledge is ever increasing, and this provides exciting opportunities for occupational therapists to use knowledge to inform their practice. Knowledge is indeed power, but as socially responsive and evidence informed professionals, we must be responsible in the use of this power. Sadly, not all information is the best match to guide our teaching, practice, and research. It is for this reason that we should conduct a critical appraisal of existing knowledge in relation to the following dimensions:

1. Methodological rigour

Here we should ask the question: *How well has the study been carried out?* Using this lens, we explore how confident we are that the study design has been appropriately applied and that the results are not due to chance, other confounding variables and/or bias.

2. Impact

Here we should ask the question: *What is the impact or clinical value of the results/findings of the study or alternatively What is the value of the study findings for my teaching, my research, and my practice?* This demands careful consideration of the intervention goals you and your clients/students/research participants have developed and how the results will help achieve these goals.

3. Relevance and applicability

Here we should ask the question: *Can these study findings be applied in our context to guide our teaching, research, and/or practice?* This question encourages us to think about what might limit us from applying the study findings, and if it is worthwhile to consider addressing these limitations, to be able to apply the study results.

4. Responsibility

A fourth dimension, 'responsibility' relates to the question: *What further research do we have to engage in to generate evidence for the questions that remain after our appraisal of the existing evidence?* This is important given that we hold a responsibility to both engage with and generate knowledge which will guide best practice[7].

The *South African Journal of Occupational Therapy* (SAJOT) publishes papers that contribute to the dissemination of knowledge which has been critically appraised through rigorous editorial practices and a double blinded review process in relation to the above four dimensions. Continued engagement with knowledge published in SAJOT and other journals, will help contribute to an ongoing appraisal of the existing knowledge-base and will encourage further discussion and research to support the development of the profession.

Pamela Gretschel
https:/orcid.org/0000-0002-7890-3635

Blanche Pretorius
https:/orcid.org/0000-0002-3543-0743

Helen Buchanan
https:/orcid.org/0000-0001-5540-9926

REFERENCES

1. Carpeneter, T. A Serious Game for Scholarly Publishers: The STM Trends 2027 Helps Publishers Level Up. The Scholarly Kitchen, April 2023. https:/scholarlykitchen.sspnet.org/2023/04/28/the-stm-association-released-its/#:~:text=The%20STM%20Trends%202027%20output,Social%20Responsibility%20and%20Research%20Integrity
2. Buchanan, H. (2017). Evidence-based practice and practice-based evidence. In: S. Dsouza, R. Galvaan, E. Ramugondo (Eds.). Concepts in Occupational Therapy: Understanding Southern Perspectives. Manipal University Press, pp. 316-339.
3. Franzsen, D. & Pretorius, B. The need for high quality clinical

research in occupational therapy. South African Journal of Occupational Therapy. Vol 53 No1, April 2023. https:/doi.org/10.17159/2310-3883/2023/vol53n1a1
4. Pitout, Hanlie. (2014). Barriers and strategies to increase research involvement of South African occupational therapists. South African Journal of Occupational Therapy, 44(2), 17-21. Retrieved June 18, 2023, from http:/www.scielo.org.za/scielo.php?script=sci_arttext&pid=S2310-38332014000200005&lng=en&tlng=en.
5. Hoffmann, T., Bennett, S & Del Mar, C (2013). Introduction to evidence-based practice. In Hoffmann, T., Bennett, S & Del Mar, C (Eds.). Evidence Based Practice across the Health Professions. Sydney: Churchill Livingston.
6. Sackett, D.L., Richardson, W.S., Rosenberg, W.M., & Haynes, R.B. (1997). Evidence-Based Medicine: How to Practice and Teach EBM. 1st ed. New York: Churchill Livingstone.
7. Critical Appraisal Skills Programme http:/www.casp-uk.net/

Useful resources

- https:/guides.library.unisa.edu.au/OccupationalTherapy/OTFieldPractice4
- http:/www.otseeker.com/Info/Tutorial.aspx
- https:/pressbooks.pub/0ptimizingyourcapstoneexperience/chapter/3/

Occupational therapists' acceptance of 3D printing

AUTHORS

Shelley Louise Barter [a, c]
https://orcid.org/0000-0002-3692-8519
Alexandra Jean Williams [b, c]
https://orcid.org/0000-0002-8557-5860
Gina Rencken [c]
https://orcid.org/0000-0002-3658-4453
Nonjabulo Ndaba [c]
https://orcid.org/0000-0002-8273-028X
Pragashnie Govender [c]
https://orcid.org/0000-0003-3155-3743

AFFILIATIONS

[a] Hillcrest Private Hospital, KwaZulu-Natal, South Africa
[b] Entabeni Rehabilitation Unit, KwaZulu-Natal, South Africa
[c] Discipline of Occupational Therapy, School of Health Sciences, University of KwaZulu-Natal, Durban, South Africa

CORRESPONDING AUTHOR

Pragashnie Govender
naidoopg@ukzn.ac.za

KEYWORDS

assistive technology, three-dimensional printing (3DP), Technology Acceptance Model (TAM), additive manufacturing, orthosis, splinting, assistive devices

HOW TO CITE THIS ARTICLE

Barter SL, Williams AJ, Rencken G, Ndaba N, Govender P. Occupational Therapists' acceptance of 3D printing. South African Journal of Occupational Therapy. Volume 53 No 2. August 2023. DOI: https://doi.org/10.17159/2310-3833/2023/vol53n2a2

ARTICLE HISTORY

Submitted: December 2022
Reviewed: April 2023
Revised: April 2023
Accepted: April 2023
Published: August 2023

EDITOR

Hester van Biljon
https://orcid.org/0000-0003-4433-6457

DATA AVAILABILITY

Upon reasonable request, from the corresponding author.

FUNDING

The first author, Shelley Louise Barter, received tuition remission towards the study from which this paper emanates.

ISSN On-line 2310-3833

ABSTRACT

Introduction: In occupational therapy, three-dimensional printing is being explored as an alternative design and manufacturing technique to the conventional fabrication of orthotics and assistive devices. The global applications and literature are rapidly growing, but the South African – specific literature is deficient. The Technology Acceptance Model depicts that one's perception of any particular technology is a significant determinant of their acceptance of it, determining whether the technology system is successfully adopted or disregarded.

Aim: To determine the perceived acceptance of three-dimensional printing technology amongst occupational therapists in KwaZulu-Natal and whether exposure to the technology system, in the form of a three-dimensional printing workshop, influences their perception of the technology.

Method: The study followed a multi-method design consisting of two phases; phase one involved the creation of the intervention tool (workshop), which was developed through a process guided by Design-Based Research. Phase two involved the implementation of the intervention and data collection. Therapists documented their perceptions in a questionnaire before and after exposure; following a pre and post-test design, enabling comparison. The questionnaires were based on the Technology Acceptance Model, including 13 questions scored on a seven-point Likert scale and five open-ended questions. The quantitative data were analysed descriptively, and qualitative data were analysed thematically.

Results: All four categories of the Technology Acceptance Model-based questionnaire displayed a significant change ($p < 0.05$) between the pre and post-test responses, with a medium effect size.

Conclusion: Exposure to three-dimensional printing influences therapists' perception of the technology.

IMPLICATIONS FOR PRACTICE

- The application of Three-Dimensional Printing (3DP) in occupational therapy practice has the potential to enable increased accuracy and precision of items fabricated by therapists; enabling customisation and individualisation to the exact specifications of a patient.
- 3DP can open doors to a broad spectrum of items that are not easily accessible, affordable, or not even available, accessing ideas and blueprints from a global pool of resources through open-source sites.
- With the process of fabrication being digital, not only does this reduce manual labour, but fabricating without touching the patient can reduce pain and prevent disruption of a repair/ surgical site/ wound.
- The digital process also allows patients to see and visualise the product during the design process, enabling input prior to printing, contributing to reduced wastage.

INTRODUCTION

Three-Dimensional Printing (3DP), also known as additive manufacturing, is a type of manufacturing whereby items are fabricated in consecutive layers with guidance from a computer-aided design (CAD) file[1]. Until recently, 3DP technology remained largely inaccessible to the general public, dominated primarily by prominent stakeholders[2]. Today, the applications of 3DP have expanded to the general market, from the commercial and academic environments to clinical settings as well[3].

The application of 3DP across healthcare domains is rapidly expanding, completely revolutionising traditional practices with the ability to create whilst ensuring personalisation, time efficiency and accuracy[4-5]. In occupational therapy practice specifically, 3DP is being explored as an alternative design and manufacturing technique to conventional processes within two areas of practice: assistive devices and splinting/orthotics[6]. Technology may present hurdles to current practices; however, it also provides new opportunities for enhancing and enabling patient engagement and meaning in life. For this reason, it is recommended that therapists engage beyond their typical practices to advocate for their patients[7].

Despite the rapid advancements in technology globally, acceptance and resultant use of advancements such as 3DP by individuals, in this case, occupational therapists, cannot be assumed and therefore, must be examined[8]. This study aimed to determine the perceived acceptance of 3DP technology by occupational therapists working in South Africa. The findings of this study are intended to provide a gateway to further research and advancements in occupational therapy practice and service delivery within the South African context.

LITERATURE REVIEW

The South African healthcare system and access to assistive technology

South Africa has a two-tiered healthcare system. The public sector is underfunded and services three-quarters of the population, whilst the private sector is grossly inaccessible to the majority due to the exorbitant cost of private care[9]. In South Africa, approximately 7.5% of the population lives with a disability[10]. Individuals living with disabilities require assistive technology (AT) that enables them to actively engage and complete a task that they would not otherwise be able to do[11]. Without access to the appropriate AT, an individual with a disability may be unable to access opportunities available to the able-bodied[12]. Equitable access for this population was documented in the South African National Development Plan (NDP)[13], this service however is fragmented and inaccessible. The government cannot meet between 35% and 85% of the total AT needs of the disabled population[12], and with the proposed implementation of National Health Insurance, the National Department of Health will be solely responsible for providing this essential service. The greatest challenge to provision of AT in South Africa is the financial constraints impacting on service delivery and availability of products. To bridge this gap, local innovation, product development, and manufacturing needs to be cultivated and supported[12].

3DP in the field of occupational therapy

Within the field of occupational therapy, 3DP is being explored as an alternative design and manufacturing technique to the conventional fabrication of orthotics and assistive devices (both of which fall within the domain of AT)[6]. An orthosis is a device applied externally to a body part to provide structural positioning or functional facilitation, referred to as 'splints' in the South African context. Fabricating orthoses requires clinical experience and can be labour-intensive[14]. 3DP may significantly reduce the equipment and materials required in the fabrication process of an orthotic. 3DP orthoses have also proven to be of lighter weight, better ventilated and more aesthetically pleasing compared to traditional thermoplastic orthoses[15]. Assistive devices are any item that enables an individual with a disability to complete a task that they would not otherwise be able to do[16]. 3DP has proven to be an effective method for designing, testing, and manufacturing unique assistive devices. The process has yielded greater patient satisfaction, functionality, and reduced cost[17].

Another advantage of 3DP is the availability of online open-source platforms. The digital blueprint designs are distributed and shared globally, with the end-user having the opportunity to customise the design for the specific needs of each patient[15]. Additionally, a potential benefit of using CAD is the opportunity for patient feedback during the design process prior to fabrication. This would cultivate a sense of ownership and improve patient satisfaction and subsequent compliance[14]. Input and feedback during the design process would also reduce unnecessary waste of materials, as adjustments can be made digitally before printing.

The gap in 3DP Research in occupational therapy

Limited research examines 3DP within healthcare and occupational therapy internationally, specifically in South Africa. This may be a barrier to potential advancements in therapy and technology integration for future practice. The Technology Acceptance Model (TAM) was developed in 1985, due to concern that employees were not using the Information Technology (IT) advancements made available to them. The original TAM consists of two major components: *perceived usefulness and perceived ease of use,* with the latter directly influencing the former. The model depicts that these two perceptions will influence the user's attitude towards the technology system, which will influence whether the user will accept or reject the technology. The two beliefs are directly influenced by the characteristics of the technology itself[8]. The TAM has become a leading model in explaining and predicting the acceptance and use of technology[18]. Previous empirical research studies have tested the TAM, and proven that tools based on this model have yielded results considered to be statistically reliable[19]. This study included questionnaires based on the TAM to determine therapists' perceived acceptance 3DP technology based on the following: usefulness, ease of use, attitude towards, and intention to use in future practice.

METHODOLOGY

Study design

The study used a multi- method design consisting of two distinct phases, outlined in Figure 1.

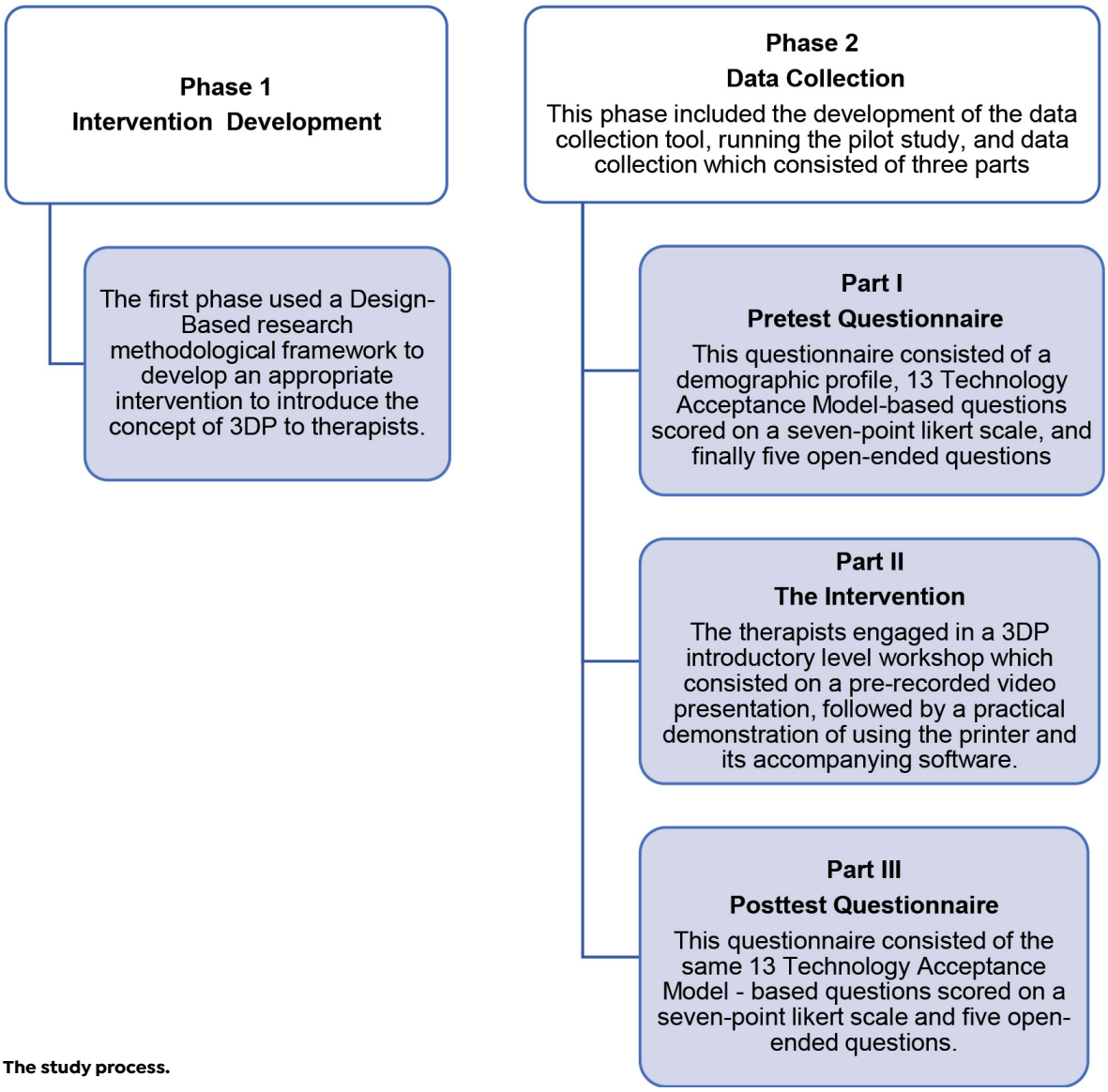


Figure 1: The study process.

Phase one: Intervention tool development

This phase was geared towards developing the intervention tool; the 3DP workshop and was guided by the Design-Based Research (DBR) process. The process begins with initially evaluating a problem within a specific context. Following this, a potential solution is designed – generally as an instructional tool. The researchers then test and develop the instructional tool through an iterative process, funnelling and refining the knowledge[20].

This research process is appropriate when the knowledge related to the problem is particularly new and when instructional material is lacking[21-23]. The DBR process is not a precise research methodology but rather a team collaboration engaged in a process of systematically examining, constructing, and evaluating information and tools for learning[22]. The DBR team consists of any stakeholder or collaborator whose expertise and knowledge contribute to development within the iterative cycle[21]. This team consisted of five co-authors. Three collaborators were clinicians with experience and published work in the field of splinting and rehabilitation in occupational therapy, and the other two are clinicians practicing in the field of physical rehabilitation in occupational therapy, with prior 3DP experience.

Phase two: Data collection

Phase two was geared towards developing the data collection tool, conducting the pilot study, and running the 3DP workshops and data collection process. Four workshops were run to cater to therapists in different areas in KwaZulu-Natal.

Study design: The second phase followed a quasi-experimental design consisting of a one-group pre-test, post-test design. In this study, the dependent variable was the therapists' perceived acceptance of 3DP technology, which was assessed before and after participating in a 3DP introductory workshop (independent variable).

Table I: The DBR process

Step one: Evaluating the gap/need The identified problem defined the study's aims and objectives.
Step two: Developing the proposed intervention plan Initiating the development of an intervention to meet the objectives – introducing the therapists to 3DP technology. This step involved developing the intervention structure and mapping out potential content. Initially, the plan was to create a pre-recorded presentation for participants to be sent electronically. Following this initial plan, the structure of the presentation was outlined, mapping out areas of interest identified through the perusal of relevant literature. The structure included: • An introduction to 3DP • The history of 3DP • Orientation to the parts of the 3D printer • Materials used in 3DP and their properties • An introduction to CAD and open-source design sites • Applications in broader healthcare practice • Applications in occupational therapy practice Collaboration with relevant stakeholders determined that the presentation would be better delivered in- person, with a practical component, thus the plan for a 3DP introductory workshop.
Step three: Further developing the content of the presentation This involved the additional gathering of resources, such as journal articles, websites, reports, manuals, handouts, and video clips, to expand on each subsection of the abovementioned content. During this process, additional areas of interest were identified and included an introduction to various forms of manufacturing and different types of 3DP.
Step four: Collation and Synthesis This step aimed to funnel the acquired information, ensuring relevance and applicability. The information was synthesised and formatted in a handout and PowerPoint presentation. The feasibility and effectiveness of a PowerPoint presentation were then queried and altered. It was determined that a video presentation would be more appropriate to ensure consistency and standardisation across the various groups of participants. The actionable step was utilising available networks and sourcing a video creator and editor.
Step five: Creation and refinement of the video presentation and workshop content The video included animations, voiceovers, video clips, and music, to effectively present the information in a captivating and easy-to-understand manner. The first draft utilised the information synthesised in step four. The video presentation was divided into a theoretical section and a more practical one. The practical component included a combination of a pre-recorded presentation and real-time presentation, however, followed a structured format. This portion of the workshop included: • An introduction video. • A pre-recorded screen recording of the software and open-source websites in use. • Exposure to various examples of printed devices and splints. • Exposure to the types of materials used in printing. • Physical orientation to the parts of the printer. • Exposure to printers operating in real time. The video was then edited and formed the second draft, which was again critiqued and edited. The final video was utilised for each of the 4 workshops and pilot study. No alterations to the presentation were noted from the pilot study.

Setting: The study was located in KwaZulu-Natal, South Africa. South Africa has been described as both a developing and developed country, having high levels of inequality, juxtaposing wealthy neighbourhoods and poverty-stricken settlements[24-26]. South African healthcare expenditure aggregates to over R500 billion annually and is approximately evenly split between the public and private healthcare sectors, despite the former providing care for the large majority of the country[27]. Public facilities are, as a result, often overcrowded, have limited resources, long waiting times, and staff shortages[26]. A setting with two contrasting healthcare sectors required representation of both within the study.

The government is unable to meet a significant portion of the assistive technology needs within South Africa affecting the large majority accessing public healthcare, but in time also affecting the entire disabled population with the proposed implementation of National Health Insurance. One of the most significant challenges faced within this context, with the provision of products and services, is the financial constraints which directly impact resource availability, often resulting in extended waiting times. Waiting times of over two years have been reported, with devices no longer suitable to the patient's needs, size, environment, and life roles that have changed[12].

Participant selection and sampling: Participants included practising occupational therapists in physical or paediatric rehabilitation in either the public or private healthcare sectors in KwaZulu-Natal. The database of the Occupational Therapy Association of South Africa (OTASA) was accessed to attain membership figures; however, membership with OTASA is not mandatory, and it is therefore expected that not all therapists are registered with the association.

Therefore, the total number of potential participants in the target population was consequently unknown. However, the number of public sector hospital departments invited to participate in the study was 28, and the number of private sector practices invited was approximately 50. In total, 40 therapists consented to participation and were involved in the study. Non-probability convenience sampling was utilised. Public sector therapists were accessed via the chairperson of the KZN provincial forum, who aided in the distribution of the invitation and detailed explanation of the research study via email to each department. Private practice therapists were invited via networking, occupational therapy messenger groups and practice searchers were conducted via the internet to extend the invitation.

Research tools: The study included a pre-test, post-test questionnaire based on the TAM. A portion of the questionnaire was obtained, with permission, from a previous study conducted in the United States of America that successfully developed a TAM-based questionnaire and utilised it to determine occupational therapy students' attitudes and perceptions of 3DP technology[28]. The questionnaire included 12 biographical questions; 13 questions based on the TAM (scored on a seven-point Likert scale ranging from one (totally disagree) to seven (totally agree), and ended with five open-ended questions. The biographical questions were to determine the therapists' experience in the field and with 3DP, their practice habits, and their age – creating an opportunity to generate further discussions of potential influences. The open-ended questions were developed by looking at the TAM categories, and were phrased to create space for further perspectives and opinions to provide depth to the first 13 questions scored on a Likert scale. The pre-test and post-test questionnaires were administered directly before and after the therapists participated in an introductory workshop.

Research procedure: Four workshops were conducted with four different groups of therapists. The workshops were held at various settings (a public hospital, a private hospital, a private practice, and at a tertiary institution's occupational therapy department). Locations were chosen based on ease of access for therapists living in the Pietermaritzburg area, the Upper Highway area, North Coast and Westville Central area, and therapists were given a choice as to which workshop to attend. The workshops were run by the researcher and a co-facilitator and attended by the research supervisors (all of whom comprise the collaborators involved in the DBR process that produced the workshop content). Each workshop was 2.5 hours in length (including arrival and refreshments). The workshops spanned several weeks. At the start of the workshop, therapists completed the pre-test questionnaire; they then engaged in the presentation and practical components of learning before completing the post-test questionnaire. Questionnaires were collected at the end of the workshop, each therapist's pre and post-test responses were stapled together, enabling direct comparison of changes in responses.

Data analysis: The quantitative data collected from the pre- and post-test questionnaires were captured on a Microsoft Excel spreadsheet and were prepared for analysis using the IBM Statistical Package for Social Sciences (SPSS, Version 24.0). The data were analysed descriptively and collated using frequencies and means. The pre and post-test results from the 13 TAM-related questions were scored according to the four categories of the TAM including perceived usefulness, perceived ease of use, attitude towards use and intention to use. Paired t-tests were used to analyse the responses and compare the mean measurement taken from the pre- and post-test response[29]. Cohen's d was then used to calculate the effect sizes between the pre- and post-test responses[30]. The results were interpreted according to small, medium, and large effect. Results were then collated for representation in tabular format. Non-parametric tests could have been used and suitable, given the small sample size; however, a parametric test is often more likely to detect a significant difference when it exists and therefore paired t-tests were used[31]. The demographic questions were grouped, translated into quantifiable data, and represented in tabular format. The five open-ended questions in the survey were grouped by question and captured onto Microsoft Word.

The data were manually coded and thematically analysed using a deductive approach. The themes were predetermined and utilised in analysing both the pre- and post-test responses: 1) Perceived usefulness of the technology in practice, 2) Perceived ease of use of the technology system, 3) Attitude towards 3DP and the incorporation of the technology in practice, 4) Perceived accessibility of the technology system. The TAM informed the first three themes, whilst the last theme was informed by the review of literature throughout the research process, in combination with the experiential insight of living in a developing context. The specific subthemes were not determined deductively and were determined through the review, grouping and analysis of responses from the five open-ended questions.

Scientific rigour

Trustworthiness was ensured through replicability, transferability, confirmability, and triangulation. The detailed documentation of the following ensured replicability: the participants, the data collection tools and methods, the data collection process, and data analysis. The detailed record keeping of each step of the process will enable each step to be accurately repeated[32]. Transferability was ensured by providing sufficient detailed description of the study, so that readers can determine for themselves whether the findings are applicable to themselves in their own context[33]. Confirmability was established as three authors were privy to the raw data, were involved in the data analysis, and reviewed the discussions and conclusions drawn from this. Triangulation was achieved by converging multiple data sources, and the findings from this study are available for review by other professionals and experts in the field, enabling analyst triangulation[34].

Ethical considerations

Ethical clearance was obtained from the Biomedical Research Ethics Committee (BREC) prior to the commencement of

Table II: Demographics and practice/ experience profile of therapists

Characteristic		**M (SD)**
Age of Participants		31.63 (8.62)
Years of Experience		8. 22 (8.65)
Characteristic		**n (%)**
Gender	*Female* *Male*	38 (95.0) 2 (5.0)
Sector of Practice	*Public* *Private*	19 (47.5) 21 (52.5)
Computer Literacy		40 (100)
Experience with 3DP	*None* *Novice* *Intermediate* *Expert*	38 (95.0) 2 (5.0) 0 (0) 0 (0)
Frequency of Splinting	*Daily* *Several times a week* *Once a week* *Several times a month* *Seldom* *Never*	13 (32.5) 5 (12.5) 1 (2.5) 9 (22.5) 10 (25.0) 2 (5.0)
Tendency to Fabricate or Purchase Commercial Splints	*Fabricate Splints* *Commercial splints* *Both* *Neither – refer*	34 (85.0) 0 (0) 3 (7.5) 3 (7.5)
Frequency of issuing Assistive Devices	*Daily* *Several times a week* *Once a week* *Several times a month* *Seldom* *Never*	1 (2.5) 1 (2.5) 0 (0) 13 (32.5) 23 (57.5) 2 (5.0)
Tendency to Fabricate or Purchase Commercial Assistive Devices	*Fabricate* *Commercial assistive devices* *Both* *Refer on/ or no response*	18 (45.0) 18 (45.0) 2 (5.0) 5 (5.0)

the study (Reference number: BREC/00003938/2022). Gatekeeper permission was obtained from the Department of Health, for therapists working within the public sector (NHRD reference: KZ_202201_024). In order to ensure informed consent and confidentiality within the study, the following was ensured: Interested participants were provided with a written detailed description of the research purpose and process, prior to involvement in the study. Participants were informed of the research procedure, its purpose, possible risks and benefits, the selection process, the knowledge that they can withdraw from the study at any time, and additionally were given an opportunity to ask questions before accepting the invite to join the study. Throughout the research process, all information obtained from the data collection tools did not contain identifying data. 3D printers were used throughout this research study; the printers are the property of the University of KwaZulu-Natal, and permission to utilise the equipment as students was granted.

RESULTS

Quantitative results

Demographics

The demographic profile of the study participants is highlighted in Table II (above). The study included 40 occupational therapists, the majority of whom are females, with the age of the participants ranging from 22 to 54 years, (M = 31.63; SD = 8.62). The experience amongst the therapists ranged from 0 years (currently completing community service) to 33 years (M =8.22, SD = 8.65). The study comprised a nearly equal distribution of therapists working within the public (47.5%,) and private (52.5%,) healthcare sectors. All participants were computer literate, and 95% had no prior experience with 3DP. The therapist's practice profiles indicated the majority (32.5%) splinted daily, 22.5% splinted several times a month, and 25.0% seldomly splinted. 85.0% of therapists manually fabricate splints/ orthotics, rather than purchasing a commercial product. Assistive devices are seldom issued by 57.5% of therapists while 32.5% issue them several times a month. The tendency to fabricate (45%) or purchase commercial (45%) assistive devices was equally distributed amongst the therapists.

Table III (page 9) highlights the changes between the pre- and post-intervention responses. The questionnaires consisted of 13 questions across the four categories of the TAM. Of the 13 questions, 11 depicted a significant change ($p < 0.05$) between the pre- and post-test responses. In terms of the magnitude of change, four questions depicted a small effect size ($0.2 \geq d \leq 0.5$), 7 depicted a medium effect size ($0.5 \geq d \leq 0.8$), and 2 depicted a large effect size ($d \geq 0.8$). The effect size is the most significant outcome of empirical studies, as it depicts whether an intervention has caused an effect, and the magnitude of the effect[35].

Table III: Significance and effect size of each question

TAM Category	Question	Response Mean (Standard Deviation)		p value	Cohen's d	Effect size
		Pre-test	Post-test			
Perceived usefulness	I think that using 3D printers would improve job quality for Occupational Therapists.	5.30 (1.159)	5.80 (0.791)	0.000	0.520	Medium
	I think that using 3D printers would improve the effectiveness of how Occupational Therapists deliver services to patients.	5.33 (1.118)	5.88 (0.883)	0.016	0.486	Small
	I think that the advantages of using 3D printers outweigh the disadvantages.	4.70 (0.992)	5.53 (1.037)	0.001	0.817	Large
	Overall, I think that using 3D printers is advantageous for Occupational Therapists.	5.05 (1.600)	5.78 (0.974)	0.582	0.403	Small
Perceived ease of use	Learning to work with 3D printers (will be/is) easy.	4.05 (1.108)	5.00 (0.961)	0.005	0.857	Large
	I think that learning how to use the software and printers (will be/is) clear and understandable.	4.18 (0.984)	4.98 (0.947)	0.007	0.767	Medium
	I think it (will be/is) easy for Occupational Therapists to become skilful at using 3D printers.	4.80 (1.203)	5.20 (0.911)	0.065	0.313	Small
	I think that it is possible to use 3D printers without expert help.	3.83 (1.567)	4.75 (1.214)	0.003	0.628	Medium
	Overall, I think using 3D printers (will be/is) easy for Occupational Therapists.	4.43 (1.152)	5.15 (1.027)	0.001	0.654	Medium
Attitude toward using	I think that using 3D printers is a good idea for Occupational Therapists.	5.53 (0.933)	6.03 (0.698)	0.035	0.520	Medium
	As an Occupational Therapist, I like the idea of using 3D printers.	5.55 (1.037)	6.10 (0.778)	0.001	0.590	Medium
Intention to use	In the future, if 3D printer resources are available to me in my Occupational Therapy practice setting, I will probably use 3D printers.	5.68 (1.118)	6.10 (0.810)	0.000	0.504	Medium
	I will recommend the use of 3D printers to other Occupational Therapists.	5.30 (1.224)	5.73 (0.933)	0.000	0.411	Small

According to the TAM, the first three categories need to be favourable before the intention to use the technology is influenced.[8] The categories, perceived usefulness, perceived ease of use, and attitude toward using all presented with a significant difference of $p<0.05$ from pre-test to post-test, and medium effect sizes between 0.5 to 0.7. Therefore, the fourth category, intention to use, would also depict a significant change when comparing the pre and post-test responses. The score difference for intention to use was highly significant ($p= 0.0$), but the medium effect size ($d= 0.518$) was the lowest for all categories, indicating a lower clinical change.

Qualitative Findings: Pre-test

Participants answered five open-ended questions relating to 3DP technology and integrating the technology system into practice, in the pre and post-test questionnaires. Table V (page 10) shows a summary of the themes.

Pre-test Theme 1: Perceived usefulness of the technology in practice

Advantages

Some participants perceived the technology as being useful for its applications in splinting and assistive device production. Their perceptions were geared towards the customisation and individualisation of splints and assistive devices. Precision, accuracy and reduced human error were noted. Participants acknowledged that 3DP may produce neater, more aesthetically pleasing end products and promote time-efficiency in the fabrication process of assistive devices when compared to manual fabrication or procurement. Despite previous concerns regarding the expense and financial outlay for 3DP, several participants noted that it may be cost–effective in the long run.

> "Allows OTs to make splints without hurting a patient or disrupting a repair, it is neater/cleaner, reduces stress on OTs to be perfect. **(P19 – 28yrs, public practitioner)**

> "Better cosmetic outcome; possibly lower profile designs." **(P27 – 36yrs, private practitioner)**

Disadvantages

Participants perceived the technology as being disadvantageous for two primary reasons; the extended time required to print items and the perceived inability to

Table IV: TAM Category significance and effect size

	Response Mean (Standard Deviation)		Mean difference (MD)	Standard deviation (SD)	P Value (Significance)	Cohen's d	Effect size
TAM Category	**Pre- test**	**Post-test**					
Perceived usefulness	20.38 (3.72)	22. 98 (6.06)	-2.60	3.73	0.011	0.693	Medium
Perceived Ease of use	21.28 (4.98)	25.08 (4.07)	-3.80	5.14	0.019	0.739	Medium
Attitude towards using	11.08 (1.89)	12.13 (1.40)	-1.05	1.83	0.008	0.574	Medium
Intention to use	10.98 (2.18)	11.82 (1.62)	-0.85	1.64	0.000	0.518	Medium

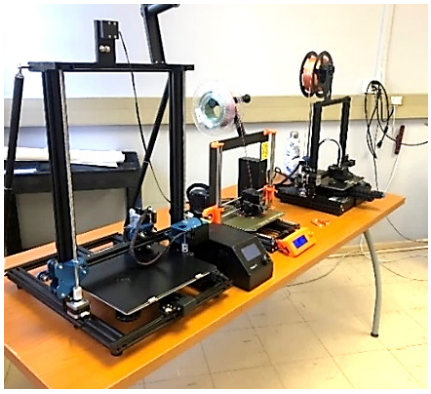


Figure 2: Printers setup for a workshop.

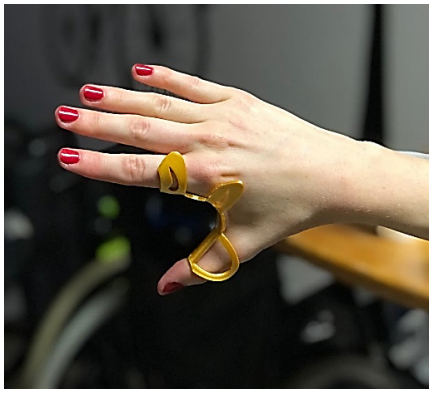


Figure 3: Splint printed from an open-source site.

Figure 4: One-handed shoe clip printed from an open-source site.

remould items. It was explicitly noted that a rapid turnaround time is essential in public settings with high patient loads. Participants also noted the concern regarding the ability to adjust and alter the items once printed, as in manual fabrication. The concern was centred around the need for alterations, specifically in the splinting process, to ensure comfort and to meet the patient's individualised needs with their specific condition/ diagnosis.

> "I feel that the time it takes to print objects may be a challenge as you may not be able to issue a device on the spot." **(P14 – 36yrs, public practitioner).**

> "Fabricating according to individual diagnosis/needs of patient /fit assists with comfort. Not sure if the 3D splint will be comfortable as it isn't individually moulded? Or is it?" **(P24 – 31yrs, public practitioner).**

Pre-test Theme 2: Perceived ease of use of the technology system

Simple/ easy

A minority of participants felt that operating the printer and its accompanying software would not be difficult despite the initial training requirement.

> "Ease of use might prove to be less of a problem specifically regarding younger occupational therapists familiar with newer technology." **(P39 – 23yrs, public practitioner).**

Difficult/ requires expertise

The majority of participants perceived the technology as requiring expert training to operate. Many indicated that they felt the technology would be complex, require expertise, and be time-consuming to learn how to use proficiently.

> "Probably needs a dedicated OT who can be consulted to assist." **(P18 – 23yrs, private practitioner).**

> "Training and understanding of staff, e.g., maybe one staff is trained but when he/ she leaves there is no handover to the next therapist." **(P28 – 35yrs, public practitioner).**

Willingness to learn and adopt a new skill

The willingness of therapists to learn a new skill was also queried by several participants, noting that therapists may be resistant to change.

> "New technology makes me slightly uneasy in terms of learning to use, therefore, I am sure others would be apprehensive but willing to learn to use it." **(P21 – 31yrs, private practitioner).**

Pre-test Theme 3: Attitude towards 3DP and the incorporation of the technology in practice

Novice

Many participants reported having limited to no prior knowledge or experience in 3DP technology, nor an

Table V: Summary of themes and subthemes

Pre-test Themes	Subthemes	Post-test Themes	Subthemes
Perceived usefulness of the technology in practice	Advantages Disadvantages	Perceived usefulness of the technology in practice	Advantages Disadvantages
Perceived ease of use of the technology system	Simple/ easy Difficult/ requires expertise Willingness to learn and adopt a new skill	Perceived ease of use of the technology system	Simple/ easy Difficult/ requires expertise Driving force; passionate therapists to drive 3DP forward in the profession
Attitude towards 3DP and the incorporation of the technology in practice	Novice Advancements Traditional practice, fear of automation and loss of scope of practice	Attitude towards 3DP and the incorporation of the technology in practice Following exposure to 3DP	Advancements Traditional practice and concern regarding gatekeeping
Perceived accessibility of the technology system	Expense Context Maintenance; updates, repairs, technical support, replacements	Perceived accessibility of the technology system	Expense Context Maintenance

understanding of how it works or could potentially be applied in practice settings. As a result of limited insight, several participants did not report strong opinions (or any opinion) of the technology system and waited until after the presentation to formulate an opinion.

> "I have very limited understanding. I had not heard of this concept prior. I only knew of commercial splints and assistive devices." **(P40 – 27yrs, public practitioner).**

Advancements

Certain participants acknowledged the technological direction in which the world is advancing and felt that 3DP would be a useful resource with an application in occupational therapy practice. They expressed excitement and optimism towards incorporating the technology in practice, perceiving it as a tool to enhance therapists' skills and remain relevant.

> "Think it should be part of therapeutic media in undergrad training. It's a no brainer." **(P26 – 51yrs, private practitioner).**

> "Occupational therapists are usually old school and not trend setters. It is important to stay up to date with technology relevant to our field. To incorporate technology in order not to become outdated". **(P27).**

Traditional practice, fear of automation and loss of scope of practice

Several participants raised concerns about job security; fear of automation and other disciplines encroaching on occupational therapy practice. They also raised concern of extracting from core occupational therapy skill sets and specialities; affecting the therapeutic relationship with a patient, and removing the ability to be hands-on with a patient.

> "I am concerned it may "rule out" the role of an OT in splinting as doctors may be able to 3D print splints themselves therefore reduce the no. of specialists required for an injury." **(P31 – 27yrs, private practitioner).**

Pre-test Theme 4 : Perceived accessibility of the technology system

Expense

A resounding perception of inaccessibility was evident, specifically due to the perception of the technology being highly costly to purchase. Participants noted that the technology would be especially inaccessible in the public healthcare sector, due to limited budgets and the structuring of the healthcare system.

> "I feel it does have a place and can be very beneficial, however it is probably something that you might only see in a tertiary hospital or private setting and not in other settings." **(P38 – 23yrs, public practitioner).**

Context

Participants were concerned about the practicality and effectiveness of operating a 3D printer instead of manual labour. The technology requires electricity, which raises concerns within South Africa, as all are accustomed to regular power outages and load-shedding.

> "In government settings we can barely access AFOs, wheelchairs, slings etcetera which are small things - the country does not even have electricity, so accessibility on technology within this setting is extremely limited". **(P19).**

Maintenance: updates, repairs, technical support, replacements

Repeatedly participants raised concerns regarding the practicality and feasibility of utilising a technology that will require maintenance, repairs, servicing and replacement of

broken parts. Regular updating of the software programme to operate the system was also reported, with the above concerns further highlighted as significantly problematic in the public healthcare sector due to limited funding and resources.

> "If it broke in the public sector, it wouldn't be serviced or repaired/replaced easily due to poor funding." **(P24 – 31yrs, public practitioner).**

Qualitative Findings: Post-test

Following exposure to 3DP participants reported having a clearer understanding of what 3DP is, what the technology system entails, the printing process and the actual and potential applications for practice.

Post-test Theme 1: Perceived usefulness of the technology in practice

Advantages

Participants' perceptions were geared towards the technology being beneficial in ensuring accuracy and exact specifications, individualisation, and producing aesthetically pleasing, durable and lightweight items. Participants noted that the benefits listed would cultivate patient compliance and satisfaction. Notably, the participants perceived the technology as being far more beneficial in the production of assistive devices than splints, specifically due to the extended time requirements for printing and patients generally requiring splints to be fitted and issued immediately. Participants appreciated the allowance for creativity, creating a wide variety of items, and especially manufacturing items that are not usually easily accessible.

> "It is a technology that our profession needs as we always make customised devices. Also beneficial to our patients who are more active and will require devices that will not limit them e.g. Weight." **(P13 – 27yrs, public practitioner)**.

Disadvantages

Participants raised apprehension regarding the feasibility of using the 3D printer in practice due to the long print times, thus preventing fitting and issuing of splints and assistive devices during the session, delaying service delivery. Participants also noted, that even though open source design sites are available for use, they are not occupational therapy specific, and therefore may not be appropriate.

> "I think it has its role. However, when you are making 12 splints in a day that need to be individualised with tight time constraints, I don't think the printer would be easy to use under pressure." **(P24)**.

Post-test Theme 2: Perceived ease of use of the technology system

Simple/ easy

The majority of participants reported a changed perception in admitting that operating the printer and its software seemed far less complex and daunting than they initially thought. The participants agreed that training would be required but would be user-friendly and easy to grasp.

> "More accessible and a lot easier to use than I thought it would be. Would now definitely consider buying one in the future." **(P34 – 32yrs, private practitioner)**.

Difficult/ requires expertise

Several participants felt that the technology system would be difficult to grasp even with training. They concluded that the ease of use would depend on the individual therapist's skills and technological proficiency. Some participants specifically felt that the designing process would prove to be difficult in learning how to operate the software, and specifically due to the perceptual demands of the design process.

> "I might struggle with CAD design as dimensions and shapes might get confusing." **(P11 – 27yrs, private practitioner)**.

Driving force; passionate therapists to drive 3DP forwards in the profession

In their post-test responses, a few participants expressed the need for several therapists to take ownership and take charge of this potential 'field' to drive the process and avail themselves as consultants.

> "Need to actually have OTs working at designing and testing. Need OTs to actually put in the effort with development in order for it to be used successfully in the general OT practice/ setting in RSA." **(P18)**.

Post-test Theme 3: Attitude towards 3DP and the incorporation of the technology in practice

Advancements

The majority of participants expressed excitement at the possibility of incorporating 3DP into practice, growing and evolving as a profession with technology. They viewed the technology system as something innovative with broad applications that will enhance intervention and complement the skills occupational therapists are equipped with.

> "Wow - the possibilities are endless!' Really, really interested! Can't believe all the options available." **(P28).** "The need for more education and research is apparent and I think it should be encouraged to help keep OTs on the forefront." **(P36 – 36yrs, private practitioner).**

Traditional practice and concern regarding gatekeeping

Several participants still raised concerns about job security. However, this time more also raised concerns about the technology, and specifically open-source platforms being available to other professions and the public – enabling anyone to print aids and splints, posing a serious safety concern as clinical reasoning will not be applied.

> "The disadvantage is that there is no clear sort of gatekeeping to protect our role and clearly define OTs

> as key fabricators for assistive devices and splints, if the software can be used by anyone, which impacts our role in device/ splint fabrication." **(P40)**.

Post-test Theme 4: Perceived accessibility of the technology system

Expense

Many participants admitted that the cost and accessibility were far less of a barrier than they assumed. Although an initial outlay is required to purchase the printer, they felt that it would result in cost-effectiveness in the long run as the materials are inexpensive.

> "More positive about the prospect now, the financial implications are not as daunting and the fact that open source provides so many options is encouraging." **(P36).**

Several participants expressed that the cost of the technology system would still be a barrier and result in reduced accessibility. Specifically, in the public sector, the outlay of finances for a printer would not take priority considering the lack of resources.

> "The accessibility problems within our context would still limit what types of facilities could use this technology." **(P38)**.

Context

Participants perceived load-shedding and limited internet access in some areas as problematic, as electricity is required to operate the printer and the internet is necessary in utilising open-source sites or computer-aided design software.

> "Loadshedding is a nightmare! But we have generators in our hospital so that wouldn't be a problem for me personally." **(P28).**

Maintenance

Maintenance concerns did not surface as frequently compared to the pre-test responses. However, participants still raised concerns regarding repair, troubleshooting, technological support, and upgrading the technology system.

> "Technology becomes quickly outdated- constant need to upgrade printer." **(P5 – 37yrs, public practitioner)**.

DISCUSSION

Within the field of occupational therapy, the global literature and applications of 3DP in practice are rapidly growing, revealing a paucity of South African-specific literature. This study, which is the first to the author's knowledge, aimed to determine the perceived acceptance of 3DP technology by occupational therapists, and to further determine whether the therapists' perception of the technology would be altered from exposure to the technology in the form of an introductory workshop.

A total of 40 therapists participated in the study, including male and female participants, with the age range spanning from 22 to 54 years, and their years of experience ranging from 0 years (currently completing community service) to 33 years. There was a balanced representation of therapists working in public and private practice. Therapists that were a part of the research study attended a 3DP workshop and completed a questionnaire based on the Technology Acceptance Model (TAM), before and after exposure to the technology during the workshop. The TAM portrays that a user's attitude towards a technology system is a pivotal determinant of whether the user will accept or reject the technology. The attitude is influenced by two crucial factors, 'perceived usefulness' and 'perceived ease of use'[8]. In addition to the categories of the original TAM, an additional dominant influential factor emerged; 'perceived accessibility'.

Perceived usefulness

Perceived usefulness is the extent to which an individual believes that their performance or role would be enhanced by using a specific technology[19]. The therapists held the perception that the technology cultivates therapist creativity, enables the broad creation of items, customisation, precision, reduced human error, and creation of an end product that is aesthetically pleasing; both prior to and post-exposure to the technology. However, although the therapists had positive perceptions of the technology prior to exposure, it was noted that the positive perceptions increased following exposure. Exposure to the technology caused a medium effect size, further solidifying their original perception of the usefulness of the technology system. A significant difference, however, between the pre- and post-exposure perception of usefulness was that most therapists felt that the technology would be better suited to producing assistive devices, rather than splints. Many of the therapists' splint on a daily/ weekly basis (47.5%). Unlike assistive devices with the primary goal of aiding function, splints can also be prescribed as an adjunct to medical intervention; they can be used to stabilise, immobilise and prevent injury or deformity[36]. As a result, a splint is generally issued within the session. For this reason, many therapists perceived the technology as inappropriate as a means of splint fabrication because 3DP can require extended printing times. An article by Willet[37] states that the printer's type or specification will also determine its use. For example, there are entry level, hobbyist, enthusiast, professional, and industrial–level printers, which will vary in printing speed, quality of printing and complexity. Printing times depend on the print settings, for example; print density, layer height, and the requirement for structural support. Therefore, suitability is more so task and item-specific.

Perceived ease of use

Perceived ease of use can be described as the degree to which an individual is of the opinion that using/ operating a specific technology system would not require significant mental effort or physical exertion[19]. Perceived ease of use was explored by looking at whether therapists perceived the technology system (hardware and software) as easy to learn, whether they felt they could become proficient and

skilful in using the technology, and whether they believed it would require expert training. This category displayed a medium effect size between pre and post-test responses. However, of significance was the large effect size in the change of perception as to whether the therapists perceived that learning to operate the technology proficiently would be easy. Initially, most therapists perceived the technology as requiring expert training, knowledge, and skill to operate. After exposure to the technology, there was a significant shift towards perceiving proficiency as attainable and within reach. Existing literature examining individuals' perceptions of ease of use of technology, shows that an individual's perceptions significantly depend on their perceived general technology self-efficacy[38]. Self-efficacy is a person's belief in his/ her capability to perform a particular task successfully and is one of the most powerful volitional predictors of how well a person performs[39]. Computer self-efficacy refers to one's confidence in learning, understanding and proficiently operating a new technology[40]. Research has shown that an individual's technological self-efficacy is a significant determinant of perceived ease of use[38]. All of the participants had minimal to no prior experience or knowledge of 3DP, after exposure, however, their perception of their ability to navigate and operate the technology was altered. These findings are validated by Research that has found that increased insight into a technology system correlates with reduced technology-related anxiety and increased interest in the technology[41].

Attitude

In the study, 38 of the 40 participants reported no prior experience with 3DP and two reported that they were novices. As a result, having limited to no prior knowledge or experience in 3DP technology, nor an understanding of how it works or could potentially be applied in practice settings, many therapists did not initially report strong opinions/ feelings (or any opinion/ feeling) towards the technology system. However, despite their lack of experience, others formulated an opinion and acknowledged the technological direction in which the world is advancing and felt that 3DP might be a useful resource in occupational therapy practice. Following exposure to the technology system, therapists reported having a clearer understanding of what 3DP is, what the technology system entails, the printing process and the actual and potential applications in practice. Afterwards, most therapists expressed positivity towards the technology system (not discounting their concerns), viewing it as something innovative with broad applications that will enhance intervention and complement the skills occupational therapists' are already equipped with. These findings corroborate with a study by Holzinger, Searle, and Wernbacher[42], where they depicted acceptance based on previous exposure to a technology system.

Several therapists raised concerns centred around job security, specifically due to the concern of automation. However, in an Oxford University study[43], 702 common occupations were examined, and their risk of automation was analysed and compared. Occupational therapy only scored 0.35% risk of automatic. Despite continual technological advancements, occupational therapy is not at risk of automation as it requires continual creativity, complex relational interactions and is highly unpredictable and vast. Technology can however change how therapists provide services[7]. A frequent concern was centred around losing or extracting from core occupational therapy skill sets and specialities; worrying that using a technology system instead of hands-on labour might affect the therapeutic relationship with the patient. An additional concern was centred around the open-source platforms. It was admitted that open-source platforms would prove to be highly advantageous in providing a global sharing of designs and knowledge; however, these resources would also be accessible to other professions and the general public. This raised the concern of other healthcare disciplines encroaching on occupational therapy practice, but even more so the concern of the general public accessing open-source sites, posing a serious safety risk because clinical reasoning would not be applied. These concerns corroborate with an article by Vogels, Rainie, and Anderson[44], which unpacks the uses of technology. The article states that the determinant of technology's impact, is how technology is used, who uses it, and what it is used for. Technology can be highly advantageous as easily as it can be detrimental to society; it depends entirely on the user.

Perceived accessibility

External variables are essentially a variety of variables that are expected to influence users' technology acceptance and adoption. These factors include environmental factors, political factors, personal characteristics, organisational factors, etcetera[45]. External variables emerged as a dominant feature, specifically accessibility and feasibility within the South African context. Initially, the majority therapists perceived the technology as being 'out of reach,' and financially inaccessible. Post-exposure, majority of therapists reported that the technology was far more financially accessible than they initially thought, and more accessible in the south African context than they originally thought. The feasibility, however, of procuring a printer in the public healthcare system was still raised as an apprehension due to the financial and resource constraints within the system.

Additionally, what did not change was the queried feasibility of the technology; using a system that requires electricity to perform an essential service in a country accustomed to frequent power outages. Eskom is South Africa's dominant electricity supplier but is frequently unable to meet the electrical demands of the country, resulting in the implementation of 'Loadshedding,' a staged approach to power outages with the purpose of conservation. While private facilities and frequently secondary/ tertiary-level public hospitals are equipped with generators, smaller hospitals and clinics are often left in the dark[46].

CONCLUSION

The study's findings reveal that engaging therapists in a workshop introducing them to the concept of 3DP at an introductory level, brings about a change in the therapists' perception of the technology system. Exposure to 3DP resulted in improved perception of the technology's

usefulness, ease of use and attitude towards it, impacting their reported intention to use the technology in future practice. Table VI (page 16) shows a summary of the advantages and disadvantages of 3DP in occupational therapy practice.

Apprehensions

Open source sites and technology system use cannot be monitored or controlled. This is true with everything. In an article by Vogels et al[44], the benefits and risks of technology advancements are discussed; what was noted is that from the beginning of time advancements have been two-fold. Fire, for example, can be used to cook just as easily as it can be used for destruction. The same is true for technology, it is neither inherently good nor bad, but entirely dependent on the user and how it is wielded. The occupational therapist's role is to ensure it is wielded for good. Several therapists have raised concerns about other disciplines encroaching on occupational therapy practice. However, despite the vast advancements in 3DP globally, South Africa is still at the exploratory phase, the profession therefore has the opportunity to take ownership and run with it, enabling the profession to evolve with technology and remain relevant, keeping occupational therapy at the forefront.

Recommendations

If the barriers to clinician uptake are overcome, the negative perceptions towards 3DP technology in occupational therapy practice may be mitigated, resulting in easier uptake and utility. The following recommendations would aid clinician uptake and overcoming of certain barriers.

3DP workshops

It is recommended that beginner, intermediate and advanced 3DP training courses are initiated, enabling upskilling of therapists. The courses should be geared towards incorporating theory and practice, enabling practical skills training.

Partnership and mentorship

It would benefit healthcare professionals to extend themselves beyond working in silos, and instead share resources, experience, and knowledge in 3DP. 3DP 'hubs' can be created for the sharing of resources. Smaller, poorly resourced clinics and hospitals should partner with better-resourced tertiary hospitals, and private practitioners should group together, pooling resources. To note, private and tertiary hospitals are equipped with generators[46]. Key therapists should be appointed as the point of call within each district, enabling mentorship and guidance.

Partnership with engineers utilising 3DP would be beneficial to enhance the applications and use of the technology system and guide troubleshooting, repairs, and maintenance.

Education

3DP should be incorporated into the occupational therapy undergraduate curriculum, together with continued studies on evolving technological advancements, ensuring the professions continual advancement is stimulated at a foundational level.

Resource pool

Occupational therapists need to be designing and uploading products onto open source sites such as Thingiverse, thus growing the profession-specific pool of resources.

During courses, therapists should be engaged in case studies that require practical designing of items, these can then be saved and uploaded to open source sites, contributing to resources.

Job security and conventional practices

As a profession, occupational therapists can also vouch for policy implementation, protecting the role of assistive devices and splint fabrication.

To combat the concern of extracting from core occupational therapy skill sets and specialities, coursework should include practical patient care, utilising the technology. This would enable therapists to determine whether the therapeutic relationship with a patient is affected due to the incorporation of the technology, and provide practice in navigating a new dynamic.

Limitations

Limitations to the study are multi-faceted. Firstly, the sample of participants was limited due to accessibility. For therapists to participate in the study they had to attend the in-person workshop, which limited the number of therapists as most of the therapists who did attend live in and around the eThekwini and uMgungundlovu districts, where the workshops were held. Secondly, the sample was also further limited by therapist's availability and willingness to participate in a two-hour in-person workshop. Although lack of interest cannot be assumed, the limited response and enthusiasm for the topic of 3DP may be indicative of such. Lastly, although the study is striving to ensure generalisability through the sample accurately portraying the population it represents, the study is limited to KwaZulu-Natal and therefore inevitably, it cannot be assumed that it will accurately represent the population outside of this region.

Author Contributions

Shelley Louise Barter was a Masters of Occupational Therapy student who contributed to the design, and was involved in the data collection, data analysis and writing up of this study. Alexander Jean Williams (Masters of Occupational Therapy candidate) and Pragashnie Govender were involved in the initial conceptualisation of the larger study on 3DP. Alexander Jean Williams assisted in the data collection for this study. Pragashnie Govender, Gina Rencken and Nonjabulo Ndaba were supervisors of the study and contributed to the design, provided supervision during the data collection process, and provided critique of the manuscript and assisted in revision of the manuscript for publication.

Conflicts of Interest

The authors have no conflict of interest to declare.

Table VI: Summary of 3DP advantages and disadvantages in occupational therapy practice

Advantages	Disadvantages
• Ensuring the profession evolves with technology and remains relevant, keeping occupational therapy at the forefront. • Allows for creativity and the production of innovative items. • Enables accuracy and precision of items fabricated. • Enables customisation and individualisation to the exact specifications of the patient and opens doors to vast problem- solving to meet each patient's specific needs. • The material is more cost effective than conventional materials, and provides increased variety of materials. • Products are aesthetically pleasing, can be lower profile and lighter weight, ultimately improving patient compliance. • A broad spectrum of items that are not easily accessible, affordable, or not even available can be fabricated - the convenience of being able to make rather than having to source. • Access to open-source sites allows access to ideas and blueprints globally, enabling a vast pool of resources. • Ability to design and fabricate without touching the patient; reducing pain, and preventing disruption of a repair etcetera. • The patient can see and visualise the end product during the design process, allowing opportunity for input prior to printing, contributing to reduced wastage. • Reduced manual labour.	• The printer's initial cost would make it especially difficult to procure in a public setting. • Extended print times (Depending on the size, complexity, and density of the item being printed). • Requirement for electricity to operate, in a country accustomed to loadshedding/ power outages. • Need for training and continuous upskilling of new staff. • Concern regarding the availability of maintenance, repairs, assistance with troubleshooting, specifically in the public sector. • Technology will continue to evolve; therefore, the system and printers will require continual upgrading which requires continual financial outlay. • Due to the availability of open- source sites, correct, therapeutic use of the technology system is not guaranteed. • Occupational therapists' role of being the key fabricators of assistive devices and splints cannot be protected. • If there is an error or the machine malfunctions, printing might need to start from the beginning. • The design process requires perceptual proficiency, making designing difficult for those who struggle to work between 2D and 3D designs.

Acknowledgement

The authors would like to acknowledge Dr MO Ogunlana for his assistance in the quantitative data analysis

REFERENCES

1. Ishengoma FR, Mtaho AB. 3D printing: developing countries perspectives. International Journal of Computer Applications. 2014;104(11):30-4. doi: https:/doi.org/10.5120/18249-9329
2. Matias E, Rao B. 3D Printing: on its historical evolution and the implications for business. Portland International Conference on Management of Engineering and Technology (PICMET). 2015; (15)551-8. doi: https:/doi.org/10.1109/picmet.2015.7273052
3. Fitzpatrick A. Design of a patient specific 3D printed arm cast. KnE Engineering. 2017;2(2): 135-42. doi: https:/doi.org/10.18502/keg.v2i2.607
4. Dodziuk H. Applications of 3D printing in healthcare. Polish Journal of Cardio-thoracic Surgery. 2016;13(3):283-93. doi: https:/doi.org/10.5114/kitp.2016.62625
5. Yan Q, Dong H, Su J, Han J, Song B, Wei Q, et al. A review of 3D printing technology for medical applications. Engineering. 2018;4(5):729-42. doi: https:/doi.org/10.1016/j.eng.2018.07.021
6. Paterson A, Donnison E, Bibb R, Campbell I. Computer aided design to support fabrication of wrist splints using 3D printing: a feasibility study. Hand Therapy. 2014;19(4):102-13. doi: https:/doi.org/10.1177/1758998314544802
7. Liu L. Occupational therapy in the fourth industrial revolution. Canadian Journal of Occupational Therapy. 2018;85(4):272-83. doi: https:/doi.org/10.1177/0008417418815179
8. Chuttur M. Overview of the Technology Acceptance Model: origins, developments and future directions. Sprouts: Working Papers on Information Systems. 2009;9(37):1-22
9. Rensburg R. Healthcare in South Africa: how inequity is contributing to inefficiency. The Conversation Africa, Inc. 2021 [accessed 2022 Nov]. https:/theconversation.com/healthcare-in-south-africa-how-inequity-is-contributing-to-inefficiency-163753#:~:text=South%20Africa%20has%20a%20two-tiered%2C%20and%20highly%20-unequal%2C,insurance%2C%20and%20serves%20around%2027%25%20of%20the%20population.
10. Jejelaye A, Maseko L, Franzsen D. Occupational therapy services and perception of integration of these at primary healthcare level in South Africa. South African Journal of Occupational Therapy. 2019;49(3):46-53. doi: https:/doi.org/10.17159/2310-3833/2019/vol49n3a8
11. Buehler E, Branham S, Ali A, Chang JJ, Hofmann MK, Hurst A, Kane SK. Sharing is caring: assistive technology designs on Thingiverse. Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems. 2015;525-34. doi: https:/doi.org/10.1145/2702123.2702525
12. Visagie S, Scheffler E, Seymour N, Mji G. Assistive Technology Service Delivery in South Africa: Conceptualising a Systems Approach. South African Health Review. 2020;(1)120- 7. doi: https:/journals.co.za/doi/abs/10.10520/ejc-healthr-v2020-n1-a15
13. OECD. National Development Plan 2030: Our future-make it work. Executive Summary. 2012 [accessed 2022 October]. https:/www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf.
14. Hale L, Linley E, Kalaskar D. A digital workflow for design and fabrictaion of bespoke orthoses using 3D scanning and 3D printing, a patient- based case study. Scientific Reports. 2020;10(1). doi: https:/doi.org/10.1038/s41598-020-63937-1
15. Li J, Tanaka H. Rapid Customization system for 3D-printed splint using programmable modeling technique - a practical approach. 3D Printing in Medicine. 2018;4(1):5 doi: https:/doi.org/10.1186/s41205-018-0027-6
16. Davis CP. MedicineNet. 2021 [accessed 2022 October]. https:/www.medicinenet.com/assistive_device/definition.htm.
17. Day SJ, Riley SP. Utilising three-dimensional printing techniques when providing unique assistive devices: a case report. Prosthetics & Orthotics International. 2018;42(1):45-9. doi: https:/doi.org/10.1177/0309364617741776
18. Lee Y, Kozar KA, Larsen KRT. The Technology Acceptance Model: Past, Present, and Future. Communications of the Association for Information Systems. 2003;2:752-80. doi: https:/doi.org/10.17705/1CAIS.01250
19. Chen SC, Li SH, Li CY. Recent related Research in Technology

Acceptance Model: a literature review. Australian Journal of Business Management and Research. 2011;1(9): 124-7. doi: https:/doi.org/10.52283/nswrca.ajbmr.20110109a14
20. Vaezi H, Moonaghi HK, Golbaf R. Design-Based Research: definition, characteristics, application and challenges. Journal of Education in Black Sea Region. 2019;5(1):26-35. doi: https:/doi.org/10.31578/jebs.v5i1.185
21. Scott EE, Wenderoth MP, Doherty JH. Design-Based Research: a methodology to extend and enrich biology education. CBE—Life Sciences Education. 2020;19(3):1-12. doi: https:/doi.org/10.1187/cbe.19-11-0245
22. Ford C, McNally D, Ford K. Using Design- Based Research in higher education innovation. Online Learning. 2017;21(3):50-67. doi: https:/doi.org/10.24059/olj.v21i3.1232
23. Armstrong M, Dopp C, Welsh J. Students' guide to learning design and Research. 2018 [accessed 2022 October]. https:/edtechbooks.org/studentguide
24. Naumann E. Perspectives on Africa's trade and integration. TralacBlog. 2020 [accessed 2022 October]. https:/www.tralac.org/blog/article/14567-south-africa-s-new-status-as-a-developed-country-for-purposes-of-united-states-subsidies-and-countervailing-duty-investigations.html.
25. The World Bank Group. The World Bank in South Africa. 2021 [accessed 2022 October]. https:/www.worldbank.org/en/country/southafrica/overview
26. Young M. Western Michigan University - Scholarworks@WMU. 2016 [accessed 2022 November]. https:/scholarworks.wmich.edu/honors_theses/2741.
27. Phillips G. Who owns whom. Africa Business Information. 2022 [accessed 2022 November]. https:/www.whoownswhom.co.za/report-store/healthcare-sector-south-africa-2022/.
28. Benham S, San S. Student technology acceptance of 3D printing in occupational therapy education. American Journal of Occupational Therapy. 2020;74(3):1-7. doi: https:/doi.org/10.5014/ajot.2020.035402
29. Shek DT, Zhu X. Pretest–posttest designs. In B. Frey (Ed.), The SAGE EncyclopediaEncyclopedia of Educational Research, Measurement, and Evaluation. SAGE Publications, Inc. 2018:1293-5 doi: https:/dx.doi.org/10.4135/9781506326139.n538
30. Piasta SB, Justice IM. Encyclopedia of Research Design. Salkind NJ, editor. SAGE Publications, Inc; 2010.181-85. doi: https:/dx.doi.org/10.4135/9781412961288
31. Campbell MJ, Swinscow TDV. Statistics at Square One. Wiley-Blackwell: BMJ. 2009; 11th(Ed).
32. Miceli S. Reproducibility and Replicability in Research. The National Academies In Focus, 2019 [accessed 2022 November]. https:/www.nationalacademies.org/news/2019/09/reproducibility-and-replicability-in-research#:~:text=Replicability%20means%20obtaining%20consistent%20results,about%20replicability%20are%20more-%20nuanced.
33. Brown JD. Characteristics of sound quantitative Research. Shiken. 2015;19(2):24-8.
34. Patton MQ. Qualitative Research & Evaluation Methods: Integrating Theory and Practice. 4th edition. California: SAGE Publications, Inc; 2015.
35. Lakens D. Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. Frontiers in Psychology. 2013;4(863):1-12. doi: https:/doi.org/10.3389/fpsyg.2013.00863
36. Egan M, Brosseau L, Farmer M, Ouimet M, Rees S, Tugwell P, et al. Splints and Orthosis for treating rheumatoid arthritis. Cochrane Database of Systematic Reviews. 2001;2010(7):1-5 . doi: https:/doi.org/10.1002/14651858.cd004018
37. Willett AK, 3D Printing and Occupational Therapy: The Process of 3D Printing Adaptive Devices. Eastern Kentucky University, Department of Occupational Science and Occupational Therapy. Honors Theses. 2019;654. https:/encompass.eku.edu/honors_theses/654
38. Venkatesh V, Davis FD. A Model of the antecedents of percieved ease of use: development and test. A Journal of the Decision Sciences Institute. 1996;27(3):451-81. doi: https:/doi.org/10.1111/j.1540-5915.1996.tb00860.x
39. Heslin PA, Klehe UC. Self- Efficacy. In S. G. Rogelberg (Ed.), Encyclopedia of Industrial and Organizational Psychology. 2006;(2):705-8.
40. Compeau D, Higgins C. Computer self-efficacy: development of a measure and initial test. MIS Quarterly. 1995;19(2):189-211. doi: https:/doi.org/10.2307/249688
41. Czaja SJ, Charness N, Fisk AD, Hertzog C, Nair SN, Rogers WA, et al. Factors Predicting the Use of Technology: Findings From the Center for Research and Education on Aging and Technology Enhancement (CREATE). Psychology and Aging. 2006;21(2):333-52. doi: https:/doi.org/10.1037/0882-7974.21.2.333
42. Holzinger A, Searle G, Wernbacher M. The effect of previous exposure to technology on acceptance and its importance in usability and accessibility engineering. Universal Access in the Information Society. 2011;10(3):245-60. doi: https:/doi.org/10.1007/s10209-010-0212-x
43. Frey CB, Osborne MA. The future of employment: how susceptible are jobs to computerisation? Technological Forecasting and Social Change. 2013;114:254-80. doi: https:/doi.org/10.1016/j.techfore.2016.08.019
44. Vogels EA, Rainie L, Anderson J. Experts predict more digital innovation by 2030 aimed at enhancing democracy. Pew Research Center. 2020. Report No:ED609129:133
45. Holden H, Roy R. Understanding the influence of perceived usability and technology self-efficacy on teachers' technology acceptance. Journal of Research on Technology in Education. 2011;43(4):343–67. doi: https:/doi.org/10.1080/15391523.2011.10782576
46. Laher AE, Van Aardt BJ, Craythorne AD, Van Welie M, Malinga DM, Madi S. 'Getting out of the dark': implications of load shedding on healthcare in South Africa and strategies to enhance preparedness. South African Medical Journal. 2019;109(12):899-901. doi: https:/doi.org/10.7196/samj.2019.v109i12.14322

RESEARCH ARTICLE

Occupational therapy services for children with Autism Spectrum Disorder on the primary healthcare platform

AUTHORS
Rikki Greenberg[a]
https://orcid.org/0000-0003-0648-5523
Patricia de Witt[a]
https://orcid.org/0000-0003-3612-0920
Marica Botha[a]
https://orcid.org/0000-0002-6607-186X

AFFILIATION
[a]Department of Occupational Therapy, School of Therapeutic Sciences, Faculty of Health Sciences, University of the Witwatersrand

CORRESPONDING AUTHOR
Patricia de Witt
patricia.dewitt@wits.ac.za

KEYWORDS
early identification of Autism Spectrum Disorder, early career occupational therapists, community context, clinical competencies, community based occupational therapy, critical knowledge

HOW TO CITE THIS ARTICLE
Greenberg R, de Witt, PA, Botha, M. Occupational therapy services for children with Autism Spectrum Disorder on the primary healthcare platform. South African Journal of Occupational Therapy. Vol 53 No 2. DOI: https://doi.org/10.17159/2310-3833/2023/vol53n2a3

ARTICLE HISTORY
Submitted: May 2022
Reviewed: January 2023
Revised: March 2023
Accepted: March 2023
Published: August 2023

EDITOR
Hester van Biljon
https://orcid.org/0000-0003-4433-6457

DATA AVAILABILITY
Rikki Greenberg Email: rixigreen@gmail.com

FUNDING
None to declare

On-line 2310-3833

ABSTRACT

Introduction: The diagnosis of Autism Spectrum Disorder (ASD) is complex. In a low middle income country, like South Africa, early recognition of ASD rarely occurs on the primary health care (PHC) platform. To mitigate late diagnosis of ASD, which has a poorer prognosis, the purpose of this study was to identify the knowledge and clinical competencies required by inexperienced occupational therapists to improve early detection of and service delivery for children with ASD at the PHC level.

Methods: A descriptive qualitative design explored the perceptions of occupational therapy experts as to the required knowledge and clinical competencies necessary for inexperienced occupational therapists to deliver services to children with ASD on the PHC platform. Thematic inductive analysis was used to analyse the data.

Findings: Two themes emerged: Theme one: the perceived critical knowledge for early identification, assessment and treatment of children with ASD. Theme two: the clinical competencies required for assessment and effective treatment of children with ASD on the PHC level.

Conclusion: This study identified the perceived knowledge and clinical competencies needed to improve early identification and service community-based delivery for children with ASD on the PHC platform by early career occupational therapists.

IMPLICATIONS FOR PRACTICE

- This study provides critical knowledge and clinical competencies to occupational therapists to facilitate effective therapeutic services to children with ASD on the PHC platform.
- The study identified appropriate screening, assessment and intervention that could assist occupational therapy service planners to reduce the gap of service delivery for children with ASD within the concept of UHC provision on a community-based level in SA.
- Faculty at tertiary educational institutions may utilise the findings in order to adapt curriculums to better prepare inexperienced occupational therapists with working with children with ASD on the community-based level.

INTRODUCTION

Healthcare in South Africa is provided by two inequitable health care delivery systems, namely an under-resourced public healthcare system which provides for 73% of the population, and a well-resourced private sector which provides for the other 27%[1]. In November 2020, the government announced a 10-year timetable for the phased introduction of universal health coverage (UHC), funded by a National Health Insurance (NHI). These health care reforms aim to unify these two disparate health sectors following the principles as set out in the National Health Act [61 of 2003] Guide 3rd Edition[2]. The intention is to address the inequitable distribution of finances, large caseloads, poor infrastructure, and limited resources which have impacted on the public healthcare services' capacity to deal with amongst others, non-communicable diseases, including Autism Spectrum Disorder (ASD).

Autism Spectrum Disorder, considered the second most prevalent developmental disability in the world, has had a 30% increase since 2008[3,4]. Although ASD is a complex condition, individuals seldom require hospitalisation and in South Africa it is only when children fail to thrive, and/or their behaviour becomes increasingly problematic that they are referred to paediatric or psychiatric tertiary healthcare services for management. Even when they are referred within the public health sector (PHS) which approximately 73% of children utilise[1], there are long waiting periods for specialist services and some children cannot access these centralised facilities due to high transport costs[2]. These factors contribute to an estimated 30% of South African children with ASD not being able to benefit from appropriate health care required to address the wide range of difficulties influencing their development, health and wellbeing[5,6].

Early identification and treatment of children with ASD[5] is recognised as critical in improving and managing this condition[7,8,9]. Therefore, due to the chronic nature of ASD, children should be managed on the PHC platform. Early identification requires effective early screening to identify at-risk individuals at a PHC level, and once the diagnosis of ASD and medical management has been confirmed, treatment can be offered near the children's homes within the community setting[7]. In preparation for the introduction of UHC (funded by the NHI), opportunities now exist that such services for children diagnosed with ASD with the provision of rehabilitative services such as occupational therapy can be offered at the PHC level. However, health care workers, working on the PHC platform in South Africa are currently reported to feel ill-equipped in early treatment and identification of children with ASD[7,8].

All children with ASD would benefit from occupational therapy to enable successful and age-appropriate performance in their daily occupations as well as positive engagement with their environment and society[3,10,11]. Such services at a PHC level in South Africa are likely to be delivered by inexperienced occupational therapists completing their community service year[12] (a year completed immediately after qualification as a requirement to obtain licensure as an independent practitioner[12]). There is a lack of research on occupational therapy service delivery for children with ASD, especially in PHC-based facilities in low to middle-income countries (LMIC)[13]. This has resulted in a limited understanding of the skills occupational therapists need to be able to identify children at risk of ASD and to provide early intervention once diagnosed[13].

Therefore, this study aimed to explore the perceptions of expert occupational therapists, based on their experiences with children with ASD in clinical practice, as to the knowledge and clinical competencies inexperienced occupational therapists require to deliver essential services to children with ASD between ages of 2-6 years on the public PHC platform.

Literature Review

The 2021 Global Prevalence of Autism study indicated that, worldwide, approximately 52 million people have ASD[14,15]. The average global prevalence is just under 1%, affecting 1 out of 132 children aged 3-10 years[15] with 90% of people with ASD reported to reside in LMIC[14,16,17]. South Africa has a reported higher than global prevalence with 1 in every 110 children (0-18 years) affected[18] thus placing a greater need on the healthcare system to provide relevant and appropriate services to individuals diagnosed with ASD[18,19].

The symptoms of ASD are typically noted at 18 months of age and in well-resourced countries children are generally diagnosed between the ages of 3 and 5 years old[4,11]. It has however, been suggested that many children in South Africa remain undiagnosed and untreated due to a lack of understanding of this complex disorder and a lack of intervention opportunities provided on the PHC platform by a multidisciplinary team (MDT)[6,9]. A scoping review by De Vries[17] found that in South Africa, children screened as having ASD typically waited approximately 18 months to obtain an appointment with a specialist in the PHC sector for diagnostic purposes. This is consistent with the conference report by Ruparelia *et al.*[6], which indicated that in African countries late diagnosis of ASD was common and the condition is not easily identified until the symptoms negatively influence typical development and the child's quality of life.

Recommended treatment for ASD involves a MDT approach on an out-patient basis[20]. Multidisciplinary intervention, including occupational therapy, has over time been found to assist these children in engaging with their environment and in performing their daily activities as they develop[21]. Although occupational therapy is reported to be an essential service for children with ASD, limited research has been reported regarding the best practice in ASD diagnostic assessment[22], although Rutherford *et al.*[22] highlighted the importance of each MDT member completing a comprehensive assessment of a child with ASD using evidence-based clinical guidelines. These guidelines for ASD (developed in Scotland) recommend that the three following components be included: clinical history, clinical observation and a contextual assessment - either through observation or the administration of appropriate questionnaire/standardised assessment tools. While certain assessments have been regarded as valid and reliable globally, based on research; they have high cost implications, require training and are time consuming to administer which limits their feasibility as ASD specific tools on the PHC platform in South Africa[17,23–25].

Kadar, Mcdonald and Lentin[25] reported that as a result non-specific diagnostic standardised assessments and informal observations are commonly used to provide insight into the occupational profile and behaviour of children with ASD, particularly in occupational therapy[22]. Typically a detailed clinical history is completed first by interviewing caregivers or family members, in order to provide a holistic view of the child[22]. Due to time constraints within the PHC sector and lack of early diagnosis; many therapists utilise a diagnostic treatment approach[6,26–28] defined as concurrently providing therapeutic intervention while observing symptoms and signs and observational skills during the commencement of therapeutic interventions to facilitate identification of at risk ASD symptoms[22].

The best evidence for effective intervention for young

children with ASD recommend the use of behavioural and developmental approaches[11,29,30], while Vinen[31] indicated that the two most frequently described interventions in occupational therapy are sensory-based and play-based approaches. According to Moosa[21], South African occupational therapists working in the private sector, most frequently use sensory based and motor relearning approaches. These include Ayres Sensory Integration® (ASI®) and Neurodevelopmental Therapy (NDT). Therapists in this study also reported sometimes using occupation based, developmental and behavioural frameworks.

In South Africa, family-centred and parent-based interventions are usually considered when providing therapeutic intervention for children with ASD due to the insufficient number of health professionals to meet care demands[17,32]. This is consistent with the international trend where parent-mediated intervention has become popular due to a lack of healthcare professionals, high costs and poor medical coverage; resulting in children being less likely to obtain the necessary therapist-mediated therapy. Thus, parent-mediated therapy, thought to be more cost-effective, focused on coaching parents is used[33].

There is little agreement as to the most effective intervention for children with ASD; and most of these therapeutic interventions require post basic qualification. Some authors emphasise that confidence, knowledge and skill regarding dealing with a child with ASD comes from clinical experience and practice[34]. The majority of the therapists working on the PHC platform, particularly in South Africa, are inexperienced and often in the early stages of professional development[12,20]. Thus, their knowledge of the ASD as a condition and their ability to provide effective therapy is based on their undergraduate learning, and supervised clinical experience, with input from work supervisors and colleagues[35,36]. Many therapists also report challenges in extending their basic knowledge and clinical competences[20,25,34,35] in relation to dealing with a child with ASD and an urgency to determine the gaps in knowledge and clinical competencies that need to be filled has been identified.

METHODS

Research design

This study used a qualitative, cross-sectional, descriptive design, where the data were collected from key informant interviews. This design was appropriate as the data provided a contextual experience for the perceptions and experiences of expert occupational therapists who have worked with children with ASD in South Africa to provide a deep and thick description of perceived the knowledge and skills set required to assist inexperienced occupational therapists to deliver services to children with ASD within a community setting.

Sampling

Purposive and snowball sampling was used to recruit occupational therapy experts who met the inclusion criteria of at least 10 years' experience in delivering services to children with ASD in a variety of service delivery settings - including non-PHC platforms. Consenting participants were chosen based on the assumption they would have acquired the knowledge and clinical reasoning as well as have mastered the clinical skills for delivering services to this population. Consistent with qualitative research sample size[37] a small sample of 12 individuals were interviewed.

Research procedure

All the key informant interviews were conducted virtually by the first author through: Skype, Zoom or WhatsApp video platform as the data collection process occurred during the National Alert Level 4 and 5 lockdown period of the COVID-19 National Disaster Regulations[38]. Passwords and meeting links were provided to the participants individually and confidentiality was ensured by both the researcher and participant being in a private, undisturbed rooms. Participants were given the option to keep their cameras on or off, allowing for interviews to either be audio recorded and or video recorded. Semi-structured interviews which included open-ended questions with several probes to facilitate in-depth discussions, were used to collect the data[39]. Ethical clearance for the study was obtained from the Human Research Ethics Committee (HREC) (M190917), University of Witwatersrand. Twenty-five potential participants across South Africa were contacted telephonically, but only 18 met the inclusion criteria. Of these individuals 12 indicated their willingness to participate in the study and gave written consent to participate and for the interview (1 hour – 1 hour 30 minute) to be audio-taped.

Prior to the interview consenting participants completed a short online demographic questionnaire about personal characteristics, professional education, clinical experience and continued professional development pertinent to ASD.

Data saturation was achieved at the sixth interview as new information from interview seven onwards contributed less than 5% to the codes that had already been identified in the data analysis using the data saturation index[40]. An audit trail recorded all the steps and decisions that were made during the research process. The trustworthiness of the research was assured by applying the principles of credibility (peer debriefing, triangulation and member checking), transferability (thick description and purposeful sampling by using expert participants in different provinces and service delivery contexts to provide diversity), dependability and confirmability (code-recode strategy used as well as peer examination through audit trails and bracketing)[41].

Data Analysis

Data from both the demographic questionnaire (Table I, page 21) and the interview (Tables II and III pages 22 and 23) were analysed descriptively. Thematic descriptive content analysis occurred once the verbatim transcriptions of the interviews were checked for accuracy against the audio recordings. Coding was used to develop and modify the themes using the following steps: familiarisation with the data by reading and re-reading the transcripts; colour coding categories through direct content analysis; generating initial codes and themes; development of a matrix to place the themes, categories, and codes; themes reviewed by the supervisors and revised. The transcriptions were also

Table I: Demographics and experience of participants

Participant	Age range (years)	Pro-vince	Work place	Years in field OT	Years treating ASD	Postgraduate education	Continuous Professional Development
P1	55+	WC	PP PrS	25+	15-20	MSc OT (WITS)	DIR®-FCD; DIR®/FloortimeTM; Certified in ASI® (SAISI); NDT; Talks and workshops in ASD
P2	36-45	G	PP	10-15	10-15	MSc Child Health and Development Fine Arts Hons	ASI® (SAISI) level 1,2,3; 2.; Autism Centred Education tutor; Makaton (course and tutor); TEACCH; ACE; Lecturer for the MSc in Child Health and Neurodevelopment; some years working at school for Autism
P3	36-45	G	PP PuS	15-20	15-20	MSc OT (WITS)	DIR®/FloortimeTM
P4	26-35	FS	PP	10-15	10-15	M OT (UFS)	Introductory module DIR®/ FloortimeTM, Talks and workshops in ASD; (Completing ESD certification); Certified in ASI® (SAISI)
P5	36-45	G	PP	10-15	10-15	MSc OT (WITS)	Talks and workshops in ASD; Makaton; SI training; Therapeutic listening; Hands-on autism course
P6	36-45	L	PP	15-20	15-20	Masters in Early Childhood Intervention (UP)	SNAP training workshop; DIR®/ FloortimeTM level; Certified in ASI® (SAISI); NDT
P7	26-35	WC	PP	10-15	10-15	Masters in Early Childhood intervention (UP)	Talks and workshops in ASD; DIR®/ FloortimeTM; Certified in ASI® (SAISI)
P8	46-55	EC	PP	25+	15-20	None	DIR® approach; ABA approach; Certified in ASI® (SAISI)
P9	36-45	G	PP	10-15	10-15	M OT (UP)	SI (SAISI); Makaton
P10	36-45	G	PP	10-15	10-15	None	Talks and workshops in ASD; SI training
P11	46-55	KZN	PP	25+	10-15	None	School autism unit for some years; DIR®/FloortimeTM (ICDL - Expert level)
P12	55+	WC	PP SA	25+	> 25	M OT (US)	Certified in ASI® (SAISI); DIR®/ FloortimeTM (level4); Interactive Metronome; Tomatis Consultant (level 3); Therapeutic Listening Musgatova MNRI; PTSD reflexes; PECS

Key: OT = occupational therapy; WC = Western Cape; G = Gauteng; FS = Free State; L = Limpopo; EC = Eastern Cape; KZN = KwaZulu-Natal; PP = private practice, PrS = private schools, PuS = Public schools,
SA = School for Apraxia

provided to a co-coder, who was also performing her research in ASD, to eliminate bias. The credibility of inductive codes was determined by repetition across transcripts, strong emphasis, topic changes or specific phrases.

FINDINGS

Demographics

All twelve participants were female, and 50% were aged between 36-45 years of age. Participants from six of the nine provinces in South Africa were represented, although the most were from Gauteng (n=5). (See Table I, above). Seven participants had 10-15 years of working experience and clinical experience with children with ASD, in a range of 10 to 25 years.

Participants' post-graduate training occurred at five different universities (see Table I, above). All participants had completed additional training by attending CPD courses on children with ASD. These included Ayres Sensory Integration (ASI®)[42], Neurodevelopmental therapy (NDT), Makaton signing[43], Picture Exchange Communication system (PECS)[44], DIR®/Floortime™[45] and Therapeutic Listening[46]. The most frequently attended were ASI®[42] (9=97.5%), followed by DIR®/ Floortime™[45] (n=8; 66.7%).

Two themes emerged from the collective data from the 12 interviews, pertaining to how to assess and treat children with ASD: The first theme described the perceived knowledge required, while the second theme described the clinical competencies necessary to treat children with ASD on the PHC.

Theme 1: Critical knowledge required for assessment and treatment of children with ASD on the PHC platform

Theme 1 described the participants' perceptions of the Critical Knowledge for assessment and treatment of children with ASD on the PHC platform (Table II, page 22). The essential features of this theme described the perceived critical knowledge inexperienced therapists needed to understand ASD by referring to diagnostic criteria and presenting symptoms as well as 'red flags' and

Table II: Theme 1: Critical knowledge required for assessment and treatment of children with ASD on the PHC platform

Theme I	Categories	Subcategories	Codes
Critical knowledge for assessment and intervention of children with ASD on the PHC platform	Understanding ASD	Diagnostic criteria	DSM-V: Diagnostic criteria and symptoms
			Struggles with social connectedness and living own world
			Communication, behavioural and sensory processing difficulties
		'Red Flags'	Physical flags: motor control and praxis difficulties, lack body awareness, hyper-mobility joints.
			Psychosocial flags: communication skills, sensory processing, struggles to relate and engage.
			Challenging behavioural flags: restricted, routinised and repetitive behaviours; meltdowns; inappropriate behaviours.
			Occupational dysfunction flags-: play difficulties; ADL difficulties; social participation difficulties.
	Understanding intervention factors for ASD	Treatment considerations for the primary platform	Referral pathways
			MDT involvement
			Parent-child relationship
			Cultural influence and impact on the intervention; stigmatisation and assumptions; accept and respect beliefs

understanding intervention factors to be considered on the primary platform.

Critical knowledge for assessment of children with ASD on the PHC platform

All participants (N=12) emphasised the importance of understanding the diagnostic criteria for ASD in terms of clinical and behavioural presentation. This would allow for early recognition of ASD, and ultimately timely intervention and effective communication about the diagnosis with other healthcare practitioners and caregivers.

> "...first of all the signs and symptoms, so they need to understand what is Autistic Spectrum Disorder ..." **[P1]**

> "DSM V and actually go through the criteria with them ... because that is clinically what we should use when we deciding whether a child is on the spectrum or not" **[P5]**.

> "...I think a vital competency is to be able to screen and identify very early in childhood what would be presenting signs or characteristics that they need to look out for [in children with ASD] ..." **[P4]**

The majority of the participants utilised their understanding of the diagnostic criteria to form individualised definitions of what the inexperienced therapists should consider:

> "[ASD] Is a child whose communication interaction is ... affected in such a way, also that they struggle to engage with their environment ...; engage with people around them, engage with activities and yes; with sometimes some behaviour that is out of sync. That is not normal typical behaviour for children ..." **[P8]**

> "ASD is a neuro-biological challenge, a child has a really tough time organising or processing their world ... "**[P1]** "So, they really struggle with that social connectedness with other people. They are often in their own little world ...letting people into their world or them joining your world is very difficult." **[P3]**

Participants viewed some 'foundational' knowledge as 'red flags' to guide inexperienced occupational therapists in screening (physical, psychosocial, challenging behaviours and occupational dysfunction) through understanding the 'critical signs and symptoms' with which children with ASD may present. Most participants highlighted the observation of physical features and identified motor control and praxis difficulties as critical. They stressed children with ASD have difficulty with their body awareness as well as their difficulty with proprioception, visual-spatial challenges and tip-toe walking:

> "...ASD there is very often motor control issues as well. We know from our occupational therapy perspective that many of these children have praxis difficulties, dyspraxia ..." **[P10]**

> "...they are awkward, we know they are very clumsy, we know that their core control is extremely, extremely bad ..." **[P7]**

All participants believed the psychosocial symptoms to be the earliest identifying sign in young children for ASD, particularly communication skills. This includes non-verbal and verbal communication such as pre-linguistic and linguistic skills, specifically limited eye contact, joint attention and relating and engaging with others in their environment.

> "...social interaction; not communicating; not giving eye contact, not being able to communicate appropriately, for that child's age, with a person." **[P9]**

Sensory processing difficulties were highlighted although this is not included as a DSM-V3 criterion. All participants indicated that in their experience, children with ASD have sensory processing difficulties, particularly with their sensory modulation and therefore this should be considered an identifying feature:

Table III: Theme 2: Clinical competencies required for the assessment and treatment of children with ASD on the PHC platform

Themes	Categories	Subcategories	Codes
Clinical competencies for assessment and treatment of children with ASD on the PHC platform	Layered Assessment process	Tools to screen	Red flag identification
			ASD specific screening tools
		Non-Standardised assessment	Informal observation of milestones and occupational performance
			Informal observation sensory modulation and behaviours
			Parent interaction
		Assessments	Non-ASD specific assessment
	Families as partners	Parents and caregivers used in therapeutic process	Educate and empower parents/caregivers and ensure a support system
			Collaborate with parents/caregivers
			Coach parents/caregivers
	Child-centred practice therapeutic intervention	Goals/outcomes	Functional and occupation-based: simple, realistic and adaptable
		Types of intervention	Sensory-based, Developmental, Behavioural
			Other interventions
		Therapeutic use of self	Building trust, wait, watch and wonder
			Be aware of body positioning, appearance and movement
			Limit communication and utilise your voice and facial features
		Occupational therapy principles	Follow child's lead -join child in their world
			Regulate and modulate child; skill development in sensory appropriate environment; Uncluttered, small, structured
			Start on child's developmental level - expand play in their interest
			Intentional and constructive communication and social participation
			Use behaviour
			Provide therapy techniques appropriate culture and health literacy

> "...[a child with] ASD has a lot of sensory issues. Whether it's stronger towards the modulation side or stronger towards the praxis side ..." **[P10]**

The third red flag to emerge was the challenging behaviours that often occur with children with ASD. Inappropriate or atypical behaviours were viewed by participants as behaviours that were not age-appropriate to the child:

> "It is about looking at the signs, what you are seeing in terms of relating; communicating, repetitive behaviours and restrictive interests ..." **[P1]**

> ""...when you see the poor language skills in combination with the lack of joint attention behaviours that becomes a huge red flag. So that is one for me and then restricted and repetitive behaviours ..." **[P4]**

Participants identified 'meltdowns' that occur as a result of sensory processing difficulties, which are a defining feature of ASD:

> "So that if they were screaming, head banging, poor sleep, biting, yes there are processing problems which might be meltdowns if they cannot react very well to their environment." **[P8]**

The final red flag to emerge in identifying children with ASD was occupational dysfunction

> "ASD is a syndrome that impacts a child's ability to act appropriately according to their age, in their play, in their social interaction, in their activities of daily living and in their scholastic environment ..." **[P9]**

Critical knowledge for the treatment of children with ASD on the PHC platform

Knowledge critical to understanding the provision of occupational therapy services for treatment for children with ASD on the primary platform is awareness of referral pathways. This indicated the need for the role of occupational therapists to be aware of the public health system specialist and other multidisciplinary services which can be accessed for diagnosis and other supportive needs:

> "I always feel very strongly that as OTs, you know, we very often refer a child with any deficits to a specific specialist or a doctor for a diagnosis, and you know that makes a big difference in terms of school placement or in terms of medication ...**[P10]**

The knowledge of MDT involvement emerged as critical due to the complex nature of the condition, which results in understanding MDT interventions for relationships to be built with other healthcare professionals such as speech therapists and NDT physiotherapists to ensure improved service delivery for children with ASD:

> "...so, I work very closely with our speech therapist. So, building those multidisciplinary relationships is very important." **[P3]**

The parent-child relationship is important to understand in ASD, especially when providing early intervention and therapeutic services [on the PHC platform]:

> "...establishing your relationship with parents and child, and that will be the starting point of your assessment.... .use your clinical reasoning there and see what the parents are doing and how they're handling the situation ..." **[P9]**

Finally, knowledge about the cultural influences on ASD and the impact they may have on intervention was perceived as important by the participants. Knowing, accepting and respecting beliefs was seen as essential to service provision for children with ASD. One also needs to understand the stigmatisation of the child and the family around the disorder, along with the assumptions that people in the community may have regarding the diagnosis:

> "...I thought it was culturally appropriate for this child to eat with his hands... but for the family, they actually wanted to have him to sit with them and eat with a knife and fork." **[P6]**

Theme 2: Clinical competencies required for the assessment and treatment of children with ASD on the PHC platform

Theme 2 described the participants' perceptions of the Clinical Competencies required for the assessment and treatment of children with ASD on the PHC platform (Table III p23). Participants highlighted the skills required for a layered assessment process and the importance of parent-mediated therapy and involvement of family members. Child-centred practice with emphasis on treatment goals, interventions and principles was emphasised.

Clinical Competencies for assessment of children with ASD on the PHC

Participants explained what they perceived to be the layered process involved in the assessment of these children which needs to be followed by inexperienced occupational therapists for both higher functioning and lower functioning children.

The participants discussed the importance of tools to screen children with ASD particularly 'red flag' identification. Others suggested screening tools that identify psychosocial and behavioural difficulties including information obtained from the parents:

> "I think early intervention screening would already help a lot because you can already start engaging at least [with the] behaviour because [that is] the biggest issue that the parents come and see us, is the behaviour." **[P8]**

> "... just include whatever background information I can get from the parents or the caregivers. In my practice I would do a sensory profile, the toddler questionnaire or the normal sensory profile ..., gross developmental milestones ..."**[P10]**

> "...[initial interaction with parents] during intake [session] you're asking questions and when some of those red flags come up: the language and they're difficult to be around, those kind of things ...." **[P11]**

Few participants suggested using ASD specific tools designed to screen children with ASD, and some suggested using a 'checklist' such as the Modified Checklist for Autism in Toddlers, Revised (M-CHAT-R)[47]: as well as

> "The Childhood Autism Rating Scale(CARS-2)[48] is also a really nice little tool that we can use ..."**[P5]**

Many participants reported using non standardised assessment over two or three sessions would be more beneficial than a specific assessment performed on a child who has been diagnosed with ASD:

> "Our Autistic kids do not assess well at all and in general in our practice when we seeing a child under the age of three... where we assess them over two or three sessions ..." **[P5]**

Participants, who were experienced in children ASD, perceived that experiential learning is required but suggest these non-standardised assessments allow identification of the child's weaknesses and strengths and should include informal observation of the children's milestones and occupational performance, sensory modulation and behaviours in familiar contexts. Observation of the parent-child interaction in the assessment of a child should always be used to collaborate with their assessment findings:

> "...So yes, I think informal occupation-based assessments generally work better with ASD kids because they don't follow verbal instructions. They don't sit down and do formal standardised tests. So, play-based and informal type of assessments definitely work better ..." **[P4]**

> "...informal you know just observations... To see if they cope with movement input, see if they cope with tactile input, see how they react to various levels of maybe auditory stimulation, visual stimulation ..." **[P10]**

> "I'll do observations in the classroom, observations on the playground around their social skills, around their postural control, around their fine motor skills, their ability to eat, to brush their teeth ..." **[P3]**

Participants reported assessment with non-ASD specific tools were also used to help assess the child depending on their age and level of functioning. These refer to either visual perceptual assessments, sensory profile or developmental assessments.

> "I'd rather use something like a BEERY or a DTVP 2 or 3, because it's a lot shorter, and you can break it up into smaller bits if you needed to ..." **[P3]**

Clinical Competencies for the treatment of children with ASD on the PHC platform

Participants viewed family partnership as important in the context of PHC with limited occupational therapy

services, by including the including parents and caregivers in the therapeutic process so they are part of the journey. Continuation of therapy at home due to limited time (session duration and sessions in a month) is essential. Parental support needs to be contextually and culturally appropriate:

> "..I think it's really important to put them in touch with support groups and Autism South Africa's got lots of opportunities for that ..." **[P5]**

Educating and empowering the parents and caregivers by imparting knowledge about the treatment with children with ASD and attending to the support system for and needs of the parents, and caregivers' is important for the continuation of the therapeutic process at home:

> "...I feel that, that is definitely where OTs can support the parents. They need to be empowered with information because if they understand why their child is doing something ..." **[P2]**

> "...if parents understand what you're doing, they buy into it. Then you see better progress with the kids, for sure." **[P7]**

Occupational therapists need to collaborate with the parents and caregivers to ensure that the skills worked on in a therapy session with the child are based on a mutually decided goal and not just the outcome sought by the therapist. A proposed role of occupational therapists within the PHC is as a coach to the caregiver:

> "...So, I ask them, what would make life just a little bit easier for you? And then from that I get things like, if he would stop pulling the dog's tail or if he would stop taking his clothes off... I see how I can get [to] that first goal for the parents while working on the developmental norms ..." **[P6]**

> "...with therapy with autistic kids it's not about you being the great therapist, it's actually about you being the coach and helping parents ... **[P11]**

The importance of all treatment being child-centred was stressed since each child with ASD is unique and one treatment method cannot be applied to all children. Treatment should be planned and executed considering the uniqueness of the child and their needs:

> "...So, I need to make a choice when I work with kids, what is the most relevant frame of reference or model to use with them [considering all the facts] ..." **[P4]**

Participants gave their views on the various approaches that inexperienced therapists should consider when engaging in therapeutic intervention. From their 'personal experience' and 'insight', four subcategories were identified:

- goals for occupational therapy to be congruent with the parents and child. All participants believed that the goal/outcome should be occupation-based so that the focus of the child's function and not limitations could be identified. Goals should be simple, realistic and adaptable. Many participants reported that challenging behaviours occur when you expect the child to perform tasks that are too complex since they become overstimulated or overwhelmed.

> " ... taking that step back and asking them 'what are your goals, what are your ideals?" **[P5]**

> "Of goals; I think it is to keep it at least functional. Yes, all our goals must be functional anyway maybe simple..... what I do in therapy is that it should carry over at home." **[P8]**

> "So, my goals change depending on the child on that day and what they need on that day....It's much smaller steps... much, yes....so very, very smaller goals because otherwise they get very discouraged" **[P6]**

Most participants highlighted that to ensure that 'buy in' and 'carry over' occur within the PHC platform approach, the goal must be not only beneficial for the child but for the family as well.

> "...goals that are important to the family and to the child ..." **[P5]**

- types of intervention that could be provided and the foundational principles these experts use to treat children with ASD. The main intervention types used to treat children with ASD were sensory-based and developmental frames of reference:

> " I think first and utmost for me myself in the practice, I think I wouldn't be able, and I don't think I will be willing to – treat any ASD children if I didn't have my SI background ..." **[P10]**

> '"The main tools, I suppose I would use with DIR is getting to their level ..." **[P9]**

Some participants reported the 'behavioural' interventions as being useful, especially Applied Behavioural Analysis (ABA) intervention, while others disagreed with utilising behavioural interventions within their practice:

> "I think it's got a place for children but generally I don't like ABA for very young kiddies, I like it for my kids that are plateauing in OT ..." **[P5]**

- Other interventions used with children with ASD included communication interventions such as AAC and PECS. Feeding and brain balance programmes were also highlighted as interventions used with certain children with ASD but these interventions are not effective with all types of children with ASD. This was dependent on their needs and their therapeutic goals:

> "...And then obviously things to get some sort of

communication so... or using the Pecs." [P7]

"....[if there is a] feeding difficulty specifically with all the age groups then I'll do the SOS feeding approach ..." [P5]

- Participants described specific principles for enhancing therapeutic use of self to engage a child effectively in sessions. These included:

Building trust was seen as an important factor in therapy sessions as many participants perceived that, children with ASD struggle to engage without trust due to their circumstances and experiences of the outside world:

"Yeah. I think I've learnt to use myself in a more therapeutic manner...So being able to modulate my response to a child's actions ..." [P3]

"...and I'd really wanna try and build trust because especially our kids in [the] community, they've been exposed to adults in their lives that are probably smacking, hitting, grabbing, pulling, shoving [to try to manage their atypical behaviour], ..." [P5]

Being aware of the child's body positioning, appearance and movement was an important element of the therapeutic use of self when approaching a child with ASD:

"It's using your body in a way that's going to encourage a child to engage with you or to do an activity...And allowing them into your space, or allowing yourself not to go into their space. So, reading the child appropriately, and using your body as; and all your actions that you do ..." [P3]

"Also, not wearing bright scrubs, kids respond to the colours that you are wearing, nail varnish, rings, long earrings, bangles that click." [P2]

Also, the effect that one's voice and communication can either limit or facilitate a child with ASD's engagement, with particular focus on tone of voice and facial expressions:

'It's using your voice in a way that's going to engage them again and again. Like I said, not too loud, not too soft, not too squeaky, not too deep, depending on what the child is needing ..." [P3]

"...at the beginning, just use the sounds and then later it would be "throw, throw" and then it would start being like the action word that you would use." [P7]

Participants also highlighted providing enough time to respond to an action, gesture or verbalisation. Be patient with children with ASD so they do not become overwhelmed.

"...the whole wait, watch and wonder thing is something that sits well with our core ethos ..." [P4]

- Participants reported using occupational therapy principles or specific guidelines for therapy sessions that related to appropriate activity requirements, very specific presentation and handling principles, as well as considerations of the treatment context, including environment.In facilitating engagement and participation in the therapeutic activity, as participants considered these children generally live in their own world or space which provides them with comfort and follow their lead:

'follow the child's lead by joining them in their world': "... entering into [their space with] what they are interested in, helps them to regulate, stay calm and build-up a bit of trust ..." [P1]

Participants also believed that the child first need to be regulated and modulated using a sensory appropriate environment through sensory modulation techniques or a sensory diet before attempting to perform any activity or task:

"...start sessions, in a cloud, in a hammock; ...and then I would try and use the vestibular and proprioception [sensory modulation techniques] to try and just regulate the system bit before we even start actually participating in a game." [P9]

"first, the child needs to be regulated, calm and share an interest." [P1]

All participants indicated the environment being structured - an uncluttered small room with only having toys that are necessary for the session to reduce distractions. The same room should be used to provide familiarity to allow the child to feel safe. Furthermore, limited visual distraction, smells and sounds within the therapy environment need attention to ensure that the child does not become preoccupied or get overstimulated by visual input, as visual input is generally a seeking sense for children with ASD:

"... I always bring them into this small room, this room is my like assessment room. I mean you can see it is quite uncluttered and we got neutral colours, all blues ..." [P1]

"...being aware of your own smells and the smells in the environment and how that can affect the child is important as well. And then any sounds in the environment, so white noise, may be distracting to the child, so fans going, if you've got a fridge or a computer in the room, that can have a low-frequency buzz that may affect certain children. Your lighting is important, ... normal fluorescent globes spin at a certain frequency that children on the spectrum, people on the spectrum or sensitive people can hear... So, it will certainly affect their life and their response in your session and everything ..." [P2]

Participants highlighted starting on the child's developmental level and expand on their play by building on their interest using intentional and constructive communication and social participation. Include

opportunities for pre-linguistic and linguistic skills, facilitate eye contact, joint attention and social engagement:

> "...is working along these developmental levels of relating and communicating..." **[P6]**

> "...it's almost like gentle playful obstruction that we do with these kids, so I think it's just changing the play with what they're doing and trying to get another level of play within that play. So just... yes, expanding it." **[P9]**

> "...can they have shared and joint attention and then can we start having circles of communication." **[P5]**

Using the child's repetitive behaviour and restricted interests to build the trust needed for interaction to occur and utilising their interest or seeking behaviour to facilitate their engagement: Atypical behaviours should only be treated if they are causing dysfunction and not interrupting the child's engagement or causing harm:

> "Now one could see, he was running and touching the poles, he was running back and forth, he was sliding up and down, he loves movement. So, I am going to use his preferred activities, his interests even if they are repetitive because they are my starting point ..." **[P1]**

Provide therapy techniques appropriate to culture and knowledge when dealing with PHC services in South Africa.

> "...But I can't see that the way that I treat will be changed by the family's cultural beliefs, and I think that's something that we are very lucky with in OT ..." **[P10]**

DISCUSSION

The study sample comprised 12 expert occupational therapists with 10 or more years of experience in dealing with children with ASD who were considered to be more than competent to provide the rich data for this study. Due to the limited number of occupational therapists with expertise in the specific context of this study namely the public sector, occupational therapists who worked in other sectors of practice with the same patient cohort were recruited to participate. Thus, the data included their perceptions of the importance of aspects from their own current practice in relation to knowledge and clinical competencies required for occupational therapy services on the PHC platform.

Critical knowledge required for assessment of children with ASD on the PHC platform

As suggested by Rosenbaum and Gabrielsen[49] during assessments occupational therapy experts agreed that the recognition of the diagnostic criteria stated in the DSM-V, which support the 'red flags identifiers', is of utmost importance in identifying and understanding ASD[49]. These include challenging behaviours (restricted, routinised and repetitive behaviours; meltdowns and inappropriate behaviours)[3,11]; psychosocial difficulties (non-verbal and verbal communication)[3,49] and physical components (poor motor control and praxis problems)[3,50] associated with ASD[3,11,49,50]. Although sensory processing/sensory modulation were viewed as at-risk symptoms for ASD, this 'red flag identifier' is not recognised within the DSM-V criteria[3] despite support in the literature indicating this as a prominent feature in children with ASD[25,35]. Most participants also proposed that occupational dysfunction (play, ADL and social participation) is a significant factor in identifying children with ASD[3], although this feature was not consistently recognised in this study. This is of concern, as occupational performance should be key component of occupational therapy practice for young children with ASD[51]

Critical knowledge when considering treatment of children with ASD in PHC, identified by expert occupational therapists concurs with the study by Atun-Einy & Ben-Sasson[20] indicating the benefits of MDT and caregiver involvement. The findings align with literature indicating that children with ASD are best treated within an MDT and family collaborative setting[20]. Therefore, understanding the referral pathways was identified as critical for inexperienced therapists to understand and provide effective services to children with ASD[9,20]. A limiting factor in this study is that the majority of the participants were not working in the PHC and were therefore unable to provide much insight on referral pathways in this sector[20].

Clinical competencies required for assessment of children with ASD on the PHC platform

For assessment of children with ASD in PHC, the participants recommended that inexperienced occupational therapists perform – at a minimum - a comprehensive parent interview along with an informal observation and, if at all possible, a non-ASD specific assessment to determine the child's strengths and weaknesses. This was considered a good guideline[22] and crucial for an assessment in ASD, as the best clinical practice assessments have not been identified for this population in South Africa[22]. Although some non-ASD specific assessments were identified as useful by the participants in this study, most participants disagreed with Baxter *et al*[15] and Kadar, Mcdonald and Lentin[25] on the usefulness of standardised assessments. Rather the expert occupational therapists indicated that due to limited time available informal observations and the use of checklist for identifying ASD symptoms[22] be considered. Formal screening assessments such as the MCHAT[47] CARS[48], or Autism Diagnostic Observation Schedule, Second Edition (ADOS-2)[52] are available with varying reports on their utility. Only the MCHAT, which is freely available and is in the process of being translated into some local South African languages[53], is likely to be used at a PHC level. The observations and screening should be triangulated with parent interviews would provide more of a holistic picture into children with ASD abilities than screening assessment scores on the PHC platform[6,17,27].

The findings of this study reiterated the findings of Naidoo, Van Wyk and Joubert[54], namely that the role of occupational therapists needs to be adjusted within the re-engineering of the PHC platform. Inexperienced therapists should align their services with the principles of PHC and UHC, to

improve services to and quality of life of children with ASD. Inexperienced occupational therapists should use more of a parent-mediated technique by coaching caregivers[2]. This view is consistent with other various literature[17,32] and agrees with the findings by Franz *et al.*[32], that providing parents with education and techniques to manage their child is of more beneficial than providing a once-off therapeutic session.

Expert occupational therapists recommended that the parent-child relationship was influential in the therapeutic process when providing services to children on the PHC platform. Inexperienced therapists need to be aware of this to provide families with appropriate techniques and skills that are suitable to the family, context and culture as supported in literature[33,55]. These views supported reports by Pang *et al.*[5] that treatments for ASD on the PHC platform need to accommodate the cultural practices within South Africa's context to be effective and culturally appropriate.

The participants indicated that occupational therapists need to set goals and treatment outcomes to ensure therapeutic benefits within sessions[33,55]. Both goal setting and parent involvement were perceived as essential for treatment outcomes. However, the participants did highlight some goals that inexperienced occupational therapists can achieve during sessions - these should be simple, functional, measurable and easy enough for both the inexperienced therapist and parents/caregivers to identify and achieve practically. Patriquin, MacKenzie and Versnel[56] concurred with this finding that goals regarding the managing of challenging behaviours, occupation and psychosocial areas of development were essential but did not provide any specific goals for children with ASD. Despite the literature reporting that goal-setting was occupation-based and functional, expert occupational therapists within this study reported intervention to be predominantly focused on the underlying deficits and very few focused on the occupational performance deficits which could relate to developmental stage of the child[11,21,34,49,55]. It appears however that for younger children a predominantly bottom-up (sensory-based, developmental, behavioural) rather than top-down (occupation-based) intervention approach is suggested. The use of occupational performance and participation issues were prioritised for older children[11,50].

Although the efficacy of intervention has been debated occupational experts proposed simple and foundational strategies that inexperienced occupational therapists are taught in undergraduate training[57] to utilise within treatment sessions. However, they agreed with Akhter, Mumtaz and Saqulain[58] that inexperienced therapists do not always have the underlying ability to integrate clinical competencies into practice on the PHC platform. This included the basic treatment principles, sensory stimulation (sensory-based), family-centred and developmental approaches, that can help therapists to facilitate play and caregiver engagement to promote child-lead engagement gradually and sequentially[29,30,32]. This concurs with Vinen[31] and Moosa's[21] intervention findings within South Africa context. While behavioural approaches were discussed, the expert occupational therapists did not use the behavioural interventions often, as some had concerns regarding this type of intervention. Therefore, the findings of this study aligned with those of Salomone *et al.*[55] but disagreed with evidence from other studies supporting behavioural intervention, which appears to be more widely used in developed rather than developing countries[11,29,30]. Other beneficial interventions found in the literature and mentioned by some participants in this study were communicative techniques and sound-based therapy[59]. These interventions typically require additional training and may not be plausible on the PHC platform nor are they recommended for inexperienced therapists[56]. Furthermore, the expert occupational therapists indicated that different interventions are more appropriate at different ages and phases of a child's development which is consistent with research[60].

Fundamental occupational therapy treatment principles that perceived clinical competencies were identified by the expert occupational therapists. These principles were commonly applied within their sessions and were considered contextually appropriate on the PHC platform[54]. Some of these principles identified by the participants are basic occupational therapy principles that are routinely taught in undergraduate programmes. Limited literature discussed principles within a therapeutic session without requiring additional training; due to the various types of intervention, the principles differ within these interventions. Of the principles identified by the expert occupational therapists, only one of the principles is reported to be identified and agreed upon within the literature, namely the structuring of the environment which consistently influences a child's engagement[11,29,30].

Expert occupational therapists highlighted the principle of therapeutic use of self as a clinical competency to use in establishing the therapeutic relationship with the child and caregivers. In addition, they recommended that factors such as being aware of one's own appearance and body position, the utilisation of their verbal and non-verbal communication, and providing time for a child with ASD to respond to the given task. No specific literature was found to collaborate or oppose these suggested therapeutic use of self-strategies; although general guidelines for all children were evident in the literature[61].

Other foundational principles identified were largely influenced by Sensory Integration (SI)[42] and DIR®/Floortime™[45] principles, including following the child's lead and joining the child in their world, starting on the child's developmental level and expanding on their play by building on their interest. The principle of regulating and modulating the child before skill development through a sensory-appropriate environment emanates from the SI and DIR® intervention types[42,45]. Although some principles are perceived to be plausible without additional training, particularly regarding body positioning and appearance, wait, watch and wonder and verbal and non-verbal strategies, it is important to acknowledge that some of these principles are rooted in DIR®/Floortime™[45]. The principle which was not specifically identified through other interventions within the literature was the use of behaviour to help facilitate engagement in the sessions. Many participants in the study highlighted the inclusion of repetitive behaviours and restricted interests at the beginning of therapy in order to obtain engagement and interaction from the child.

The last foundational principle to emerge was providing therapy techniques that are appropriate to culture and knowledge. Literature by Wetherby[26] and Pang *et al.*[5] has identified cultural influences extensively. While there is a cognitive awareness of how culture can impact therapeutic intervention, many experts reported that their use of techniques did not always focus specifically on cultural appropriateness. This largely highlights the adaption required for occupation-based service provision rather than just using approaches and techniques alone. This was supported by James, Pizur-Barnekow and Schefkind[36], who stressed the need for services and treatment for ASD to assist with cultural and linguistic diversity within South Africa.

It is suggested from this study that inexperienced occupational therapists required additional knowledge and education[6] to provide screening, assessment and intervention services to children with ASD on the PHC. Participants agreed with Juraszek *et al.*[61], that improvements in the information content of the occupational therapy undergraduate degrees are required to facilitate improved services to children with ASD. However, while there has been a call for revision of the undergraduate curriculum on ASD, a lack of teaching time was confirmed by Naidoo, Van Wyk and Joubert[54] Furthermore, minimum standards of training for occupational therapists by HPCSA does not prescribe the inclusion of any specific health conditions but requires students to integrate and apply knowledge skills and attitudes to people of different ages[61, 62].

Limitations

This study had several limitations which may influence the findings and thus these need to be considered with care. Although the findings from this research study agreed with the literature, occupational therapy principles for treating children with ASD, the therapeutic use of self and treatment considerations on the PHC from this study were not identified in the literature. This study also acknowledged the limitations regarding population sampling and the method of obtaining data.

CONCLUSION

Inexperienced occupational therapists are confronted with children with ASD on the PHC where they feel ill-equipped to provide therapeutic services to this population. To enhance inexperienced occupational therapists' ability to serve a population that will benefit from early detection, appropriate referrals and effective intervention; this study set out to explore the views and perceptions of expert occupational therapists working in private/public health or educational settings within South Africa, on the knowledge and clinical competencies required for inexperienced occupational therapists when working on the PHC platform to screen, identify, assess, and treat children aged 2-6 years with a diagnosis of ASD. The critical knowledge and clinical competencies which would enable services within the PHC platform was explored. Despite the scarcity of ASD-specific services on the PHC platform, possible assessment strategies that inexperienced therapists could utilise alongside screening tools, treatment strategies, intervention types and techniques; which could facilitate confidence with dealing with children on the PHC platform were described. This study identified occupational therapy treatment principles and techniques in addition to the therapeutic use of self as important for inexperienced therapists. The findings acknowledged that there is a possible gap in knowledge and clinical competencies in undergraduate training, which was not unexpected as the undergraduate courses aim to provide fundamental knowledge and skill and not cover all clinical eventualities.

Conflict of interests

No conflicts of interest declared by the authors.

Contribution of Authors

Rikki Greenberg – postgraduate student who conceptualised and completed the research and contributed to the article. Pat de Witt and Marica Botha- supervisors and conceptualisation of the research project and peer review of analysis with contribution to the article

REFERENCES

1. Department of Health. General Household Survey. 2020 https:/www.statssa.gov.za/publications/P0318/GHS 2020 Presentation 2-Dec-21.pdf
2. Department of Health. National Health Act Guide. 2019. https:/section27.org.za/wp-content/uploads/2019/07/Stevenson-National-Health-Act-Guide-2019-1.pdf
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5®). American Psychiatric Publications; 2013.
4. Newschaffer CJ, Croen LA, Daniels J, Giarelli E, Grether JK, Levy SE, Mandell DS, Miller LA, Pinto-Martin J, Reaven J, et al. The epidemiology of autism spectrum disorders. Annual Review of Public Health. 2007;28:235–258. doi: https:/doi.org/10.1146/annurev.publhealth.28.021406.144007
5. Pang YL, Lee CM, Wright M, Shen J, Shen B, Bo J. Challenges of case identification and diagnosis of Autism Spectrum Disorders in China: A critical review of procedures, assessment, and diagnostic criteria. Research in Autism Spectrum Disorders. 2018;53(May):53–66. doi:https:/doi.org/10.1016/j.rasd.2018.06.003
6. Ruparelia K, Abubakar A, Badoe E, Bakare M, Visser K, Chugani DC, Chugani HT, Donald KA, Wilmshurst JM, Shih A, et al. Autism Spectrum Disorders in Africa: Current Challenges in Identification, Assessment, and Treatment. Journal of Child Neurology. 2016;31(8):1018–1026. doi: https:/doi.org/10.1177/0883073816635748
7. National Department of Health. Framework and Strategy for Disability and Rehabilitation Services in South Africa 2015-2020. 2015:3–25. https:/www.google.com/search?client=firefox-b-d&q=ramework+and+Strategy+for+Disability+and+Rehabilitation+Services+in+South+Africa
8. Grinker RR, Chambers N, Njongwe N, Lagman AE, Guthrie W, Stronach S, Richard BO, Kauchali S, Killian B, Chhagan M, et al. "Communities" in Community Engagement: Lessons Learned From Autism Research in South Korea and South Africa. Autism Research. 2012;5(3):201–210. doi: https:/doi.org/10.1002/aur.1229

9. Chiri G, Warfield ME. Unmet need and problems accessing core health care services for children with autism spectrum disorder. Maternal and Child Health Journal. 2012;16(5):1081–1091. doi: https:/doi.org/10.1007/s10995-011-0833-6
10. DeLany J. Scope of Occupational Therapy Services for Individuals With Autism Spectrum Disorder Across the Life Course. The American Journal of Occupational Therapy. 2015;69(Supplement_3):6913410054p1-6913410054p12. doi: https:/doi.org/10.5014/ajot.2015.696s18
11. Mubashir S, Farrugia M, Coretti L, Pessia M, D'adamo MC. Autism spectrum disorder. Malta Medical Journal. 2020;32(3):56–66. doi: https:/doi.org/10.3329/jbcps.v28i3.6506
12. van Stormbroek K, Buchanan H. Community Service Occupational Therapists: thriving or just surviving? South African Journal of Occupational Therapy. 2016;46(3):63–72. doi: https:/doi.org/10.17159/23103833/2016/v46n3a11
13. Ametepee LK, Chitiyo M. What We Know about Autism in Africa: A Brief Research Synthesis. Journal of the International Association of Special Education. 2009;10(1):11–13. http:/search.proquest.com/docview/61867732?accountid=12347%5Cnhttp:/sfx.scholarsportal.info/mcmaster?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ:ericshell&atitle=What+We+Know+about+Autism+in+Africa:+A+Brief+
14. Zeidan J, Fombonne E, Scorah J, Ibrahim A, Durkin MS, Saxena S, Yusuf A, Shih A, Elsabbagh M. Global prevalence of autism: A systematic review update. Autism Research. 2022. doi: https:/doi.org/10.1002/aur.2696
15. Baxter AJ, Brugha TS, Erskine HE, Scheurer RW, Vos T, Scott JG. The epidemiology and global burden of autism spectrum disorders. Psychological Medicine. 2015;45(3):601–613. doi: https:/doi.org/10.1017/S003329171400172X
16. World Health Organization. World Report on Disability. Geneva: WHO Press; 2011. https:/www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/world-report-on-disability
17. De Vries PJ. Thinking globally to meet local needs: Autism spectrum disorders in Africa and other low-resource environments. Current Opinion in Neurology. 2016;29(2):130–136. doi: https:/doi.org/10.1097/WCO.0000000000000297
18. Autism South Africa. Autism South Africa. 2014. https:/aut2know.co.za/
19. World Health Organization. Autism. Sixty-Seventh World health Assembly. Agenda item 12.3. 2014. https:/apps.who.int/gb/ebwha/pdf_files/WHA67-REC1/A67_2014_REC1-en.pdf
20. Atun-Einy O, Ben-Sasson A. Pediatric allied healthcare professionals' knowledge and self-efficacy regarding ASD. Research in Autism Spectrum Disorders. 2018;47(June 2017):1–13. doi: https:/doi.org/10.1016/j.rasd.2017.12.001
21. Moosa AI. Exploring Occupational Therapy Intervention for Young Children with Autism Spectrum Disorder in South Africa. 2013. https:/researchspace.ukzn.ac.za/handle/10413/12080
22. Rutherford M, McKenzie K, McClure I, Forsyth K, O'Hare A, McCartney D, Finlayson I. A national study to investigate the clinical use of standardised instruments in autism spectrum disorder assessment of children and adults in Scotland. Research in Autism Spectrum Disorders. 2016;29–30:93–100. doi: https:/doi.org/10.1016/j.rasd.2016.05.003
23. The American Occupational Therapy Association. Occupational therapy practice framework: Domain & process fourth edition. American Occupational Therapy Association Bethesda; 2020.
24. Durkin MS, Elsabbagh M, Barbaro J, Gladstone M, Happe F, Hoekstra RA, Lee LC, Rattazzi A, Stapel-Wax J, Stone WL, et al. Autism screening and diagnosis in low resource settings: Challenges and opportunities to enhance research and services worldwide. Autism Research. 2015;8(5):473–476. doi: https:/doi.org/10.1002/aur.1575
25. Kadar M, Mcdonald R, Lentin P. Evidence-based practice in occupational therapy services for children with autism spectrum disorders in Victoria, Australia. Australian Occupational Therapy Journal. 2012;59(4):284–293. doi: https:/doi.org/10.1111/j.1440-1630.2012.01015.x
26. Chambers NJ, Wetherby AM, Stronach ST, Njongwe N, Kauchali S, Grinker RR. Early detection of autism spectrum disorder in young isiZulu-speaking children in South Africa. Autism. 2017;21(5):518–526. doi: https:/doi.org/10.1177/1362361316651196
27. Sulek R, Trembath D, Paynter J, Keen D, Simpson K. Inconsistent staffing and its impact on service delivery in ASD early-intervention. Research in Developmental Disabilities. 2017;63:18–27. doi: https:/doi.org/10.1016/j.ridd.2017.02.007
28. Jejelaye A, Maseko L, Franzsen D. Occupational therapy services and perception of integration of these at primary healthcare level in South Africa. South African Journal of Occupational Therapy. 2019 Dec;49(3):46-53.
29. Schreibman L, Dawson G, Stahmer AC, Landa R, Rogers SJ, McGee GG, Kasari C, Ingersoll B, Kaiser AP, Bruinsma Y, et al. Naturalistic Developmental Behavioral Interventions: Empirically Validated Treatments for Autism Spectrum Disorder. Journal of Autism and Developmental Disorders. 2015;45(8):2411–2428. doi: https:/doi.org/10.1007/s10803-015-2407-8
30. Landa RJ. Efficacy of early interventions for infants and young children with, and at risk for, autism spectrum disorders. International Review of Psychiatry. 2018;30(1):25–39. doi: https:/doi.org/10.1080/09540261.2018.1432574
31. Vinen Z, Clark M, Paynter J, Dissanayake C. School Age Outcomes of Children with Autism Spectrum Disorder Who Received Community-Based Early Interventions. Journal of Autism and Developmental Disorders. 2018;48(5):1673–1683. doi: https:/doi.org/10.1007/s10803-017-3414-8
32. Franz L, Adewumi K, Chambers N, Viljoen M, Baumgartner JN, de Vries PJ. Providing early detection and early intervention for autism spectrum disorder in South Africa: stakeholder perspectives from the Western Cape province. Journal of Child and Adolescent Mental Health. 2018;30(3):149–165. doi: https:/doi.org/10.2989/17280583.2018.1525386
33. Estes A, Swain DM, MacDuffie KE. The effects of early autism intervention on parents and family adaptive functioning. Pediatric Medicine. 2019;2(April):21–21. doi:https:/doi.org/10.21037/pm.2019.05.05
34. Ashburner J, Rodger S, Ziviani J, Jones J. Occupational therapy services for people with autism spectrum

disorders: current state of play, use of evidence and future learning priorities. Australian occupational therapy journal. 2014;61(2):110–120. doi: https:/doi.org/10.1111/1440-1630.12083
35. Thompson-Hodgetts S, Magill-Evans J. Sensory-based approaches in intervention for children with autism spectrum disorder: Influences on occupational therapists' recommendations and perceived benefits. American Journal of Occupational Therapy. 2018;72(3). doi: https:/doi.org/10.5014/ajot.2018.024729
36. James LW, Pizur-Barnekow KA, Schefkind S. Online survey examining practitioners perceived preparedness in the early identification of autism. American Journal of Occupational Therapy. 2014;68(1):e13–e20. doi: https:/doi.org/10.5014/ajot.2014.009027
37. Malterud K, Siersma VD, Guassora AD. Sample Size in Qualitative Interview Studies: Guided by Information Power. Qualitative Health Research. 2016;26(13):1753–1760. doi: https:/doi.org/10.1177/1049732315617444
38. South African Government. Regulations and Guidelines - Coronavirus COVID-19 | South African Government. 2020.
39. Moser A, Korstjens I. Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. European Journal of General Practice. 2018;24(1):9–18. doi: https:/doi.org/10.1080/13814788.2017.1375091
40. Lowe A, Norris AC, Farris AJ, Babbage DR. Quantifying Thematic Saturation in Qualitative Data Analysis. Field Methods. 2018;30(3):191–207. doi: https:/doi.org/10.1177/1525822X17749386
41. Babbie J, Mouton E. The practice of social research. Cape Town: .: Oxford University Press Southern Africa; 2001.
42. Traboulsi EI, Maurhenee IH. Ophthalmologic findings in mucolipidosis III (pseudo-hurler polydystrophy). 1986. doi: https:/doi.org/10.1016/0002-9394(86)90529-5
43. The Makaton Charity. Makaton. 2022. https:/makaton.org/
44. Bondy AS, Frost LA. The Picture Exchange Communication System. Focus on Autism and Other Developmental Disabilities. 1994;9(3):1–19. doi: https:/doi.org/10.1177/108835769400900301
45. Greenspan SI, Wieder S. The developmental individual-difference, relationship-based (DIR/Floortime) model approach to autism spectrum disorders. Clinical manual for the treatment of autism. 2007:179–209.
46. Frick S, Hacker C. Listening with the whole body: Clinical concepts and treatment guidelines for Therapeutic Listening. Madison: Vital Links; 2001.
47. Robins DL, Fein D, Barton M. Modified Checklist for Autism in Toddlers , Revised , with Follow-Up (M-CHAT-R / F) TM. 2009. https:/drexel.edu/~/media/Files/autismInstitute/EDI/M-CHAT-R_F.ashx
48. Schopler E, Van Bourgondien, ME Wellman G, Love S. Childhood Autism Rating Scale 2. Western Psychological Services. 2010. https:/www.carautismroadmap.org/childhood-autism-rating-scale/
49. Rosenbaum M, Gabrielsen TP. Decision factors for community providers when referring very young children for autism evaluation. Research in Autism Spectrum Disorders. 2019;57(March 2018):87–96. doi: https:/doi.org/10.1016/j.rasd.2018.09.009
50. Kaur M, M. Srinivasan S, N. Bhat A. Comparing motor performance, praxis, coordination, and interpersonal synchrony between children with and without Autism Spectrum Disorder (ASD). Research in Developmental Disabilities. 2018;72:79–95. doi: https:/doi.org/10.1016/j.ridd.2017.10.025
51. Wallace K, Franzsen D, Potterton J. Development of an Occupational Performance Questionnaire for preschool children with Autistic Spectrum Disorder. South African Journal of Occupational Therapy. 2016;46(2):23–30. doi: https:/doi.org/10.17159/2310-3833/2016/v46n2a5
52. Lord C, Luyster R, Gotham K, Guthrie W. Autism Diagnostic Observation Schedule. Torrance: Western Psychological Services; 2012. doi: https:/doi.org/10.1007/springerreference_184220
53. Robins D. MCHAT Translations. 2022. https:/mchatscreen.com/mchat-rf/translations/
54. Naidoo D, Van Wyk J, Joubert RWE. Exploring the occupational therapist's role in primary health care: Listening to voices of stakeholders. African journal of primary health care & family medicine. 2016;8(1):e1–e9. doi: https:/doi.org/10.4102/phcfm.v8i1.1139
55. Salomone E, Beranová Š, Bonnet-Brilhault F, Briciet Lauritsen M, Budisteanu M, Buitelaar J, Canal-Bedia R, Felhosi G, Fletcher-Watson S, Freitag C, et al. Use of early intervention for young children with autism spectrum disorder across Europe. Autism. 2016;20(2):233–249. doi: https:/doi.org/10.1177/1362361315577218
56. Patriquin M, MacKenzie D, Versnel J. Occupational Therapy Interventions for Restricted and Repetitive Behaviors in Children with Autism Spectrum Disorder. Occupational Therapy in Mental Health. 2020;36(1):85–104. doi: https:/doi.org/10.1080/0164212X.2019.1662361
57. Nielsen SK, Hektner JM. Understanding the psychosocial knowledge and attitudes of school-based occupational therapists. Journal of Occupational Therapy, Schools, and Early Intervention. 2014;7(2):136–150. doi: https:/doi.org/10.1080/19411243.2014.930615
58. Akhter N, Mumtaz N, Saqulain G. Autism cognizance: A dilemma among medical and allied medical practitioners. Pakistan Journal of Medical Sciences. 2020;36(4):678–682. doi:https:/doi.org/10.12669/pjms.36.4.1703
59. Tanner K, Hand BN, O'Toole G, Lane AE. Effectiveness of interventions to improve social participation, play, leisure, and restricted and repetitive behaviors in people with autism spectrum disorder: A systematic review. American Journal of Occupational Therapy. 2015;69(5). doi: https:/doi.org/10.5014/ajot.2015.017806
60. Martínez-Pedraza F de L, Carter AS. Autism Spectrum Disorders in Young Children. Child and Adolescent Psychiatric Clinics of North America. 2009;18(3):645–663. doi:https:/doi.org/10.1016/j.chc.2009.02.002
61. Juraszek, K., Kalisz, Z., Maszudzińska, A., Kucharczuk, M. and Kalisz, J. 2019. Healthcare professionals knowledge of autism spectrum disorders. Journal of Education, Health and Sport, 9(8), pp.103-120 doi: http:/dx.doi.org/10.5281/zenodo.3371694
62. Health Professions council of South Africa. The minimum Standards for the Training of occupational therapists. 2020

Empathy and associated influencing factors in occupational therapy students: A cross-sectional study

AUTHORS

Lisa-Mari de Klerk[a,f]
https:/orcid.org/0000-0002-7576-510X
Monia Kramer[b,f]
https:/orcid.org/0000-0001-8621-1607
Bianca Pieterse[c,f]
https:/orcid.org/0000-0002-8186-4550
Kirsten Anne Smith[d,f]
https:/orcid.org/0000-0002-6257-7396
Anri van Tiddens[e,f]
https:/orcid.org/0000-0001-8757-4370
Anthea Jansen[f]
https:/orcid.org/0000-0001-6291-1801
Omololu Aluko[g]
https:/orcid.org/0000-0002-6944-6532

AFFILIATIONS

[a]Letitia Delport Occupational Therapy, Bloemfontein, South Africa
[b]Rene de Bruin Occupational Therapy, Bloemfontein, South Africa
[c]Annerina vd Merwe Occupational Therapy Inc., Bloemfontein, South Africa
[d]Greenhough Occupational Therapy Inc., Pietermaritzburg, South Africa
[e]Janke van der Walt Occupational Therapy, Vredenburg, South Africa
[f]Department of Occupational Therapy, University of the Free State, South Africa
[g]Department of Biostatistics, University of the Free State, South Africa

CORRESPONDING AUTHOR

Anthea Jansen
jansenANB@ufs.ac.za

KEYWORDS

Interpersonal Reactivity Index, students' empathy levels, occupational therapy curriculum and training, clinical fieldwork, Covid-19 pandemic impact

HOW TO CITE THIS ARTICLE

de Klerk L, Kramer M, Pieterse B, Smith KA, van Tiddens A, Jansen A, Aluko O. Empathy and associated influencing factors in occupational therapy students: A cross-sectional study. South African Journal of Occupational Therapy, Volume 53 No 2, August 2023.
DOI: https:/doi.org/10.17159/2310-3833/2023/vol53n2a4

ARTICLE HISTORY

Submitted: May2022
Review: July2022
Accepted: September 2022
Published: August 2023

EDITOR

Blanche Pretorius
https:/orcid.org/0000-0002-3543-0743

DATA AVAILABILITY

From corresponding author

FUNDING

None

ISSN On-line 2310-3833

ABSTRACT

Introduction: Empathy, often described as the comprehension of another person's state of mind, enables one to appreciate social environments and anticipate others' behaviour. In occupational therapy, the therapeutic use of self, which is grounded in empathy, is commonly considered essential, as it enables therapists to manage a therapeutic relationship with clients. However, high caseloads, stressors and pressure to perform often impact empathy levels. This study aimed to determine the empathy levels of undergraduate occupational therapy students, as well as factors affecting empathy levels.
Method: A quantitative approach was used, with an observational, cross-sectional study methodology, employing an electronic survey consisting of the Interpersonal Reactivity Index (IRI) and a questionnaire developed by the researchers.
Results: In total, 112 (response rate 70.4%) students participated in the study. Overall, the students had a satisfactory level of empathy. Of concern, however, was the impact of the Covid-19 pandemic and the lack of clinical fieldwork experience, which possibly contributed to the lower empathy levels observed among second-and third-year students.
Conclusion: From the findings, it is suggested that more attention should be given to empathy, as it plays an integral role in practice with clients, as well as in the training of occupational therapy students.

Implications for practice

The findings suggest the opportunity for interventions and support systems that can help students manage high caseloads, stressors, and performance pressures, while also fostering and maintaining empathy. Implementing strategies such as stress management programs, mindfulness training, and self-care initiatives can help mitigate the negative impact on empathy levels and promote the development of empathetic skills in future occupational therapists.

The research study's results have implications for the professional practice of occupational therapy. It emphasizes the need for ongoing education and training programs that focus on empathy development and maintenance throughout a therapist's career.

By providing therapists with the tools, resources, and support to sustain their empathy levels in challenging work environments, the study suggests that the quality of care provided to clients can be enhanced, leading to better therapeutic outcomes and overall client satisfaction.

Organizational changes within healthcare settings may be necessary to address workload issues and create a supportive environment that nurtures empathy among occupational therapy professionals.

INTRODUCTION

Empathy has no script. There is no right way or wrong way to do it. It's simply listening, holding space, withholding judgment, emotionally connecting, and communicating that incredibly healing message of 'You're not alone' [1:internet]

Empathy is difficult to define[2]. It is a versatile, complex and dynamic concept

resulting from the various interpretations thereof[3]. Throughout this study, empathy was operationally defined by the Interpersonal Reactivity Index (IRI) as the "reactions of one individual to the observed experiences of another"[4:internet]. Empathy has been described as consisting of a set of facets that reflect individual cognitive and emotional experiences of concern for others, compassion, warmth and individual feelings of discomfort and anxiety from observing others' negative experiences[5,6].

Empathy plays a critical role in the formation of meaningful relationships in society[7]. It enables the understanding of the mental states of others, including their emotions, aspirations, behaviours and thoughts[8]. The therapeutic use of self, regarded as a cornerstone in occupational therapy practice, is considered to be an essential part of the therapeutic process as it enables the therapist to develop and manage a therapeutic relationship with their clients[9]. According to the Occupational Therapy Practice Framework (OTPF), possessing empathy as a therapist is essential to enable the therapeutic use of self, as it allows more open communication between the therapist and the client[9]. Client is defined by the Merriam-Webster Dictionary as "a person who engages the professional advice or services of another,"[10:internet] whereas the term patient is defined as "an individual awaiting or under medical care and treatment; the recipient of any of various personal services"[10:internet]. These two terms are used interchangeably throughout this article.

Research has shown that healthcare practitioners who interact with their patients in an empathic manner, can contribute to an increase their patients' comfort, are able to build trusting relationships with them and encourage clients to adhere to their treatment programmes[11–15]. Healthcare practitioners refer to individuals who support health and well-being in people through the implementation and administration of the principles and procedures of evidence-based practice[16]. Additionally, empathic interactions enable the therapist to connect with the client on an emotional level, which will contribute to the enhancement of their current life situation[9]. This level of involvement ultimately results in improved client outcomes[2].

However, high caseloads, stressors and pressure to perform and be successful in treating clients often have a negative influence on empathy levels[17]. Clients, or patients, who are dissatisfied with practitioners due to a lack of empathy, lead to feelings of distress and this may cause them to lose faith in the healthcare system, whereas the presence of empathy results in feelings of satisfaction, relief and trust[13]. Furthermore, it has been noted that in addition to empathy declining during the course of studying in a healthcare-related field, countless students fail to recognise the value of this important skill concerning their future profession[18]. Thus, it is important to encourage and inculcate the importance of empathy among students before these pressures take hold and control their quality-of-service delivery[19].

Contrary to the literature indicating a decline in empathy during the course of study, multiple other studies have produced results suggesting that not only is the decline in medical students' empathy levels "over-exaggerated", but it also oscillates in the opposite direction, with empathy levels having been reported to increase as students' progress through the years of medical training[20–23]. These contradicting results from multiple studies provided a rather unclear conclusion pertaining to the possible increase and/or decline in the empathy levels of medical and health sciences students.

The available literature further demonstrates a lack of research with regard to the levels of empathy among occupational therapists (and particularly students) within the South African context. When searching the literature, only a single study conducted at an Australian University in 2010 that measured the empathy levels of occupational therapy students, could be located[20]. More recently, another study, also from an Australian University, using the Emotional and Social Competency Inventory to compare the emotional and social competence among the baccalaureate occupational therapy students across four academic year levels[24], was published. The results indicated that subscale scores on teamwork, empathy and achievement orientation were the three competencies receiving the highest scores[24].

These contradictory results and inadequate research in a South African context indicated the need to measure empathy levels to implement changes to the curricula based on the findings and instill the importance of empathy in students. The value of this study as a mechanism for skills development in student training is founded on the notion that empathy is a skill. As early as 1976, Keefe[25] suggested that empathy is a set of behaviours that accounts for a skill crucial to the successful treatment of a patient. He went on to say that behaviours constituting the empathic skill are acquired throughout life and include feeling, thinking, perceiving, and communicating[25]. Thus, empathy used to be considered as merely an innate characteristic that could not be taught, but studies have indicated that this essential human capacity is susceptible to change, therefore, progressing to a characteristic capability that can be taught[19].

This study aimed to measure, describe and compare the levels of empathy of all four undergraduate year groups at the University of the Free State by using a standardised empathy measure, the Interpersonal Reactivity Index (IRI), as well as a questionnaire developed by the researchers. The study sought to determine whether differences in the empathy levels of the different year groups were present, and which year groups, respectively, had the highest and lowest empathy levels.

LITERATURE REVIEW

Empathy

Empathy is considered a complex and multidimensional concept to define[3], mostly due to various schools of thought (i.e., sociological, psychological and medical fields), each having their own perspective and understanding thereof. For example, in the 1950s, Carl Rogers, an influential psychologist, dominated the formulation of the definition of empathy in social services. Most of the definitions of empathy at that time were derived from Rogers' explanation of empathy as the therapist's ability "to sense the client's private world as if it were your own, but without ever losing the 'as if' quality"[26:99]. Furthermore, the definition of empathy in the

context of client care and medical education assumed a more "component-based" perspective of empathy, with Hojat and Gonnella[27:344] describing it as "predominantly a cognitive attribute (as opposed to affective) that involves understanding (as opposed to feeling) of the patient's pain, experiences, concerns, and perspectives combined with a capacity to communicate this understanding and an intention to help". Theorists and seminal authors of empathy have come to a relative consensus, implying that there are various components to empathy[28].

Components of empathy

As previously mentioned, empathy is not an exclusive phenomenon, as it comprises different forms and aspects[8]. Many theorists have proposed that various "components" are part of empathy, namely those of affective (empathy related to emotions and one's emotional state), cognitive (the intentional and conscious act of perspective-taking and thinking), behavioural (the act of showing empathy, such as attentive listening, for example) and moral empathy (the willingness of an individual to care for and improve an individual's situation through altruism)[8,17,18]. As empathy is such a complex and multidimensional concept[3], it is necessary to identify the different components that empathy consists of, and to understand each component individually and how it contributes to empathy as a whole, in order to comprehend and react to the hardships experienced by another person[17,29]. These components facilitated the identification of factors that required focus when attempting to measure empathy levels among students.

The measurement of empathy introduces a burdensome task that originates from the lack of a clear, universal definition of empathy[30]. The measures used in investigating empathy levels can be separated into three classes: self-report instruments, behavioural observational techniques and neuroscientific procedures[30].

Empathy and occupational therapy

World Wars I and II created a significant demand to develop the speciality of rehabilitation medicine in order to aid returning war veterans with disabilities and help them to recover function and reintegrate into society[31]. The early growth and development of occupational therapy as a health-related discipline occurred within this culture of rehabilitation medicine[31]. In occupational therapy, the therapist-client relationship is characterised by a blend of competence and caring or empathy[31]. Pierce believed that the humanistic values, that exist within occupational therapy culture, are in direct opposition to the values of medicine and that an even balance of competence and caring results in the highest quality of a therapeutic relationship[31].

In many settings where occupational therapy services are provided, the delivery thereof is guided by the Occupational Therapy Practice Framework: Domain and Process (OTPF)[9]. The OTPF was designed not only for occupational therapists and occupational therapy students, but also for other healthcare practitioners, educators, researchers and consumers. The OTPF provides a summary of interdependent concepts that are relevant to occupational therapy practice[9]. It emphasises the importance of the inclusion of possessing empathy, practising client-centred therapy and collaborating with the client[32]. Thus, according to this framework, an occupational therapist needs to possess empathy when providing services to clients.

Additionally, the Health Professions Council of South Africa (HPCSA) formulated and presented thirteen core ethical values and standards required for good practice. One of the core ethical values required is compassion, which the HPCSA describe as health care practitioners' ability to be sensitive to, and empathise with, the individual and social needs of their patients, as well as to create mechanisms for providing comfort and support where appropriate and possible[33]. These specific values are perceived as all-inclusive ethical aspects required of a healthcare practitioner to maintain good professional practice, therefore, compassion or empathy is viewed as a necessity in practice in any healthcare setting.

Previously, empathy was regarded as an instinctive, inborn characteristic that could not be taught. However, research has indicated that this essential human ability is capable of change, which contributes to its teachability[17]. Viewed as a range of behaviours, the empathic skill becomes more attainable, in the sense that like all behaviours, it can be taught and learned. As early as the 1970s, various approaches, some using the empathy scales of Truax or Carkhuff, for example, have been established for teaching empathy in practice, such as providing students with feedback on the level of empathy they were demonstrating in role-played or recorded interviews situations[25]. Hegazi, Hennessy and Wilson[23] emphasised the fundamental significance of schools educating students on the significance of empathy. The acquisition of relevant knowledge and the application of this information in the intervention of clients is vital, although an equally essential skill in treatment is the ability to relate successfully to one's clients[23]. Students' capability for effective communication during interviews with clients requires a different skill set, including the capacity to comprehend patients' emotions and circumstances (i.e., empathy) and the ability for introspection and understanding one's own feelings and emotional reactions in response to patients' circumstances and actions (i.e., self-awareness)[23]. Furthermore, Hegazi *et al.* stated that empathy in a medical setting is an essential skill and a core component of "professionalism"[23].

In addition to empathy being considered a professional virtue, many studies reported multiple benefits experienced by both healthcare practitioners and their clients when empathy had been demonstrated in a therapeutic relationship. Research has produced conclusive evidence suggesting that empathy is a "powerful tool", with many positive advantages in client care[23]. For example, for both therapists and students, it is of particular value to be empathic as it facilitates a client-centred understanding to ensure that the client pursues meaningful occupation and attains all therapeutic outcomes[19]. Additionally, having empathy also provides one with job satisfaction[11]. Moreover, empathy in client care, such as verbal communication and understanding non-verbal cues, as well as time spent with

the client, can increase client satisfaction and compliance[34]. Empathic care enhances clients' perceptions of being helped, improves their feelings of empowerment and increases their experiences of a support network[34].

Concerning an example that is fitting to recent circumstances, research has indicated that the COVID-19 pandemic had influenced empathy levels globally[35]. In the present healthcare setting, affective empathy, more specifically, was suggested to enhance health-related outcomes. Additionally, it was found to encourage healthcare practitioners' compliance with handwashing in order to protect others in hospitals[36]. Additionally, literature emphasised the importance of maintaining a balance by ensuring that healthcare practitioners are equally provided with sufficient support, care and empathy from their establishments, to enable them to provide high-quality, empathic services, and to ensure that they experience the benefits of empathy themselves[37].

Furthermore, the absence of empathy in healthcare negatively impacts the therapeutic relationship[8,13,25]. It has been suggested in the literature that occupational therapy students' style of clinical practice is influenced by their empathy levels, whereas lower levels of empathy ultimately make them more vulnerable to work-related stress and consequent burnout[38]. Consequently, a lack of empathy can result in clients becoming reluctant to return and adhere to their treatment programmes[13]. Furthermore, inadequate empathy can lead to disappointment in the healthcare system or an increase in malpractice litigations[13]. Research has emphasised that a practitioner who is non-empathic could potentially cause more harm to a client's wellbeing and health than not consulting a practitioner at all[39].

Hence, as noted above, high caseloads, stressors and pressure to perform and successfully treat clients are factors that have been proven often to negatively influence empathy levels[19]. Additionally, studies have shown a probable trend of decline in empathy levels not only among medical students, but healthcare students in general. This observation has been attributed to several reasons, such as extreme emotional and academic pressure, exposure to clinical settings, burnout and dissatisfaction with one's chosen profession or field of study[15]. The concepts of empathy and the ability to "experience" and relate to another individual's pain, becoming eroded could be found to be prominent, not only among physicians, but also among other healthcare professionals. In their daily business of treating clients, occupational therapists and students are also exposed to the pain and traumatic experiences of these individuals. Thus, occupational therapists are also at risk of being "emotionally exploited" within clinical settings, which may lead to a decrease in their levels of empathy.

On the contrary, other studies have suggested that the empathy levels of students in various healthcare professions may remain unchanged or that it may oscillate in the opposite direction, with empathy levels having been reported to increase as students progress through the years of medical training[23]. Such contradictory information indicates that no firm and conclusive evidence has been drawn to determine whether a definite increase or decrease in the level of empathy occurs among students in healthcare professions, specifically in the occupational therapy profession.

It is evident from the literature that empathy in a healthcare setting has multiple benefits for both healthcare practitioners and their clients. This knowledge contributed to contextualising the study, as it had been identified that empathy is a necessary component for client care, consequently demonstrating the importance of investigating the empathy levels of occupational therapy students at the University of the Free State. The study would ultimately contribute to ensuring that these students will approach their clients with the necessary empathy when providing their therapy.

Doris Pierce, a renowned occupational therapist, stated that to understand the occupations of others better, "... we must become very skilled at methods to gain access to the perspectives of others. Such methods include empathy, reflection, interview, observation, and rigorous qualitative inquiry."[40:304]. From the literature, it is evident that empathy necessitates careful consideration, not only in practice with clients, but also in the training of occupational therapy students.

METHODS

Study design

An observational, cross-sectional study methodology was used by employing an electronic survey of the Interpersonal Reactivity Index (IRI) and a questionnaire custom-developed for the purpose of the study, both of which were administered to the students.

Research participants

All the undergraduate students enrolled in the occupational therapy course at the UFS were requested to participate. Because the entire population was represented, no sampling method was necessary. The population of 159 occupational therapy students included both male and female students between 18 and 38 years of age. The UFS offers a four-year Bachelor of Occupational Therapy degree.

Measurement instruments

The IRI and the questionnaire that was developed by the researchers were used to measure and determine the empathy levels of the students. Table I (page 36.) lists the references used for the compilation of the questionnaire.

The standardised IRI, with proven validity and reliability, is a 28-item scale including four subscales, each comprising seven items. The four subscales include the Fantasy scale (FS), Perspective-Taking (PT) scale, the Empathic Concern (EC) scale and the Personal Distress (PD) scale. FS explains the probability of an individual relating to a fictional character; it measures respondents' tendencies to transpose themselves imaginatively into the actions and feelings of fictitious characters in movies, books and plays[4,5]. PT relates to the cognitive component of empathy as it evaluates unintended, spontaneous efforts to assume others' points of view[4,5]. EC scale refers to individuals' feelings of compassion and concern for others, thus, assessing "other-orientated"

Table I: References for the sources that informed some of the questions included in the questionnaire developed by the researchers

Sources used to compile the self-developed questionnaire		Questions informed by the specific source
Ref. No.	**Reference**	
41	Komeda H, Kosaka H, Fujioka T, Jung M, Okazawa H. Do individuals with autism spectrum disorders help other people with autism spectrum disorders? An investigation of empathy and helping motivation in adults with autism spectrum disorder. Frontiers in Psychiatry. 2019;10:376.	Question 1.8: Have you been formally diagnosed with an autism spectrum disorder?
42	Hojat M, Spandorfer J, Louis DZ, Gonnella JS. Empathic and sympathetic orientations toward patient care: conceptualization, measurement, and psychometrics. Academic Medicine. 2011;86(8):989–995.	Question 2.1: What is your understanding of empathy? Please select the relevant option.
17	Riess H. The science of empathy. Journal of Patient Experience. 2017;4(2):74–77.	Question 2.3: Do you regard empathy as a skill, or is it an inborn trait?

feelings of concern for unfortunate others[4,5], which relates to the affective component of empathy. PD indicates the extent to which an individual feels uneasiness, or worry when exposed to the negative experiences of others, thus, measuring "self-orientated" feelings of personal anxiety and unease within tense interpersonal settings[4,5], which relates to the moral component of empathy. Therefore, this empathy measurement instrument covers three of the four components of empathy described in the literature review (affective, cognitive, behavioural and moral empathy).

Additionally, the IRI was chosen as it is the most frequently used self-report measure of its kind and purportedly addresses the emotional as well as the cognitive aspects of empathy[5,29,43], which are not covered by most other empathy measures. The IRI was developed by Mark H. Davis[5], a professor of psychology at Eckerd College, thus, this empathy measure originated from the Psychology discipline. However, since the IRI was intended to be a multidimensional measure of empathy, designed to measure individual disparities in cognitive, perspective-taking proclivities, as well as variations in the sort of emotional responses typically demonstrated[6], it would be relevant to measure the empathy levels of occupational therapy students. The IRI has been extensively utilized within medical and health contexts, on a variety of individuals (e.g. residents, medical students, nurses, physicians, dentists), with several fascinating results, indicating its utility and validity within these milieus[44].

Students rated their level of agreement with each statement on the IRI on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Nine of the twenty-eight questions are negatively worded in order to decrease the confounding effect of submissive responding, which were reversed afterwards for analysis. Thereafter, the mean score for each subscale was calculated. These scores were used to determine the mean scores for each year group that were compared to reveal differences and similarities in empathy levels among the different year groups.

Secondly, concerning the self-developed questionnaire, information was obtained from the respondents' feedback provided to the questions included in the questionnaire. The questions were both open- and closed-ended questions aimed to determine the demographic characteristics of the students (e.g. age, year of study, having to repeat a year of study), background information (e.g., their knowledge about the subject of empathy, their attitude towards empathy) and students' perceptions of the impact of the COVID-19 pandemic on their empathy levels. Participants were asked to select options that were the most applicable to themselves, and to provide more information by typing in certain answers.

Measurement procedures

A pilot study was conducted with eight students (two from each of the year groups) to determine possible errors in the data collection, administering and scoring of the IRI and the self-developed questionnaire. Additionally, the pilot study provided the researchers with an understanding of the students' comprehension of the questions and the ability to provide accurate responses. These students' findings were included in the data analysis as no changes to the questionnaire were required.

When invited to participate in the study, students were provided with an explanatory statement and informed that participation was voluntary and anonymous, through the use of an information and consent form made available by means of email and WhatsApp messages to each of the year groups. A link to the online survey was included in these messages. Consent was implied by the completion of the questionnaire. The researchers administered the survey online via the EvaSys platform.

A total of 43 questions (IRI and questionnaire combined) were completed, which took approximately 20 minutes. The online survey was available for completion by the students for two weeks. The researchers invited the participants via email and WhatsApp messages weekly to complete the survey and also one day before the cut-off date.

Data analysis

The data were collected via the EvaSys online survey platform, which ensured the confidentiality and anonymity of all the information obtained. The data were available for download from EvaSys as a CVS file, i.e., an Excel spreadsheet. Thereafter, the data for each year group were typed into a Microsoft Excel spreadsheet, thereby de-identifying the data obtained. The completed questionnaires were divided, among the researchers, as per the respective year groups.

Data analysis was performed by the Department of Biostatistics, UFS, using SAS software version 9.4 (SAS Institute Inc.; Cary, NC). Descriptive statistics, namely frequencies and percentages for categorical data, and medians and percentiles for numerical data, were calculated. A chi-squared test was conducted with $p<0.05$ regarded as

Table II: Mean scores* for each of the subscales of the Interpersonal Reactivity Index (IRI) per year group

Subscale of the IRI	Year group				Total group (n=112)
	1st (n=22)	2nd (n=17)	3rd (n=38)	4th (n=35)	
Fantasy Scale (FS)	3.92	3.87	3.64	3.81	3.81
Perspective-Taking Scale (PT)	3.87	3.88	3.97	4.14	3.97
Empathic Concern Scale (EC)	4.29	4.12	4.23	4.40	4.26
Personal Distress Scale (PD)	2.56	2.61	2.67	2.73	2.64

***Converted from a 1–5 Likert scale to summed scores.**

Table III: The probability (p-value) of an association between student empathy levels and different variables

Variables	p-value per year group			
	1st (n=22)	2nd (n=17)	3rd (n=38)	4th (n=35)
Repeating a year of occupational therapy training	0.5518	–	0.3339	0.4101
Treating clients	0.4685	0.6711	0.7541	–
Occupational therapy training	0.3021	0.3854	0.6780	0.1346
COVID-19 pandemic	0.4267	0.2670	0.2377	0.7161

Note: Where a dash (–) has been used, the variables could not produce results of association with any other variable, due to those respective values being single numbers in the data set.

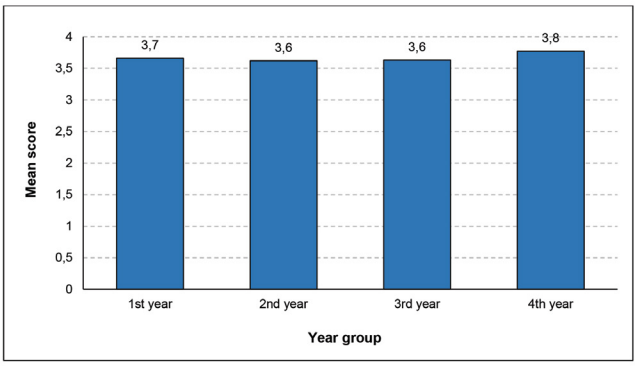


Figure 1: Empathy level scores per year group (n=112).

statistically significant.

Ethical considerations

The study adhered to the ethical guidelines set by both the Department of Occupational Therapy at the UFS and the Health Sciences Research Ethics Committee (HSREC) of the university. Ethical approval to perform the study was obtained prior to the commencement of the research (ethical clearance number UFS-HSD2021/0103/2004).

RESULTS

A total of 112 students from the total population of 159 participated in the study (70.4% response rate). The majority of students were between the ages of 18 to 23 years (90.2%). Students from each of the four year groups were adequately represented in the sample for statistical analysis, with 22 (19.6%) first-year, 17 (15.2%) second-year, 38 (33.9) third-year and 35 (31.3%) fourth- (final-) year students.

The scores of each of the IRI subscales were determined for the respective year groups. Table II (above) indicates the mean scores for each of the four subscales of the IRI per year group and the combined mean score for a particular subscale.

A chi-square test was performed to determine whether significant differences between students' empathy levels occurred. The variables included repeating a year of occupational therapy training, treating clients, occupational therapy training and the COVID-19 pandemic. Referring to the first-mentioned variable, repeating a year(s) of occupational therapy training increases the total time spent in the program, thus, the potential of that having an influence (whether positive or negative) evoked investigation. Secondly, as described in the literature review, encounters with patients influence the empathy levels of healthcare practitioners, thus, an association with this variable urged an investigation. Thirdly, as this study aimed to determine the empathy levels of occupational therapy students, the influence of occupational therapy training on empathy levels had to be inspected. Lastly, as the study was executed amidst the global COVID-19 pandemic, the authors wanted to investigate the association between the pandemic and the students' empathy levels. The results are summarised in Table III (above).

The mean scores for each subscale were averaged to reveal the aggregate score for each of the respective year groups' empathy levels. Figure 1 (above) illustrates the average empathy level of each year group.

Of the 112 participants, nine students have repeated at least one year of occupational therapy training (first-year n=3 [2.7%]; third-year n=2 [1.8%]; fourth-year n=4 [3.6%]). Of these nine students, six (66.7%) participants felt that repeating a year of occupational therapy training might have had a positive impact on their empathy towards others.

Ninety-two (82.1%) of the students reported having worked with a patient or client as part of their occupational therapy training. Overall, most students (n=102, 91.1%) indicated a good understanding of the concept of empathy, namely that empathy is "the ability to understand and share the

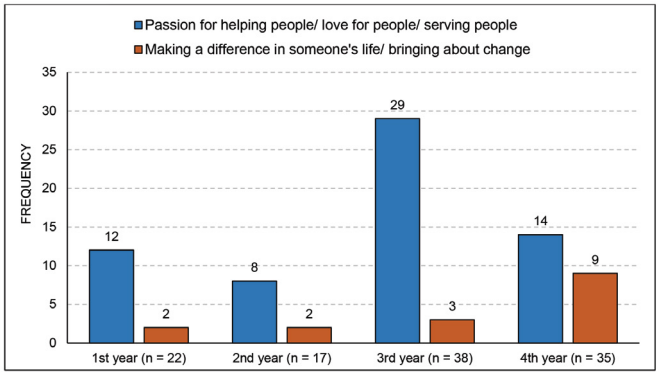


Figure 2: Most common reasons for choosing to study occupational therapy.

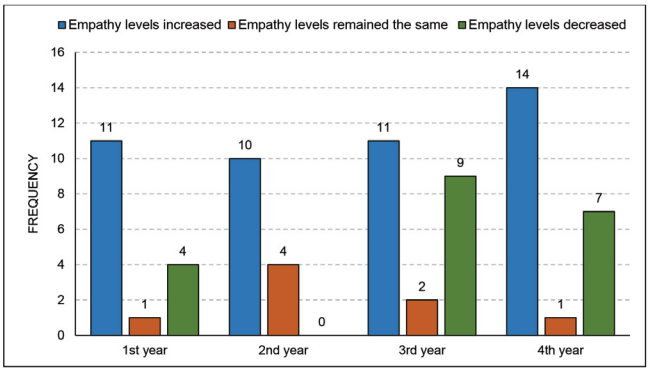


Figure 3: Students' perceptions of what impact the COVID-19 pandemic had on their empathy levels (n=74).

Table IV: Most common reasons provided for the increase or decrease in empathy levels during the COVID-19 pandemic

	Year group			
	1st	2nd	3rd	4th
Reasons why empathy levels increased during the pandemic and percentage (%) respondents (n=46)				
All faced the same hardships/experienced similar things.	9.1	18.2	15.9	18.2
Many people (or they) lost loved ones to Covid-19.	11.4	4.6	0	0
Increased awareness of other people's experiences and situations.	0	0	6.8	13.6
Reasons why empathy levels decreased during the pandemic and percentage (%) respondents (n=21)				
People became more self-absorbed – focusing on their own problems and experiences.	14.3	4.8	9.5	4.8
Decreased clinical exposure – decreased contact with patients.	0	14.3	4.8	23.8
Less contact with people.	4.8	0	19.1	0

feelings of another."

Seventy (62.5%) students indicated that they regarded empathy as a specific skill that can be taught to people, whereas 42 (37.5%) students felt that empathy is an inborn trait and a person is either born with or without it. The majority of students (n=107, 95.5%) felt that empathy is important in pursuing a career such as occupational therapy. Of these 107 respondents, 60 (56.1%) attributed the importance of empathy to the fact that it enables an understanding of your patient or client.

The students were asked, using an open-ended question, to elucidate why they chose to study occupational therapy. The responses provided served as categories; respondents' answers were grouped under the various categories that emerged from the data based on the similarity of the responses. New responses served as additional categories. The two most frequent reasons that informed their choice of study are indicated in Figure 2 (above).

Overall, students' perceptions of their empathy levels were indicated as having either an excessive (n=43, 38.4%) or sufficient (n=68, 60.7%) level of empathy. Only one (0.9%) student perceived their empathy level as poor. The majority of students (n=92, 82.1%) felt that the way in which they responded to people or patients had changed since they started studying occupational therapy. Students from each of the four year groups were adequately represented in this response (first-year 17.39%, second-year 16.30%, third-year 31.52%, fourth-year 34.78%).

Eighty-four (75.0%) students indicated that they expect their empathy levels to increase during the course of study, six (5.4%) students believed that empathy levels will remain unchanged and 22 (19.6%) students expected their empathy levels to decrease during the course of their study.

Of the 84 students that indicated that they expect empathy levels to increase across the years of study, 44 (52.4%) respondents attributed this anticipated increase to exposure to patients, which would have contributed to them developing the skill of empathy. The second most frequent response (n=18, 21.4%), pertaining to why empathy levels are expected to increase, was that a holistic understanding of a person is likely to have developed over the years, which would increase their level of empathy.

Table IV (above) indicates the percentages of respondents for each of the three most common reasons provided for the increase or decrease in empathy levels during the COVID-19 pandemic. These percentages per reason are categorised according to the respective year groups.

The majority of students (n=74, 66.1%) felt that the COVID-19 pandemic had impacted their empathy levels. Students from each of the four year groups were adequately represented in this response (1st-year = 21.6%, 2nd-year = 18.9%, 3rd-year = 29.7%, 4th-year = 29.7%). The remaining 38 students believed that the COVID-19 pandemic did not have an impact on students' empathy levels. The specific impact that students believed the COVID-19 pandemic had on their empathy levels is represented in Figure 3 (above).

DISCUSSION

This study had a good response rate (70.44%) in comparison to the only other available study[19] that measured levels of

empathy in undergraduate occupational therapy students. In this mentioned study by Brown *et al*,[92] out of a total of 169 occupational therapy students participated in the study (54.4% response rate)[19].

The results demonstrated that undergraduate occupational therapy students enrolled at the UFS had an acceptable level of empathy, as measured by the IRI. The scores reported in this study were higher than those reported in the original IRI validation study, involving the University of Texas undergraduate students[6]. Davis[6] reported a mean FS score of 4.47, PT score of 3.49, EC score of 3.91 and PD score of 2.55.

Referring to the results indicated in Table II (page 37), in terms of the mean scores for each of the subscales of the IRI, the fourth-year students obtained the highest score for each of the subscales, except for the FS. The first-year students obtained the highest score for the FS. When considering the average empathy levels per year group, it ranked as follows from the highest to the lowest level: fourth-, first-, third- and lastly, second-year.

The chi-square test proved no statistically significant difference between students' empathy levels and the four variables that could potentially influence one's empathy level, as indicated in Table III (page 37). Thus, according to the results, there was no significant association between students' empathy levels and repeating a year of occupational therapy training, treating clients, the commencement of occupational therapy training or an association with the COVID-19 pandemic.

The fact that 82.1% of respondents reported having worked with a patient or client as part of their occupational therapy training was a noteworthy finding. The result could either be attributed to a misinterpretation of the question, or students experienced their clinical fieldwork exposure differently. For instance, some of the first-year students might have felt that they had worked with a patient after their community service learning, which entailed a visit to a rural town, Trompsburg, located in the Free State Province. On the contrary, other students in the first-year group might not have experienced this aspect of their training as having worked with a patient or client due to the nature of the visit.

It has been suggested that once students progress from their first year of academic education and subsequently acquire hands-on experience through the completion of clinical fieldwork placements, their views of their chosen fields transition from an "idealised perception" to a more "realistic perception"[45,46]. Moreover, exposure to the realities of working with clients and patients, which might sometimes be quite challenging, may result in students developing a "professional or clinical distance" as a coping mechanism to deal with stressors[19]. Hence, with more advanced academic education and clinical fieldwork experience, healthcare students' empathy levels may decrease[47].

The literature discussed might support the findings of the lower levels of empathy among the second- and third-year students. As a result of the COVID-19 pandemic in 2020, both of these year groups unavoidably lost valuable clinical fieldwork experience and patient contact, despite already being limited in the first years of training. With the commencement of 2021 and the return of students to campus, these year groups were possibly overwhelmed when confronted by the evident gap in their experience and knowledge, when they were expected to perform assessments and treatments on real or simulated patients, with limited prior experience in clinical fieldwork. Thus, the COVID-19 pandemic could be suggested as a factor that influenced students' empathy levels within this specific period and context.

Additionally, when asked to indicate the impact of the COVID-19 pandemic on their empathy levels, it was also the third-year students with the highest indication that it had resulted in a decline of their empathy levels (n=9). Moreover, two third-year students (5.3%) indicated that at the time of participating in the study, they had not yet worked with clients as part of their occupational therapy training, which raised some concerns (n=38). This could be attributed to a poor understanding of the question or it could be a reflection of their lack of clinical exposure, possibly due to the COVID-19 pandemic.

The two most frequent reasons given by the students pertaining to why they decided to study occupational therapy are that (i) they have a passion for helping people, love for people or serving people (n=63, 56.3%) and (ii) being able to make a difference in someone's life or bringing about change (n=16, 14.3%). Empathy is an element that inclines people to pursue helping professions and contributes to comprehending others' experiences. However, self-empathy is a much-forsaken domain. It is essential, nevertheless, to guarantee that healthcare practitioners have sufficient resources to continue being empathic toward others[17]. When one is emotionally exploited, overloaded, overwhelmed or burnt out, the capability for an empathic approach towards others decreases[17].

Recommendations and future research

When discussing the results of the IRI, it is important to note that it is a self-report questionnaire. Therefore, one needs to be mindful when interpreting these results that they are the participant's responses and not undoubtedly predictions of their behaviour when practising as occupational therapists. The findings from this study will possibly allow the positive qualities identified (e.g., that most students believe that empathy is important in pursuing a career such as occupational therapy and that empathy is a specific skill) to be promoted in the curriculum. Regarding the negative findings (e.g., perceptions of empathy decreasing or changing since they have started studying or due to COVID-19), it is suggested that the Department of Occupational Therapy at the UFS develops alternative education and training processes to address the challenges that have surfaced. Additionally, it would be important for the Department of Occupational Therapy at the UFS to take special note of the findings, as these could possibly suggest that second- and third-year students feel inept to work with patients, which might have resulted in lower empathy levels in comparison to the other groups. As previously mentioned, research indicated that substantial workloads and expectations to be successful in treating clients are proven elements that often negatively influence empathy levels[19]. Furthermore, the

importance of cultivating an awareness of the concept and significance of practising self-empathy should be conveyed in student training.

Current evidence confirms that training can enhance healthcare practitioners' empathy and compassion[48]. Medical education research regarding skills and behaviours that promote empathy and provide a framework from which researchers and educators can develop evidence-based curricula is available in recent literature[48].

This study possibly forms the foundation for further research investigating undergraduate occupational therapy students by undertaking a longitudinal study of students' empathy levels from the first year of enrolment to graduating as a qualified therapist. Additionally, future research would benefit from a larger scale exploration through collaboration across several occupational therapy programs on a national and possibly an international level.

Limitations of the study

Potential limitations of the study include that the IRI is a self-report scale and it is possible that participants might have been biased in their responses. A further limitation is that all participants were from only one South African university baccalaureate occupational therapy course. Therefore, the relatively small population size potentially might have impacted the findings, as the generalisability of the results is limited to groups of participants with similar characteristics. Furthermore, the context within which this study was conducted – in the midst of a global pandemic – potentially impacted students' responses, and subsequently the results, and should, therefore, be recognised as a possible limitation. Lastly, a methodological limitation was the manner in which some of the questions in the self-developed questionnaire were phrased. It is suggested that for future studies, all questions are phrased in a straightforward manner that is not open to inaccurate interpretation.

CONCLUSION

The findings from this study suggest that occupational therapy students at the UFS have a good and acceptable level of empathy, although the second- and third-year students demonstrated slightly lower levels of empathy. However, factors such as the COVID-19 pandemic, lack of clinical fieldwork experience, repeating a year of training and the commencement of occupational therapy training were identified as factors that influenced students' empathy levels. Therefore, if educators were to promote empathy among students as a beneficial professional characteristic, the primary areas to focus on would be the teachability of empathy as a skill, the benefits of empathy in healthcare and the concept of self-empathy. Further investigation into the trends of empathy levels in occupational therapy students across the four years of training (particularly in a South African context) is recommended.

Doris Pierce believes that occupational therapists and occupational therapy students "… are special people: creative, caring, intelligent, empathetic, playful and humanistic."[40:308]. From the literature and the findings of this study, it is strongly recommended that more attention should be given to empathy, as it plays an integral role not only in practice with clients, but also in the curriculum and training of occupational therapy students.

Acknowledgements

The authors acknowledge all the undergraduate students in the Department of Occupational Therapy, School for Health and Rehabilitation Sciences, for their participation in the study, as well as Dr Daleen Struwig, medical writer/editor, Faculty of Health Sciences, University of the Free State, for technical and editorial preparation of the article.

Conflict of interest

The authors do not have any conflict of interest to declare.

Author contributions

The research study was conceptualised during collaborative actions between all undergraduate researchers, as well as the study leader, as part of the undergraduate research module. A. Jansen, the study leader, supervised the study, provided feedback throughout the entire process, evaluated the different components of the study (i.e. literature review, protocol, research article etc.), assisted the undergraduate researchers with the interpretation of the data, as well as reviewed and edited the researched article. L. de Klerk, M. Kramer, B. Pieterse, K.A. Smith and A. van Tiddens, the undergraduate researchers, each contributed to writing the literature review, the study protocol, executing the data collection procedures, as well as writing up the results, presenting the research project during the annual research presentation day and writing the initial drafts of the research article. O. Aluko, the biostatistician, performed the statistical analysis of the data and provided the descriptive statistics that informed the results of the study.

REFERENCES

1. Brown B. Brené Brown's Powerful Quotes on Accepting Yourself Whole-Heartedly. Available at: https:/themindsjournal.com/brene-browns-powerful-quotes-on-accepting-yourself (accessed 17 February 2022)
2. Patterson J. Empathy: a concept analysis. International Journal for Human Caring. 2018;22(4):217–223. http:/dx.doi.org/10.20467/1091-5710.22.4.217
3. Jeffrey D. Empathy, sympathy and compassion in healthcare: Is there a problem? Is there a difference? Does it matter? Journal of the Royal Society of Medicine. 2016;109(12):446–452. http:/dx.doi.org/10.1177/0141076816680120
4. Davis MH. Measuring individual differences in empathy: evidence for a multidimensional approach. Journal of Personality and Social Psychology. 1983;44(1):113–126. http:/dx.doi.org/10.1037/0022-3514.44.1.113
5. Keaton SA. Interpersonal Reactivity Index (IRI). In: The Sourcebook of Listening Research. Hoboken, NJ, USA: John Wiley & Sons, Inc.; 2017, p. 340–347.
6. Davis MH. A multidimensional approach to individual differences in empathy. Catalogue of Selected Documents in Psychology. 1980;10(85):1–19. Available from: https:/citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.462.7754 (accessed 17 February 2022).

7. Batchelder L, Brosnan M, Ashwin C. The development and validation of the Empathy Components Questionnaire (ECQ). PLoS One. 2017;12(1):e0169185. https:/dx.doi.org/10.1371/journal.pone.0169185
8. Bošnjaković J, Radionov T. Empathy: concepts, theories and neuroscientific basis. Journal of Psychiatric Research and Addictions. 2018;54(2):123–150. https:/dx.doi.org/10.20471/dec.2018.54.02.04
9. American Occupational Therapy Association. Occupational Therapy Practice Framework: Domain and Process – Fourth Edition. American Journal of Occupational Therapy. 2020;74(Suppl 2):1–87. https:/dx.doi.org/10.5014/ajot.2020.74S2001
10. Merriam-Webster Dictionary. Springfield, MA: Merriam-Webster, Incorporated; 2020. Available from: https:/www.merriam-webster.com/dictionary/client; (accessed 18 February 2022).
11. Adams R. Clinical empathy: a discussion on its benefits for practitioners, students of medicine and patients. Journal of Herbal Medicine. 2012;2(2):52–57. https:/dx.doi.org/10.1016/j.hermed.2012.04.004
12. Del Canale S, Louis DZ, Maio V, Wang X, Rossi G, Hojat M, et al. The relationship between physician empathy and disease complications. Academic Medicine. 2012;87(9):1243–1249. https:/dx.doi.org/10.1097/acm.0b013e3182628fbf
13. Derksen F, Olde Hartman TC, van Dijk A, Plouvier A, Bensing J, Lagro-Janssen A. Consequences of the presence and absence of empathy during consultations in primary care: a focus group study with patients. Patient Education and Counseling. 2017;100(5):987–993. https:/dx.doi.org/10.1016/j.pec.2016.12.003
14. Derksen F, Bensing J, Lagro-Janssen A. Effectiveness of empathy in general practice: a systematic review. British Journal of General Practice. 2013;63(606):e76–84. http:/dx.doi.org/10.3399/bjgp13X660814
15. Quince T, Thiemann P, Benson J, Hyde S. Undergraduate medical students' empathy: current perspectives. Advances in Medical Education and Practice. 2016;7:443–455. http:/dx.doi.org/10.2147/AMEP.S76800
16. World Health Organization (WHO). WHO Education Guidelines 2013: Transforming and scaling up health professionals' education and training. Geneva: WHO; 2013. Available from: https:/www.hrhresourcecenter.org/node/5581.html (accessed 18 February 2022).
17. Riess H. The science of empathy. Journal of Patient Experience. 2017;4(2):74–77. http:/dx.doi.org/10.1177/2374373517699267
18. Fields SK, Mahan P, Tillman P, Harris J, Maxwell K, Hojat M. Measuring empathy in healthcare profession students using the Jefferson Scale of Physician Empathy: health provider – student version. Journal of Interprofessional Care. 2011;25(4):287–293. https:/dx.doi.org/10.3109/13561820.2011.566648
19. Brown T, Williams B, Boyle M, Molloy A, McKenna L, Molloy L, et al. Levels of empathy in undergraduate occupational therapy students. Occupational Therapy International. 2010;17(3):135–141. https:/dx.doi.org/10.1002/oti.297
20. Colliver JA, Conlee MJ, Verhulst SJ, Dorsey JK. Reports of the decline of empathy during medical education are greatly exaggerated: a reexamination of the research. Academic Medicine. 2010;85(4):588–93. https:/dx.doi.org/10.1097/acm.0b013e3181d281dc
21. Costa P, Magalhães E, Costa MJ. A latent growth model suggests that empathy of medical students does not decline over time. Advances in Health Sciences Education. 2013;18(3):509–522. https:/dx.doi.org/10.1007/s10459-012-9390-z
22. Roff S. Reconsidering the "decline" of medical student empathy as reported in studies using the Jefferson Scale of Physician Empathy-Student version (JSPE-S). Medical Teacher. 2015;37(8):783–786. http:/dx.doi.org/10.3109/0142159X.2015.1009022
23. Hegazi I, Hennessy A, Wilson I. Empathy levels in medical students: do they really change over time? In: Kondo M (ed.). Empathy – An Evidence-Based Interdisciplinary Perspective. Rijeka, Croatia: InTech; 2017. p. 147–170. Available from: https:/doi.org/10.5772/intechopen.69625 (accessed 18 February 2022).
24. Yu ML, Brown T, Hewitt A, Cousland R, Licciardi L, Lyons C. Baccalaureate occupational therapy students' development of social and emotional competencies. Nurse Education Today. 2021;105:105032. https:/dx.doi.org/10.1016/j.nedt.2021.105032
25. Keefe T. Empathy: the critical skill. Social Work. 1976;21(1):10–14. Available from: https:/citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.949.7766&rep=rep1&type=pdf (accessed 18 February 2022).
26. Rogers CR. The necessary and sufficient conditions of therapeutic personality change. Journal of Consulting Psychology. 1957;21(2):95–103. http:/dx.doi.org/10.1037/h0045357
27. Hojat M, Gonnella JS. Eleven years of data on the Jefferson Scale of Empathy – Medical Student Version (JSE-S): proxy norm data and tentative cutoff scores. Medical Principles and Practice. 2015;24(4):344–350. https:/dx.doi.org/10.1159/000381954
28. Lawrence EJ, Shaw P, Baker D, Baron-Cohen S, David AS. Measuring empathy: reliability and validity of the empathy quotient. Psychological Medicine. 2004;34(5):911–920. https:/dx.doi.org/10.1017/s0033291703001624
29. Baron-Cohen S, Wheelwright S. The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. Journal of Autism and Developmental Disorders. 2004;34(2):163–175. https:/dx.doi.org/10.1023/b:jadd.0000022607.19833.00
30. Neumann DL, Chan RCK, Boyle GJ, Wang Y, Rae Westbury H. Measures of empathy: self-report, behavioral, and neuroscientific approaches. In: Boyle GJ, Saklofske DH, Matthews G (eds.). Measures of Personality and Social Psychological Constructs. Amsterdam: Elsevier; 2015, 257–289.
31. Pierce DE. The sociocultural dimension of occupation. In: Pierce DE (ed.). Occupation by Design: Building Therapeutic Power. Philadelphia, PA: F.A. Davis Company; 2003, 197–218.
32. Taylor RR, Van Puymbroeck L. Therapeutic use of self: applying the intentional relationship model in group therapy. In: O'Brien JC, Solomon JW (eds.). Occupational Analysis and

Group Process. St. Louis, MO: Elsevier; 2013, 36–52.
33. Health Professions Council of South African (HPCSA). Conduct and ethics. Ethical guidelines for good practice in health care professions. Available from: https:/www.hpcsa.co.za/?contentId=79 (accessed 18 February 2022).
34. Del Canale S, Louis DZ, Maio V, Wang X, Rossi G, Hojat M, et al. The relationship between physician empathy and disease complications: an empirical study of primary care physicians and their diabetic patients in Parma, Italy. Academic Medicine. 2012;87(9):1243–1249. https:/dx.doi.org/10.1097/acm.0b013e3182628fbf
35. Rauhaus BM, Sibila D, Johnson AF. Addressing the increase of domestic violence and abuse during the COVID-19 pandemic: a need for empathy, care, and social equity in collaborative planning and responses. American Review of Public Administration. 2020;50(6-7):668–74. http:/dx.doi.org/10.1177/0275074020942079
36. Pfattheicher S, Nockur L, Böhm R, Sassenrath C, Petersen MB. The emotional path to action: empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic. Psychological Science. 2020;31(11):1363–1373. http:/dx.doi.org/10.1177/0956797620964422
37. Riess H. The impact of clinical empathy on patients and clinicians: understanding empathy's side effects. American Journal of Bioethics Neuroscience. 2015;6(3):51–53. http:/dx.doi.org/10.1080/21507740.2015.1052591
38. Williams B, Brown T, McKenna L, Beovich B, Etherington J. Attachment and empathy in Australian undergraduate paramedic, nursing and occupational therapy students: a cross-sectional study. Collegian. 2017;24(6):603–509. https:/dx.doi.org/10.1016/j.colegn.2016.11.004
39. Rakel D, Barrett B, Zhang Z, Hoeft T, Chewning B, Marchand L, et al. Perception of empathy in the therapeutic encounter: effects on the common cold. Patient Education and Counseling. 2011;85(3):390–307. http:/dx.doi.org/10.1016/j.pec.2011.01.009
40. Pierce DE. You are what you do. In: Pierce DE (ed.). Occupation by Design: Building Therapeutic Power. Philadelphia, PA: F.A. Davis Company; 2003, 301–309.
41. Komeda H, Kosaka H, Fujioka T, Jung M, Okazawa H. Do individuals with autism spectrum disorders help other people with autism spectrum disorders? An investigation of empathy and helping motivation in adults with autism spectrum disorder. Frontiers in Psychiatry. 2019;10:376. http:/dx.doi.org/10.3389/fpsyt.2019.00376
42. Hojat M, Spandorfer J, Louis DZ, Gonnella JS. Empathic and sympathetic orientations toward patient care: conceptualization, measurement, and psychometrics. Academic Medicine. 2011;86(8):989–995. https:/dx.doi.org/10.1097/acm.0b013e31822203d8
43. Spreng RN, McKinnon MC, Mar RA, Levine B. The Toronto Empathy Questionnaire: scale development and initial validation of a factor-analytic solution to multiple empathy measures. Journal of Personality Assessment. 2009;91(1):62–71. http:/dx.doi.org/10.1080/00223890802484381
44. Konrath S. Critical Synthesis Package: Interpersonal Reactivity Index (IRI). MedEdPORTAL Publ [Internet]. 2013;1–7. https:/doi.org/10.15766/mep_2374-8265.9596
45. Greene D. Student perceptions of aging and disability as influenced by service learning. Physical and Occupational Therapy in Geriatrics. 1998;15(3):39–55. http:/dx.doi.org/10.1080/J148v15n03_03
46. Henry-Tillman R, Deloney LA, Savidge M, Graham CJ, Klimberg VS. The medical student as patient navigator as an approach to teaching empathy. American Journal of Surgery. 2002;183(6):659–662. https:/dx.doi.org/10.1016/s0002-9610(02)00867-x
47. Reynolds WJ, Scott B. Do nurses and other professional helpers normally display much empathy? Journal of Advanced Nursing. 2000;31(1):226–234. http:/dx.doi.org/10.1046/j.1365-2648.2000.01242.x
48. Patel S, Pelletier-Bui A, Smith S, Roberts MB, Kilgannon H, Trzeciak S, et al. Curricula for empathy and compassion training in medical education: a systematic review. PLoS One. 2019;14(8):e0221412. http:/dx.doi.org/10.1371/journal.pone.0221412

Decolonial turn of collective occupations in post-apartheid South Africa: Young people's voices of occupational legacy

AUTHORS

Thuli Godfrey Mthembu[a]
https://orccid.org/0000-0002-1140-7725
Whelan Gwendean Julius[a,b]
https://orcid.org/0000-0003-2107-5258
Kristen Havenga[a,c]
https://orcid.org/0000-0003-3517-4345
Irvin Thabang Mwadira[a,d]
https://orcid.org/0000-0003-3945-5590
Kayla Oliver[a,e]
https://orcid.org/0000-0002-1612-0758
Megan Alexander[a]
https://orcid.org/0000-0003-1174-7970

AFFILIATIONS

[a] Department of Occupational Therapy, Faculty of Community and Health Sciences, University of the Western Cape, Bellville, South Africa
[b] Western Cape Department of Health, Helderberg Hospital, Somerset West, South Africa
[c] Nanny N Me, Growing Together, Cape Town, South Africa
[d] Gauteng Department of Health, Sebokeng Regional Hospital, Vanderbijlpark, South Africa
[e] Akeso Stepping Stones Addiction Treatment Centre, Cape Town, South Africa

CORRESPONDING AUTHOR

Thuli Mthembu
tmthembu@uwc.ac.za

KEYWORDS

occupational potential, intergenerational, young people, occupational choices, social change and transformation, occupational decision-making activities

HOW TO CITE THIS ARTICLE

Mthembu TG, Julius WG, Havenga K, Mwandira IT, Oliver K, Alexander M. Decolonial turn of collective occupations in post-apartheid South Africa: Young peoples' voices of occupational legacy. South African Journal of Occupational Therapy. Vol. 53 No. 2, August 2023
DOI: https://doi.org/10.17159/2310-3833/2023/vol53n2a5

ARTICLE HISTORY

Submitted: February 2021
Reviewed (Round 1): April 2022
Reviewed (Round 2): August 2022
Revised: January 2023
Accepted: January 2023
Published: August 2023

EDITOR

Blanche Pretorius
https://orcid.org/0000-0002-3543-0743

DATA AVAILABILITY

Upon reasonable request, from corresponding author.

FUNDING

There is no funding to be declared for this research.

ISSN On-line 2310-38

ABSTRACT

Background: Collective occupations are a vital part of the post-apartheid South African context because they enable parents and grandparents to pass on their legacies to the young people in families and communities. However, there are social inter-generational problems such as corruption, unemployment, family conflicts and poverty that disrupt the actions of inculcating occupational legacy.
Aim: This study explored young people's voices of occupational legacy in a post-apartheid South African context.
Method: A socio-narratology qualitative inquiry was employed to gain insight from eight participants who were recruited using purposive sampling. Semi-structured interviews were conducted to collect data, which were analysed thematically in a credible process.
Results: Five themes that amalgamated collective occupations with occupational legacy were identified: decoloniality of 'knowledge generation and transfer', decoloniality of 'doing', decoloniality of 'being', decoloniality of 'becoming' and decoloniality of 'belonging'.
Conclusion: The findings add to our understanding of the power of occupational legacy in ameliorating the problematic situations that enabled the young people's continuity, social change and transformation through collective occupations. It is evident in the findings that the young people exerted maximal efforts to engage in occupational decision-making activities that were guided by the available opportunities so they may transition to the different contexts.

IMPLICATIONS FOR PRACTICE

Continued efforts for promoting coping mechanisms are needed in occupational therapy services provided in communities to develop targeted intervention aimed at fostering resilience among young people to adapt from the stressful situations and adverse.

Ensuring appropriate wellness systems and intergenerational support for youth development should be a priority for occupational therapists to promote mental health and strengthen relationships and interdependence through collective actions to decrease anxiety, depression and stress.

INTRODUCTION

Collective occupations play a significant role in the post-apartheid South African context where parents and grandparents are expected to pass on their family legacies to the younger generations. In the post-apartheid era, socio-intergenerational problems such as corruption, unemployment, hunger, family conflicts and poverty tend to influence families who need to inculcate in young people the importance of legacies in townships, rural

and urban areas[1,2]. It is evident that parents, grandparents and young people are still experiencing the wounds of South African Apartheid and colonial history. Persistence of health, racial, political and economic inequalities perpetuates a legacy of family disruption[3]. This indicates that parents and grandparents pass on the legacy of family disruption and poverty to the young generations as a part of intergenerational transmission. However, little is known about young people's voices regarding their family and occupational legacies.

In the post-apartheid South African context, occupational therapists need to have a better understanding of the performance patterns that are transmitted from one generation to another through engagement in collective occupations between parents, grandparents and young people to impart family legacies[4-6]. These family legacies comprised health related, role related, personal qualities, legacy of blame, and an emotional legacy and intergenerational activities[6,7]. Yet, there is a lack of literature focusing on a strategy of occupational legacy from a family and an occupational therapy perspective, where occupations are passed on to the younger generations. The rarity of insight into occupational legacy influences how young people apply their occupational potentials to make occupational choices that invigorate occupational decision-making. Therefore, acknowledging occupational legacy as an occupational therapy strategy contributes to the richness of the profession in enabling occupational therapists to gain insight into the performance patterns such as habits, routines, roles, rituals, and practices[8].

Intergenerational transmission of cultural resources to generations through the education system raised more critiques of the habitus because it does not focus on the family context[9]. Bourdieu's work resonates with the new strategy of occupational legacy that promotes not only knowing but doing or not doing[9]. This strategy contributes to occupational science and by exploring the young people's voices of occupational legacy as part of collective occupation in a South African context could guide professional practice. For the purpose of this paper, occupational legacy refers to passing and doing valued occupations that are socially, culturally and historically defined within a set of traditional beliefs, practices, values, attitude, knowledge and skills from one generation to another generation through connections and social participation. However, occupational legacy is a double-edge strategy that has positive and dark sides that might influence young people's human occupation and lives. An example of positive consequences of occupational legacy is evident within the Biko's family, as their mother passed on the caring ethic to her children, which is grounded on interpersonal relationships and morals[10]. Biko's mother's acts influenced each of her children to choose the caring professions later in their lives and uplifted others through socialisation irrespective of racial backgrounds, which resonated with the morality of duties that support the strategy of occupational legacy[10,11]. Conversely, there are dark sides of occupational legacy that involve continuity of engagement in unhealthy occupations that perpetuate substance abuse, economic instability, domestic violence, criminal activities, imprisonment and vulnerabilities in families[12]. Consequently, it is important that young people should learn to refine, reject, or modify their occupational legacies[13], which could be done by adopting the critical border thinking that facilitates decolonial turn efforts.

Embracing teleological suspension disciplinarity, the co-authors have shown willingness to go beyond the discipline of occupational therapy to produce knowledge from different voices of young people[14]. This strengthens the epistemic decolonial disobedience that enables decolonial turn when shifting through the geography of reason[14-17]. Decolonial turn refers to a "family of diverse positions that share a view of coloniality as a fundamental problem in the contemporary world"[17:2]. This indicates that young people should advocate for their existence by engaging in critical reflections that challenge the legacies of the South African Apartheid and colonised history that result in coloniality of power, being and knowledge during the period of post-apartheid[18]. Therefore, decolonial turn plays a crucial role in assisting the young people to reflect on how colonial memory and footprints influenced their family and occupational legacies that were passed on to them[18]. It is evident that decolonial turn might open the doors to the healing process where the young people could learn tacit knowledge, patterns, processes, practices, and survival skills through a strategy of occupational legacy[5,19]. Additionally, decolonial turn is supported by the morality of duty that accentuates other-regarding morality that promotes relational duties such as "values of compassion, solidarity, reciprocity, cooperation, interdependence, and social well-being"[11:17]. Moreover, the morality of duties involves the importance of relationships with others to promote the well-being of all, which supports personhood that is achieved through reaching out to others and helping them[11]. Decolonial turn and morality of duties are perceived as enablers of collective occupations that facilitate occupational legacy, however, there is little research that has focused on the young people's voices of occupational legacy that has been passed on to families. Thus, this paper responds to the question: What are young people's voices of occupational legacy within a post-apartheid South African context?

Democracy was implemented to dismantle the legacies of apartheid; however, it is noted that in the post-apartheid era the colonised families are still entrenched in the colonial practices and patterns of power that result in a family disruption and inequalities, which is perceived as coloniality of families[20]. In the post-apartheid era, families and young people are still experiencing occupational injustices, inequalities, and breathing under colonial conditions[21]. This resonates with Frantz Fanon's theory of the zone of non-being in Black Skin, White Mask, which accentuates that people continue to live in "an extraordinarily sterile and arid region"[22:10] where indigenous cultures of the colonised families have been subverted by the "political, capital and educational dominance"[23:487]. The subverting actions of the coloniser persist in environments filled with social and economic inequality, dehumanisation, racism, and a capitalist agenda emanating from colonisation[24,25]. Dehumanising actions of the coloniser have not only

influenced the colonised families' health, quality of life and well-being, but also the young people living in adverse and challenging environments affected by corruption, unemployment and poverty[1,2,26]. The young people living in the zone of non-being are exposed to precarious activities, despair, idleness, and negativity, which perpetuate not being in education, employment, or training (NEET) and their personhood and dignity are questioned[27,28]. Consequently, decolonial thinkers argued that institutions such as families, communities, churches, schools and government persist with the coloniality of dehumanising the imagination and minds of indigenous people[29,30]. This indicates that decolonial efforts should address the intergenerational transmission of poverty that perpetuated the legacy of coloniality young people.

Young people need to achieve open, non-oppressive identities through their connections with others, which further echoes Dr Cornel West's introductory words in Black prophetic fire "I am who I am, somebody loved me, cared for me and attended to me"[26,31,32]. Therefore, family is an institution that promotes decolonial love through connectedness to others to liberate the young generation from the horrible legacy of colonial violence[33]. Yet, it is inexplicit how the decolonial love, connectedness to others and morality of duties were transmitted to the younger generation to address the complexity of colonial differences that persisted to influence their understanding of the humanity and intersubjective relations in terms of power and hierarchies resulting to oppression and inferiority[34-36]. Acknowledging the young people's voices will emancipate them to reflect on the process of rehumanisation of the world at individual, family and society level, which accentuates the importance of interdependence[35].

Young people depend on their parents and grandparents to transmit occupations related to socialisation, child upbringing, transfer of cultural activities and knowledge as well as practical skills needed for their survival in society and future[37]. The transmission of practical skills and knowledge contributes to the strategy of occupational legacy that enables families to impart occupations to the young generations. Irrespective that the transmission is pertinent in colonised families, the South African Apartheid and colonial history of race, class, gender, ethnicity and geography persist to influence the young people's self-esteem whilst pushing them to the zone of nonbeing[26]. This necessitates a decolonial epistemic perspective of human occupation so that the young people and their families may develop the capacities to attain a personal and group sense of belongingness[15,37-40].

Decolonial epistemic perspectives

Decoloniality is an epistemological movement that promotes the liberation, thinking, knowing and doing of colonised communities and families who were affected by the global coloniality systems like apartheid[23]. The epistemological movement facilitates critical border thinking by focusing on the religious, political, economic, linguistic, epistemic, and cultural influences[15,23]. In decolonising human occupation, there is a need of a decolonial turn approach to dismantle the coloniality of knowledge, being and power in the era of post- apartheid[18,15,41]. Coloniality of knowledge asserted that the young people are the victims of the South African Apartheid and colonial structures of knowledge, as objects of deceit, oppression and exploitation[16]. Therefore, a decolonial turn approach is needed to consider the multiple contributions of young people's voices from racialised and colonised families to the production of their knowledge and critical thinking, which is resonant with pluriversality that raises awareness of repressive forces of coloniality[20,41]. Hence, the process of co-construction is important in the occupation-based community development (ObCD), as the production of knowledge emanates from the multiple of realities in a context[42]. This addresses coloniality of knowledge by viewing young people as part of assets-based community development (ABCD) whereby relationships are built with the intentions to recognise individuals with gifts and skills[21].

Contrary to this, the coloniality of being has been masked by the traumatic effects that emanated from the Manichean misanthropic scepticism, which were constructed to question personhood and dignity of colonised families and young people[20]. Coloniality of being as a condition influenced young people born from colonial and racial families who are marked as dispensable[20,41]. This further supports Fanon's explanation of *le damné de la terre* (The Wretched of the Earth) that the colonised families and young people in underdeveloped countries are still struggling because of scarcity of resources, unemployment, death rate, inferiority complex and hopelessness about their future[20]. Hence, the coloniality of being has been associated with the zone of non-being because of the persistence of invisibility and dehumanisation, intergenerational poverty, exploitation, displacement, dispossession, brutalities and violence which violated the meaning of humanity alterity[20,41]. Brutalities related to the coloniality of being influenced young people's aspirations to realise that they have potential to flourish and shape their future[41]. This appears as a problematic situation that guides people's collective and socially transformative actions to remake their lives and worlds, which resonates with the theory of occupational reconstruction[43,44]. Thus, the epistemic perspective of decoloniality[45] assists in rescuing subjectivity, creating strategies to interrupt the cycle of social inequalities and violence, resilience, and protagonist influencing young people's lives.

METHODS

Study design and ethical considerations

A socio-narratology qualitative inquiry as a non-invasive method was used to explore young people's voices of occupational legacy in the post-apartheid South African context. The socio-narratology was employed because it provides different subjectivities that underpin understanding of and experiencing the world through companionships of stories[46]. The socio-narratology invigorates symbiotic dependency whereby the young people share stories about their living in the past, present and future[47]. The collaborative nature of the narrative inquiry engendered an opportunity for the young people's stories to reconstruct and construct

Table I: Participants' demographic information

Participants*	Age	Gender	Race	Home Language	Grade	Socio-economic	Family Structure
Shaun	17	Male	Coloured	Afrikaans	10	Middle	Biological parents divorced Residing with mother
Cecilia	16	Female	Coloured	Afrikaans	9	Low-Middle	Father is absent from home environment (Mon.-Fri) due to work responsibilities
Lauren	17	Female	White	English	11	Low-Middle	Biological parents divorced Living with biological father
Michael	17	Male	White	English	11	Middle	Parents married Only child
Octavia	16	Female	Coloured	Afrikaans	10	Middle	Biological parents absent Living with grandmother
Nehemia	18	Male	Coloured	English	11	Low-Middle	Living with parents at grandparents'
Thando	18	Male	Black	isiXhosa	10	Low-Middle	Living with parents & siblings
Aviwe	17	Female	Black	isiXhosa/Sotho	10	Low-Middle	Biological parents divorced. Living with biological father and 3 stepmothers

meaning about life while engaging with each other's help in building their lives and communities[47]. This animated the young people and collectivities through a dialogical interaction between the researchers and participants[46].

Ethical approval was obtained from the Biomedical Science Research Ethics Committee of the University of the Western Cape (Ethics Reference Number: BM18/5/17).

Sampling

Purposive sampling with maximum variation[48,49] was employed to recruit eight participants (n=8) from four different districts in the Western Cape; representing diverse races (i.e., Black, Whites, and People of Colour), cultures and socio-economic statuses. The participants between the ages of 13 and 19 years old from both genders (i.e., female and male) were recruited. Participants were informed that participation in the study is voluntary then they and consented to be audio recorded and they were free to withdraw at any time. Anonymity was enhanced through pseudonyms to protect the confidentiality and privacy of the participants during reporting and publishing, as mandated in section 19 of the POPI Act 2013[50].

Data collection and analysis

Semi-structured open-ended interviews were conducted with participants (n=8) who were afforded with a space within their time to share their stories and experiences related to socio-historical events, which lasted 25-40 minutes[51]. The semi-structured interviews were chosen so that the dialogical reflections about existence within the microsystem while focusing on participants' family life, traditional beliefs, values, dreams, hopes, interactions with others and their aspirations to participation in a range of occupations during the post-apartheid period. Data redundancy was reached during data collection and analysis when the authors noted that the new data repeated what was shared in the previous data. All semi-structured interviews were audio-recorded and transcribed verbatim.

Applying a dialogical narrative analysis[46] with thematic analysis[51,52,53] resulted in identification of the stories related to existing concepts, theories and conceptual structures of dimensions of human occupation. The transcripts were read several times which assisted in the familiarisation with the stories of the young people. This led to stage coding where stories were coded individually by the authors to gain understanding of the reflections. The codes were grouped into categories and consensus was reached after the discussion of the codes. The co-authors searched for the themes and had a collective discussion, which resulted in an agreement that supported the interpretations as well as defining and naming the themes. The themes were named and linked based on in-vivo quotes from the participants. Subsequently, the co-authors asked dialogical questions related to resource questions, affiliation questions and identify questions. This assisted in pulling the analysis together by using the dimensions of occupation comprising doing, being, becoming and belonging to contribute to human occupation[36,54].

FINDINGS

A total of eight participants engaged in the present study. The participants were between 16 and 18 years of age with mean and standard deviation of 17±0,755. There were four female- and four-male participants who consented to be part of the interviews. In relation to race, more than half of the participants (n=4, 50%) were coloured. The participants expressed themselves in their home language and they were all at different high school grades. Five of the participants shared that they live within a low-middle class. Participants' family structure involved grandparents, and parents; however, there were participants that stayed with mother or father because of the family disruptions such divorce, or an absent father.

* Pseudonyms

Five overarching themes were identified: i) decoloniality of 'knowledge generation and transfer' of occupational legacy, ii) decoloniality of 'doing' in collective occupation,

iii) decoloniality of 'being' in collective occupation, iv) decoloniality of 'becoming' in collective occupation, and v) decoloniality of 'belonging' in collective occupation.

Decoloniality of *'knowledge generation and transfer'* of occupational legacy

This theme is made of three stories that focus on the participants' understanding of occupation, legacy and occupational legacy. Participants' knowledge about the things that they do that form part of their occupations. This was explicit from the participants' voices, they perceived occupation as a job or career that sustains living through providing income for the family.

> "Occupation, to my own understanding I would say occupation is something that you do for a living… My occupation recently has been schooling and teen parenting" **(Aviwe)**

> "I would think it would be a career or a job that your family or that a certain person does to earn an income, work, that sort of thing." **(Michael)**

Languages played an important role in the participants' understanding of occupation. Both Shaun and Cecelia highlighted that occupation is perceived as "aktiwiteit reeks" in Afrikaans. As a result, the participants tried to deconstruct the word into "aktiwiteit" (activity) and "reeks" (range) to have a better understanding of occupation.

> "It is almost like a range of activities in terms of different sorts of activities… two or three times a week I will be at church, I will do youth, spiritual dancing and then I will be very involved with chess at school." **(Shaun)**

> "It is where you do a lot of activities, but in a specific range or something… at the moment what I do is, I am mostly in music, the music industry. Like I blow my instrument" **(Cecelia)**

It was clear in the participants' voices that occupation had an influence on their health. Shaun and Cecilia shared that occupational engagement in meaningful activities enhanced their mental wellbeing because they were able to cope with stressful moments and problems. Additionally, the participants had a sense of contentment because their occupations contributed to their spiritual health and they were able to connect with self and God.

> "For me, it is a type of stress reliever, so I do it for that… not for fun, but to get away from my problems." **(Shaun)**

> "It makes me feel very good because I don't do it for people. I do it for myself, to make myself feel good and to give praise to the Lord through the instrument I play." **(Cecilia)**

With the story of understanding legacy, few of the participants shared their insight into the concept of legacy. Aviwe shared that legacy *"it can be something that you give a piece of yourself".* This is reverberated in Lauren's example of legacy *"I would say legacy is what you leave behind… if you have a career in something that you started and you love. Basically, you passed that on to your family… like family business sort of thing. The family members as they get old enough they work into the family business and it carries on like that but I guess it could be something else but to me that's what it would mean."*

> Shaun said it is "the footsteps in which you need to follow… I thought that my grandpa liked fishing, my father liked fishing, so why can't I like it, because after my father no one like fishing"

> "Legacy that would be something that's passed down from one generation to another generation … that's influenced you either as a person or as a group …" **(Michael)**

> "Legacy? I would say it is something like inheritance. Maybe your parents or someone in the family passes away and they leave you money or some property for you to… Or maybe a business for you to carry on for the other generations." **(Aviwe)**

It was noted that economical inequalities perpetuated intergenerational poverty because some of the participants were living below the poverty line. For instance, Nehemiah's story highlights that poverty was passed on within the family.

> "Basically, from where our family started, how my parents got together before they were married. Even then they struggled, and us as well, getting me my brothers and sisters because they struggled" **(Nehemiah)**

Decoloniality of *'doing'* in collective occupations

This theme accentuates the participants' endeavours to engage in a variety of collective occupations which are transmitted by their families, as part of occupational legacy. Participants shared that the strategy of occupational legacy exists in different families to guide social transformation and reproduction. Michael shared that occupational legacy is *"passing it down to future generations and leaving a legacy".* The participants acknowledged that there are positive and dark sides of occupational legacy guided their occupational choices and decision-making. Drawing from the voices of decision-makers (Thando and Cecilia), they highlighted that they were not willing to engage in unhealthy occupations such drinking alcohol and unacceptable behaviours such poor anger management that they felt form part of the dark side of occupational legacy.

> "She (Mother) used to drink a lot. So, my thought is that I shouldn't even go near alcohol nor should I abuse alcohol because it is going to make me lose my path. Most of the youth here smoke and do funny things … I am not judging them but that is my opinion and as a result I decide not to engage myself and separate myself from such." **(Thando)**

> "I will also live like them, but then there is also something about my grandfather that I don't want to follow...not to be like him, but definitely like my grandmother...my grandfather is someone that gets angry easily and I don't want to be like that ..." **(Cecilia)**

In Octavia's and Nehemiah's stories, the dark side of occupational legacy included dehumanising and interpersonal violence related to gender-based violence, which affected their family relationship and cohesion. Octavia said, *"They did drugs and my father always abused my mother and they always argued and now they are separated".*

> "Basically, arguments and stuff that my parents had gone through. Some type of abuse, verbal and physical, not just between my parents, but between all of us, and which created conflict and stuff, so that's basically what happened". **(Nehemiah)**

An occupation of sharing one's life story with others was identified in the stories of Thando and Nehemiah, which show the generative and continuity aspect of their families. The stories were used to share traditional beliefs, knowledge, values, wisdom, humour, encouragement and histories of families of the young people which also guide them to occupational choices. The sharing of stories resonates with the concept of altericity, which supports the sense of generosity of colonised families to give and receive freely in societies[20,59]. According to Nehemiah, *"So the stories that they've been telling is to teach you respect".* On the other hand, the stories promoted decolonial love and understanding through engagement in collective occupations such as family dinner, which enabled the positive part of occupational legacy that enhanced family cohesion, resilience and sense of hope.

> "On Sundays we have a family dinner...We sit together as a family and we just chat. Stories from my parents were around me not giving up and knowing that I'm not perfect and neither are they. In everything that I do, I must work hard and try my utmost best. I must learn from my own mistakes and their mistakes...Lastly, I shouldn't allow my family circumstance pull me down... my grandmother used to share with us tales because we didn't have story books, these tales were about life, wisdom, respecting elders, being a good child and the value of family". **(Thando)**

> "That it (legacy) is not just physical things, but it is also the lessons that you learn along the way ... the lessons could be your legacy, what you have learned and what you have gained and what you have drawn from the examples around you... Like maybe being a role model to them, like how the struggle I came through and I still made it at the end of the day, see, so basically that legacy of persevering through". **(Nehemiah)**

> Octavia's story revealed that through doing and sharing the wellbeing of others is enhanced to bring a sense of fulfilment and contentment. Therefore, occupational legacy has been passed on through knowing and doing occupations such as playing, cooking, cleaning and gardening: "I would say my grandma, because she has been there most of my life and teaching me how to do specific things. My mother...she liked playing netball. I am good at netball ... how to make a specific dessert or food or how the house should be cleaned bottom to top and keeping a neat garden". **(Octavia)**

Despite the fact that some stories highlighted positive occupational legacies, the stories of Aviwe and Lauren however, evidently show the zone of non-being. They were occupationally restricted because their occupational choices were influenced by the social environment and adult-child power relational forces. This perpetuated the poor communication between the participants and their parents, which resulted in a sense of silence.

> "I had that grudge so I didn't really click with lots of people. I didn't even socialise, I was just that girl who sat at the corner and put earphones, that's it...I've become matured from that and also how to take care of things and how to solve problems whenever there is one ...growing up with my grandmother who was very much strict, whenever you wanted someone to talk to, you couldn't open up to her. I didn't really let people in. I used to bottle up a lot and sometimes I still do." **(Aviwe)**

In Lauren's story, the coloniality of religion perpetuated the experiences of living in a zone of non-being because the parents restricted Lauren's occupational choices of socialising with friends.

> "It was definitely not being able to live like a normal life... but in the sense of not being able to experience what other people were experiencing or other kids my age because of the religion that my parents were in and how they raised me according to that religion...Grade 7, I would always be invited out and my parents would be like oh no we have to go to church tonight or like you can't because of that ..." **(Lauren)**

Decoloniality of *'being'* in collective occupations

This theme deals with the participants' occupational legacies that were imparted from their families to strengthen their personal identity and inner being that provided meaning, direction and coherence in their life. The efforts of decoloniality of 'being' that appeared to incorporate the things that the participants do as part of collective occupation to rejuvenate their existence, wellbeing and health. Five of the participants (Michael, Aviwe, Thando, Shaun and Cecilia) shared who they are in life using different types of voices of how they connect with God and express their spirituality. For instance, Michael used a religious voice, *"We are religious in the sense that we do certain things and celebrate like big days and that together."*

Three of the participants (Aviwe, Thando and Cecilia) in

voices of God-fearing and Christian mentioned that they engage in a variety of traditional religious and spiritual occupations such attending church, prayer and reading a bible, which were incorporated in their daily routines.

> "I'm God-fearing…every day before we go to sleep we pray" **(Aviwe)**

> "We are Christians, we don't do cultural things. When we're about to sleep we pray and in the morning as well, when we are about to go to school we pray again…. My mother was Christian but she did not attend church by then. Then when I started going to church a lot, my mother and brother decided to come with me to church. So I am the one who influenced my parents to go to church… I think I have to do it with my children because I need to do something that I never got from my parents." **(Thando)**

> "We were taught to read Bible" **(Cecilia)**

It was noted from the stories of Michael and Shaun that psychological material such as values and traditional celebration formed part of their social identity. For instance, Shaun with a voice of a committed and spiritual person shared that *"My grandfather always taught me a lot of values like loyalty, always be honest. And to be attached to an item is how you can actually remember what you have been taught… at least two or three times a week I will be at church, I do spiritual dancing".* The engagement in these occupations such as attending church, prayer, reading a bible and spiritual dance provided the participants with a sense of inner peace and renewal in times of stress and demands of their daily activities.

The story of Aviwe regarding sexuality highlighted that some families were deeply entangled within the coloniality of parental power and patriarchal structures that perpetuated coloniality of being, gender oppression and social inequality. However, it should be noted that Aviwe's efforts emancipated a decolonial attitude towards self-discovery, self-love and understanding, which provided possibilities of intersectionality to reinforce the inner voice and agentic role. Aviwe said, *"I would say from my father I learnt self-love, because at times when I was young I was a tomboy and my father and I didn't get along because of that… from my father I've learnt to stand up for myself. Like if maybe at school you're being bullied you have to stand up for yourself and listen to the inner voice in you because you can never go wrong with it".* Aviwe's self-reflexivity resulted in a sense of inner peace and internal capacities that supported good health and quality of life.

Decoloniality of *'becoming'* in collective occupations

This theme deals with the conscious efforts that emanated from the generative parents who guided their children's occupational choices, emancipation and transformation, which indicated that 'becoming' contributes in relational and occupational decision-making. Shaun shared that generative parents have a role to play in personal decision making because *"they are also part of the choices that I make, I also consider them when I make decisions… my way of thinking is similar to my mother's, because it is actually values that will actually open doors for me in the future".* This echoed by Thando and Michael's voice of self-improvement reflected on the occupational need of coherence that connected present moment with the past and future to enable emancipation from the oppression of poverty resulted in a sense of continuity and gratitude.

> "My parents encourage me to focus on education and school. Although they never went to school and they are uneducated, they always encourage me to focus on my academics so that I can be able to give them a better quality of life and move them out of poverty. We live in an informal settlement and I want to make something out of my life so that I can remove them from that environment and find a better one." **(Thando)**

> "It wasn't just my choice, they (parents) helped me towards but I'm very thankful they did because if not I could still be wondering where I would go or do…I would obviously spend a lot of time with my children and family because I feel like that's the most important thing, your family is the closest people and you should always be spending time with them, getting good bonds between them" **(Michael)**

From Nehemiah's voice, it was clear that inner dialogue raised a positive creative response with aspirations for transformation of the challenges related to intergenerational poverty. However, Nehemiah's voice revealed a need for agency, problem-solving and goal-setting skills in setting priorities to break the cycle of intergenerational poverty for a better future in a zone of being. It was clear that Nehemiah aspired for a generative lifestyle to improve his health, well-being and quality of life of his family and future children, which reveal the understanding of positive occupational legacy and contribution to others.

> "In my case, passing through all these obstacles and going through each and every one of them to reach my occupation will be my legacy and I'll probably tell my children. I went through this and that, like my father told me, they can basically use that as a motivation for themselves. I actually want to provide for my family one day and even though my parents didn't always have for me. To go places or stuff like that or even being in a better school, I would help them anyway, and financially… having no traditions and stuff, urges me to do it with my family one day, so I would want to have traditions with them, when I have my own family." **(Nehemiah)**

Decoloniality of *'belonging'* in collective occupation.

The last theme deals with the ubiquitous efforts, capacities and moral duties that enabled participants' creative participation in collective occupations that promoted

belonging, connecting and contributing to others. This theme is resonant with Nehemiah's and Michael's view of generative efforts within families that cultivated a sense of belonging through *"inclusivity within the family and creating bonds and also the importance of family."* Hence, Michael concurred that families' inclusivity involves capacities of accommodating each other as part of their *"Legacy that would passed down from a generation to another generation … that's influenced you either as a person or as a group… We all have an equal view and that obviously sometimes you have to sacrifice because you can't always want…so at the end of the day you have to sacrifice for one another and see what outcome will benefit everyone the best."*

This theme provides evidence of asset-based community development and a sense of pleasure and joy among the participants who engaged in collective occupations that contributed to others in the community as part of volunteer efforts passed on by their generative parents. Irene shared, *"As a family we contribute to charity and I think that is a very nice thing because I can also say that growing up without a mother, you are an orphan because a mother plays a big role in your life. My father is giving to charity and sponsoring organizations"*. The involvement of the father figure in passing on a positive occupational legacy to young girls appeared as a capacity building strategy to develop their communication, networking and investment skills. Occupational modelling was evident in Aviwe's story *"I always tell myself that whatever I do, I do it for my father…I can communicate with people and socialise, learning that from my father because he's a priest and investor too. So, he does a lot of that and he even takes me to some of his meetings to learn some business stuff"*

There were three stories that emerged from the young people's voices, which engrained in the importance of imparting morality to other-regarding duties as part of psychological material that promotes "decolonial love and its ethics of all humans living together harmoniously"[43:384]. The critical reflections highlighted that a morality of duties forms part of a positive occupational legacy that is firmly entrenched in personhood and collective occupations of connecting to others. Octavia said that there is a need "to always respect people and if people needs your help you shouldn't say no, because one day you might need them too." This is echoed by Michael who said, *"…things such as like integrity, respect, always learn to respect your elders, do the right thing when no one's looking as it's easy to do the correct things when people are watching and that but the real value comes when none's looking."* Subsequently, Shaun said that *"legacy is the moral values which were given to you and how you use it in your daily activities and how you will influence someone's lives positively…"*

> Despite the fact that the participants were living in under-resourced townships with structural constraints related to social and economic inequalities; however, they managed to engage in occupations that enhanced their internal capacities such as resilience, internal motivation, and presentation as well as people skills. Drawing from the voice of a diplomat, it was evident that Nehemiah's creative response to the obstacles showed that he was tactful and skilful in managing social relations, handling people in the community, which resulted in a sense of community. "I have learned to pass down as a youth ambassador. I went to camps, I spoke to the youth and we created awareness for youth to be uplifted in the community not to choose wrong or not to follow the influence of the world… but to choose for themselves and to know what's right for them. I draw my influences from the strongest friends that we gather with almost every weekend, and we speak about different stuff that we value most and the progress between us and that's kind of an upliftment on myself". **(Nehemiah)**

One of the eight participants shared that some of the things related to the occupations that they used to engage in tend to evoke pleasant memories of their grandparents. This is evident in the voice of a reminiscer known as Cecilia who shared that *"the way how I do things, it is like my grandmother or my grandfather did it too, so it reminds me of them"*

DISCUSSION

The findings emerging from this study demonstrated that occupational legacy is a strategy of human occupation that resonates with the meliorism and knowledge mobilisation that enabled young people to engage in hopeful efforts to solve problems that influenced their daily lives[55]. It was evident that the young people had hopes and aspirations to improve their capacities to live healthy, satisfying lives through trajectories of solving problems for themselves and involvement of others[55]. Consistent with the melioristic intent[44,55], our findings indicate that the young people consciously used the lessons learned from the occupation of storytelling that they engaged in with their grandparents and parents. It was further noted that the occupation of storytelling enabled the young people to rethink and reconstruct their future possible selves so that they may liberate themselves from the oppressive social structures and conditions that are existing in their present moments. However, this study also offers an understanding of the significance of the principle of continuity of change that emanated from the transactional perspective of occupation[56]. Specifically, the findings from all the themes indicated that the young people used their time and space to reflect on their challenges that stemmed from the social and economic inequalities. The findings revealed that the young people's human agency was unmasked in their critical reflection because they had melioristic intent to empower and transform their lives. It was evident in the stories of Nehemiah and Thando that occupational reconstructions opened up spaces so that they could use their concerted efforts and new ways of thinking that honed their problem-solving capacities. The findings heighten that the young people's human agency was mobilised to the extent that they were able to use knowledge learned from their obstacles and involvement in youth camps to influence others in their families and community. In supporting the meliorism perspective, our findings indicated that the young people were intrinsically motivated and exercised their

freedom to engage in social participation with friends to share their occupational legacies. Ultimately, these findings contribute to the body of occupational science because social participation as an occupation contributed to the efforts and capacities of the young people, as they were able to adapt to the environmental changes and obstacles, and to flourish[57].

Problematic situations related to health compromising occupations, such as substance use, smoking, and drugs were dark sides that perpetuated interpersonal violence, family conflicts and parents' separation among the families. These findings pointed out the dark side of the occupations that seem to influence the young people's family function, emotional, physical, psychological, social, and spiritual capacities[58]. However, the findings indicated that the young people had high efficacy, which enabled their occupational choices so that they set goals and exert more effort with persistence to achieve future goals. The problematic situations seem to have assisted the young people to understand their everyday life and adjustments that were needed to experiment and solve problems[56]. Our findings add valuable contribution to occupational resilience[59], which suggests that occupational therapists should consider the capacities, talents, skills and aspirations of the young people living in problematic situations so that they may successfully perform their valued occupations. The findings of the current study show that the young people developed habits and behavioural strategies that supported their engagement in spiritual occupation such as prayer, bible reading, and spiritual dance to deal with the stresses emanating from intergenerational poverty. These findings further show that the young people's capacities to deal with their lives were enhanced, which resonates with occupational resilience[59]. This is further consistent with the efforts of problem-solving that corroborate with the decoloniality of belonging in collective occupation, which supported optimistic thoughts that were not only enhancing but preventing debilitation. The young people learned to implement the strategies of problem-solving that involved identification of the barriers, creation of action plans, and evaluation of the outcomes and change of plans[56,60].

The findings of the current study are consistent with collective occupations that contribute to others and advancement of common good[61]. This is evident in the decoloniality of belonging in collective occupation that promoted compassion and solidarity morale. Our findings further contribute to Smith's expression of "We all Bantu. We have each other"[62:476], which highlighted the importance of giving back to the community as a collective occupation providing the young people with opportunities to learn altruistic capacities and form social networks. These findings supported the contributing occupation that enabled young people's sense of meaning and purpose in life[36]. These findings further suggest that families are repositories of personhood, relational virtues, kindness and generosity that entails morality of duties that prioritises the well-being of all[11,24]. This might explain the melioristic intent and agentic efforts that motivated the young people to engage in meaningful occupation, which supports occupational decision-making[63]. Additionally, the findings highlight that the young people leveraged in the contextually driven cluster of opportunities and choices to address their problematic situations through hope and engagement[45,63]. Thus, the findings suggest that occupational legacy is a strategy that might be used to preserve collective occupations in families.

The strategy of occupational legacy contributes to the decolonial turn of collective occupations because the young people's engagement assisted in the reconstruction of their upbringing complexities such as family disruptions, strict parental practices, relational power between parent-child relationship and patriarchal hegemonies. The findings support occupational reconstruction because the young people engaged in social changes to address the hetero-patriarchal gender roles and bullying[43]. However, these complexities did not create only occupational opportunities and occupational reconstruction but also social transformation in the families. The stories of Aviwe's family conflicts with her father and grandmother provided an example of continuity and change, family cohesion, peace and harmony. Hence, the findings show that the stabilisation behavioural patterns of the family members illuminated healthy social relationship and interaction, which enabled occupational modelling. This is also consistent with the findings that demonstrated that family members influence one another to shape their moral values, which can be used for decoloniality of belonging in human occupation. In the present study, young people were willing to learn, which enhanced the decolonial attitude to love their parents who exposed them to opportunities that were motivated by personal capacities, socio-cultural values and beliefs[57]. Therefore, occupational therapists should consider legacies that add to a growing body of collective and intergenerational occupations that may be guided by the theory of ObCD and occupation-based groups for young people who need to enhance their capacities[64,65,66]. Occupational legacy should be integrated with the ABCD and sustainable goals of good health and well-being, quality education, gender equality, reduced inequalities, sustainable cities and communities, peace, justice and strong institutions as well as partnership[67].

Limitations of the study

The scope of this study was limited in terms of time constraints, school schedules and understanding of occupational therapy terminology, as the co-authors were attempting to apply pluriversality which entails inclusivity, fairness and respect of multiple views. With regard to research setting, only young people from the Western Cape Province were recruited which might be a limitation. However, an institutional ethnography study that focuses on young people's everyday lives, how their lives are organised and what people do as knowers and doers in relation to occupational legacy is needed[68].

CONCLUSION

This study provided an insight into the importance of occupational legacy strategy in facilitating a decolonial turn of human occupation that enable people to use their physical,

psychological, emotional, spiritual and cognitive capacities to ameliorate their problematic situations emanating from the South African Apartheid and colonial historical events, social and economic inequalities. The findings of the study indicated that greater efforts are needed to ensure that occupational legacy embraces decolonial attitudes of love and understanding with a melioristic intent to contribute to human occupation and altericity. The findings heightened that occupation is important in continuity and change through decoloniality and the dimensions of occupation that intrigued the meaning and purpose of occupational engagement in storytelling, prayer, spiritual dance and social participation. Overall, the study provided evidence that problematic situations did not debilitate the young people; however, they motivated them to be agentic and optimistic then engage in morality of duties that enabled occupational reconstructions and occupational resilience.

Author Contributions

Thuli G. Mthembu made substantial contributions to the conceptualisation of the research, literature control, research methodology, analysis, findings, and structuring, supervised report writing and drafting and revised the manuscript critically. Megan Alexander participated in drafting the work and revising critically. Whelan G. Julius, Kristen Havenga, Irvin T. Mwadira, and Kayla Oliver were undergraduate students at the time of the research, as part of the fulfilment of their degree requirements at UWC. They all participated in the conception of the research, literature control, research methodology, data collection, analysis, findings, structuring, and critical read the manuscript.

Competing interests

The authors declare that they have no competing interests related to financial or personal relationships that might inappropriately influence them in writing this article. If there are any, if not make a statement to that effect.

Acknowledgements

The authors would like to thank the participants for sharing the valuable stories about their occupational legacies.

REFERENCES

1. Lundgren B, Scheckle E. Hope and future: youth identity shaping in post-apartheid South Africa, International Journal of Adolescence and Youth. 2019; 24(1):51-61. Available from: https:/doi.org/10.1080/02673843.2018.1463853
2. Mattes R. The "Born Frees": The prospects for generational change in post-apartheid South Africa. Australian Journal of Political Science. (2012). 47(1):133–153. Available from: https:/doi.org/10.1080/10361146.2011.643166
3. Budlender D, Lund F. South Africa: A Legacy of Family Disruption. Development and Change. 2011; 42(4): 925-946. Available from: https:/doi.org/10.1111/j.1467-7660.2011.01715.x
4. Meuser TM, Mthembu TG, Overton BL, Roman NV, Miller RD, Lyons KP, Carpenter BD. Legacy beliefs across generations: Comparing views of older parents and their adult children. The International Journal of Aging and Human Development. 2019; 88(2):168-186. Available from: https:/doi.org/10.1177/0091415018757212
5. Riley J. Shaping textile-making: Its occupational forms and domain. Journal of Occupational Science. 2011; 18(4):322-338. Available from: https:/doi.org/10.1080/14427591.2011.584518
6. Ramugondo EL. Intergenerational play within family: The case for occupational consciousness. Journal of Occupational Science. 2012; 19(4):326-340, https:/doi.org/10.1080/14427591.2012.710166
7. Silverman PR, Baker J, Cait CA, Boerner K. The effects of negative legacies on the adjustment of parentally bereaved children and adolescents. OMEGA - Journal of Death and Dying. 2003; 46(4): 335–352. Available from: https:/doi.org/10.2190/AC8P-7CAY-LF55-YXKR
8. American Occupational Therapy Association. Occupational therapy practice framework: Domain and process (4th ed.). American Journal of Occupational Therapy. 2020; 74(Suppl. 2), 7412410010. Available from: https:/doi.org/10.5014/ajot.2020.74S2001
9. Bourdieu P. The three forms of theoretical knowledge. Social Science Information. 1973; 12(1):53–80. Available from: https:/doi.org/10.1177/053901847301200103
10. Hadfield LA. Steve Biko and the Black Consciousness Movement. 2017. Available from: https:/doi.org/10.1093/acrefore/9780190277734.013.83
11. Molefe M. Critical comments on Afro-communitarianism: The community versus individual. Filosofia Theoretica: Journal of African Philosophy, Culture and Religions. 2017; 6(1):1-22. Available from: https:/dx.doi.org/10.4314/ft.v6i1.1
12. Martsolf DS, Draucker CB. The legacy of childhood sexual abuse and family adversity. Journal of nursing scholarship: An official publication of Sigma Theta Tau. International Honor Society of Nursing. 2008; 40(4):333–340. Available from: https:/doi.org/10.1111/j.1547-5069.2008.00247.x
13. SmithBattle L. Family legacies in shaping teen mothers' caregiving practices over 12 years. Qualitative Health Research. 2006; 16(8):1129–1144. Available from: https:/doi.org/10.1177/1049732306290134
14. Gordon LR. Shifting the geography of reason in an age of disciplinary decadence. Transmodernity: Journal of Peripheral Cultural Production of the Luso-Hispanic World 1.2. 2011; 95-103. Available from: https:/doi.org/10.5070/T412011810
15. Mignolo WD, Tlostanova MV. Theorizing from the Borders: Shifting to Geo- and Body-Politics of Knowledge. European Journal of Social Theory. 2006; 9(2): 205–221. Available from: https:/doi.org/10.1177/1368431006063333
16. Ndlovu M. Coloniality of knowledge and the challenging of creating African futures. Ufahamu: A Journal of African Studies. 2018; 40(2):95-112. Available from: https:/doi.org/10.5070/F7402040944
17. Maldonado-Torres N. Thinking through the decolonial turn: Post continental interventions in theory, philosophy, and critique-- An introduction. Transmodernity: Journal of Peripheral Cultural Production of the Luso-Hispanic World. 2011; 1(2): 1-15. Available from: https:/doi.org/10.5070/T412011805
18. Mignolo WD. Epistemic disobedience and decolonial option: A manifesto. Transmodernity. 2011;44–66. Available from: https:/doi.org/10.5070/T412011807

19. Dickie VA. The role of learning in quilt making. Journal of Occupational Science. 2003; 10(3):120-129. Available from: https:/doi.org/10.1080/14427591.2003.9686519
20. Maldonado-Torres, N. On the coloniality of being: Contribution to the development of a concept. Cultural Studies. 2007; 21(2-3):240-270. Available from: https:/doi.org/10.1080/09502380601162548
21. Mthembu TG. A commentary of occupational justice and occupation-based community development frameworks for social transformation: The Marikana Event. South African Journal of Occupational Therapy. [Internet]. 2021; 51(1):72-75. Available from: http:/dx.doi.org/10.17159/2310-3833/2021a10
22. Markmann CL. Black skin, white mask Frantz Fanon. London: Pluto; 1986.
23. Ndlovu-Gatsheni SJ. Decoloniality as the future of Africa. History Compass. 2015; 13(10):485–496. Available from: https:/doi.org/10.1111/hic3.12264
24. Dirette DP. Decolonialism in the profession: Reflections from WFOT. The Open Journal of Occupational Therapy. 2018; 6(4), Article1. Available from: https:/doi.org/10.15453/2168-6408.1565
25. Ramugondo E. Healing work: intersections for decoloniality. World Federation of Occupational Therapists Bulletin. 2018; 74(2): 83-91. Available from: https:/doi.org/10.1080/14473828.2018.1523981
26. Swarts S, Soudien C. Developing young people's capacities to navigate adversity. In: De Lannoy A, Swart S, Lake I, Smith C, editors. South African child gauge: Youth and intergenerational transmission of poverty. Cape Town, RSA: Children's Institute, University of Cape Town. 2015. p.92-97. Available from: http:/hdl.handle.net/20.500.11910/15389
27. Cairncross E, Kisting S. Platinum and gold mining in South Africa: The context of the Marikana massacre. NEW SOLUTIONS: A Journal of Environmental and Occupational Policy. 2016; 25(4): 513–534. Available from: http:/doi.org/10.1177/1048291115622027
28. Du Plessis AL. The zone of non-being: When belonging becomes more important than being. In die Skriflig. 2018; 52(1): a2364. Available from: https:/doi.org/10.4102/ids. v52i1.2364
29. Ndlovu-Gatsheni SJ. The Entrapment of Africa within the Global Colonial Matrices of Power: Eurocentrism, Coloniality, and Deimperialization in the Twenty-first Century. Journal of Developing Societies. 2013; 29(4): 331–353. https:/doi.org/10.1177/0169796X13503195
30. Seroto J. Dynamics of decoloniality in South Africa: A critique of the history of Swiss mission education for indigenous people. Studia Historiae Ecclesiasticae. 2018; 44(3): #3268, 14 pages. Available from: https:/doi.org/10.25159/2412-4265/3268
31. Otunnu O. Mwalimu Julius Kambarage Nyerere's philosophy, contribution, and legacies, African Identities. 2015; 13(1): 18-33, Available from: https:/doi.org/10.1080/14725843.2014.961278
32. West C. Miami Book Fair International held on the campus of Miami Dade College on November 22-23 [Video]. 2014. Available from: https:/www.c-span.org/video/?322768-8/black-prophetic-fire (Accessed 18 February 2021).
33. Moya PML. The Search for Decolonial Love: An Interview with Junot Díaz. Bostonn Review June 26, 2012. Available from: http:/bostonreview.net/books-ideas/paula-ml-moya-decolonial-love-interview-junot-d%C3%ADaz (Accessed on 18 February 2021).
34. Galvaan R. Generative disruption through occupational science: Enacting possibilities for deep human connection. Journal of Occupational Science. 2021; 28(1):6-18. Available from: https:/doi.org/10.1080/14427591.2020.1818276
35. Maldonado-Torres N. Frantz Fanon and the decolonial turn in psychology: From modern/colonial methods to the decolonial attitude. South African Journal of Psychology. 2017; 47(4): 432-441. Available from: http:/doi.org/10.1177/0081246317737918
36. Hammell KRW. Belonging, occupation, and human well-being: An exploration: Appartenance, occupation et bien-être humain : Une étude exploratoire. Canadian Journal of Occupational Therapy. 2014; 81(1): 39–50. Available from: https:/doi.org/10.1177/0008417413520489
37. Asu OT, Ekwok LF, Chimezie A. Exploring the neglect of African family value system and its effects on sustainable development. American Journal Human Ecology. 2014; 3(3): 43-50. Available from: https:/doi.org/10.11634/216796221403585
38. Kreppner K. The child and family: Interdependence in developmental pathways. Psicologia: Teoria e Pesquisa. 2000; 16(1): 11-22. Available from: https:/doi.org/10.1590/S0102-37722000000100003
39. Loukianov A, Burningham K, Jackson T. Young people, good life narratives, and sustainable futures: The case of Instagram. Sustainable Earth. 2020; 3: 11. Available from: https:/doi.org/10.1186/s42055-020-00033-2
40. Galvaan R, Gretschel P, Motimele M. Theme: Contextually responsive scholarship and praxis of human occupation. 2021; 51(4): 2-3. Available from: http:/dx.doi.org/10.17159/2310-3833/2021/vol51n4a1
41. Ndlovu-Gatsheni SJ. Global coloniality and the challenges of creating African futures. Strategic Review for Southern Africa [Internet]. 2020; 36(2): 181-202. Available from: http:/dx.doi.org/10.35293/srsa.v36i2.189
42. Galvaan R, Peters L, Richards LA, Francke M, Krenzer M. Pedagogies within occupational therapy curriculum: Centering a decolonial praxis in community development practice. Cadernos Brasileiros de Terapia Ocupacional. 2022; 30(spe), e3133. https:/doi.org/10.1590/2526- 8910.ctoAO24023133
43. Frank G, Muriithi BAK. Theorising social transformation in occupational science: The American Civil Rights Movement and South African struggle against apartheid as 'Occupational Reconstructions'. South African Journal of Occupational Therapy. [Internet]. 2015; 45(1):11-19. Available from: http:/dx.doi.org/10.17159/2310-3833/2015/v45no1a3
44. Frank G, Santos V. Occupational reconstructions: resources for social transformation in challenging times. Cadernos Brasileiros de Terapia Ocupacional. 2020; 28(3):741-745. Available from: https:/doi.org/10.4322/2526-8910.ctoED2802
45. Ndlovu-Gatsheni SJ. Geopolitics of power and knowledge in the COVID-19 pandemic: Decolonial reflections on a Global crisis. Journal of Developing Societies. 2020; 36(4): 366–389. Available from: http:/doi.org/10.1177/0169796X20963252
46. Frank AW. Letting Stories Breathe: A Socio-narratology.

Chicago: The University of Chicago Press; 2010.
47. Clandinin DJ. Narrative inquiry: A methodology for studying lived experience. Research Studies in Music Education. 2006; 27(1):44–54. Available from: https:/doi.org/10.1177/1321103X060270010301
48. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. Administration and Policy in Mental Health. 2015; 42(5): 533–544. Available from: https:/doi.org/10.1007/s10488-013-0528-y
49. Etikan I, Musa SA, Alkassim RS. Comparison of convenience sampling and purposive sampling. American Journal of Theoretical and Applied Statistics. 2016; 5(1): 1-4. Available from: https:/doi.org/10.11648/j.ajtas.20160501.11
50. Republic of South Africa. Protection of Personal Information Act, Publishing No. 4 of 2013, Government Printers, Pretoria; 2013.
51. Muylaert CJ, Sarubbi V, Jr Gallo PR, Neto ML. Narrative interviews: An important resource in qualitative research. Revista da Escola de Enfermagem da U S P. 2014; 48(2): 184–189. Available from: https:/doi.org/10.1590/S0080-623420140000800027
52. Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: Striving to meet the trustworthiness criteria. International Journal of Qualitative Methods. 2017; 16: 1-13. Available from: https:/doi.org/10.1177/1609406917733847
53. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006; 3(2):77–101. Available from: http:/doi.org?10.1191/1478088706qp063oa
54. Fijal D, Beagan BL. Indigenous perspectives on health: Integration with a Canadian model of practice. Canadian Journal of Occupational Therapy, 2019; 86(3): 220–231. Available from: https:/doi.org/10.1177/0008417419832284
55. Baranek GT, Frank G, Aldrich RM. Meliorism and knowledge mobilization: Strategies for occupational science research and practice. Journal of Occupational Science. 2021; 28(2):274-286. Available from: https:/doi.org/10.1080/14427591.2020.1824802
56. Fritz H, Cutchin MP. The transactional perspective on occupation: A way to transcend the individual in health promotion interventions and research. Journal of Occupational Science. 2017; 24(4):446-457. Available from: https:/doi.org/10.1080/14427591.2017.1366354
57. Wilcock A. A theory of the human need for potential. Journal of Occupational Science. 1993; 1(1): 17-24. Available from: https:/doi.org/10.1080/14427591.1993.9686375
58. Twinley R. The dark side of occupation. In: Jacobs K, MacRae N, editors. Occupational therapy essentials for clinical competence. 3rd ed. Thorofare, NJ: SLACK Incorporation; 2017. p.29-36.
59. Muriithi B, Murithii J. Occupational resilience: A new concept in occupational science. American Journal of Occupational Therapy. 2020; 74(4S1), 7411505137p1. Available from: https:/doi.org/10.5014/ajot.2020.74S1-PO3508
60. Hill-Briggs F, Lazo M, Peyrot M, Doswell A, Chang YT, Hill MN, Levine D, Wang NY, Brancati FL. Effect of problem-solving-based diabetes self-management training on diabetes control in a low income patient sample. Journal of General Internal Medicine. 2011; 26(9): 972–978. Available from: https:/doi.org/10.1007/s11606-011-1689-6
61. Ramugondo E, Kronenberg F. Explaining Collective Occupations from a Human Relations Perspective: Bridging the Individual-Collective Dichotomy, Journal of Occupational Science, 2015; 22(1): 3-16. Available from: https:/doi.org/10.1080/14427591.2013.781920
62. Smith YJ. We all Banti – We have each other: Preservation of social capital strengthens during forced migration. Journal of Occupational Science, 2013; 20(2):173-184. Available from: https:/doi.org/10.1080/14427591.2013.786647
63. Parnell T, Whiteford G, Wilding C. Differentiating occupational decision-making and occupational choice. Journal of Occupational Science. 2019; 26(3):442-448. Available from: https:/doi.org/10.1080/14427591.2019.1611472
64. Galvaan R. Unmasking Occupation based Community Development: Decolonial perspectives ObCD at SII ObCD at SII ObCD.at SII Decolonial perspective: coloniality of power. 2017. Conference: Occupational Science Europe. Available from: https:/www.researchgate.net/publication/340022941_Unmasking_Occupation_based_Community_Development_Decolonial_perspectives_ObCD_at_SII_ObCD_at_SII_ObCD_at_SII_Decolonial_perspective_coloniality_of_power/stats
65. Bazyk S, Bazyk J. The meaning of occupation-based groups for low-income urban youths attending after-school care. American Journal of Occupational Therapy. 2009; 63(1):69–80. Available from: https:/doi.org/10.5014/ajot.63.1.69
66. du Preeze J. Environmental factors enabling occupational well-being of adolescents living in Groendal community. Unpublished Masters Thesis. Bloemfontein, South Africa: University of Free State; 2019. Available from: https:/scholar.ufs.ac.za/xmlui/bitstream/handle/11660/10005/DuPreezJ.pdf?sequence=1&isAllowed=y
67. United Nations. Department of Economic and Social Affairs: Sustainable Development [Internet]. The 17 goals. 2023 [Cited 24 January 2023]. Available from: https:/sdgs.un.org/goals.
68. Kearney GP, Corman MK, Hart ND, Johnston JL, Gormley GJ. Why institutional ethnography? Why now? Institutional ethnography in health professions education. Perspective Medical Education. 2019; 8:17–24. Available from: https:/doi.org/10.1007/s40037-019-0499-0

Experiences of online occupational therapy education during the COVID-19 pandemic at a South African university

AUTHORS
Nonjabulo Ndaba[a]
https://orcid.org/0000-0002-8273-028X
Deshini Naidoo[a]
https://orcid.org/0000-0001-6276-221X
Pragashnie Govender[a]
https://orcid.org/0000-0003-3155-3743

AFFILIATIONS
[a]Discipline of Occupational Therapy, University of KwaZulu-Natal, South Africa

CORRESPONDING AUTHOR
Nonjabulo Ndaba
ndaban1@ukzn.ac.za

KEYWORDS
online curriculum, occupational therapy students, online learning, online teaching, online assessment, student mental health, student support services

HOW TO CITE THIS ARTICLE
Ndaba N, van Heerden N, Heaver J, Rambhuron S, Khan F, Shandu B, Ndlovu I, Naidoo D, Govender P. Experiences of online occupational therapy education during the COVID-19 pandemic at a South African university. South African Journal of Occupational Therapy. Vol 53 No2, August 2023.
DOI: https://doi.org/10.17159/2310-3833/2023/vol53n2a6

DATES
Submitted: July 2022
Reviewed: November 2022
Revised: December 2022
Accepted: January 2023
Published: August 2023

EDITOR
Blanche Pretorius
https://orcid.org/0000-0002-3543-0743

DATA AVAILABLITY
All data derived from this study have been pooled and are presented in this manuscript

FUNDING
The first author is a recipient of Fee Remission from the University of KwaZulu-Natal. The principal author is funded via the New Generation of Academics Programme (nGAP) under the auspices of the Department of Higher Education and Training in South Africa.

ISSN On-line 2310-3833

ABSTRACT

Introduction: The COVID-19 pandemic resulted in a worldwide shift of academic programmes towards a predominantly online forum. There was therefore a need to explore how students experienced these shifts to ensure optimal learning. This study describes students' experiences of online teaching, learning and assessment and perception of their mental health during the COVID-19 pandemic.
Methods: A descriptive cross-sectional quantitative study was employed using a four-part self-administered online survey. Following a pilot study with 11 community service occupational therapists, the survey was sent to all eligible participants (N=118) with a response rate of 85% (n=91). Data were collected from second to fourth year registered occupational therapy students at the University of KwaZulu-Natal in 2021. Data were analysed descriptively using R Studio Suite.
Results: Over 50% of the students reported a positive online experience. Adequate access to infrastructure enabled optimal online learning. However, students experienced difficulty with structuring self-study time, theoretical application and time allocated for online tests. Additional challenges included stress and time management and managing the increased requirements for self-directed learning. Coping was enhanced by the availability and access to student support services.
Conclusion: The key issues identified in the study need to be addressed to enhance online delivery of the curriculum.

IMPLICATIONS FOR PRACTICE
Online teaching, learning, and assessment in occupational therapy curriculum requires review and adaptation to facilitate optimal student learning

On an online platform, or with digital learning, students require support with aspects such as structuring of their self-directed learning time, personal time and stress management

An understanding of the online experiences of students may assist in the development and revision of curricula that are responsive to students' needs and which may aid in optimal learning outcomes.

INTRODUCTION

The World Health Organization (WHO) declared the coronavirus outbreak (COVID-19), a global pandemic in March 2020[1]. Following this, the president[2] announced that South Africa would go into a nationwide lockdown. With this health crisis, the government initiated precautionary measures and implemented restrictions that mandated all higher educational institutions to shut down. This necessitated a transition from

an environment of conventional face-to-face learning to remote and virtual learning, teaching and assessment for all students. This transitional process posed challenges for all South African Universities, especially in health professional education and training[3,4,5] due to the need to rapidly implement an alternate format of teaching and learning[5].

Additionally, the health science programmes had difficulty developing effective methods to present both theory and practical aspects of courses[6]. The University of KwaZulu-Natal (UKZN) has students from diverse socio-economic, educational, and cultural backgrounds therefore, the authors anticipated that the students' experiences with online teaching, learning, and assessment might vary. Additionally, it was expected that access to laptops, networks, support systems and a conducive learning environment could influence students' online learning experience. Moreover, the students 'learning experiences could vary according to their mental health during the COVID-19 pandemic.

Occupational Therapy students at UKZN enrol in a four-year degree programme that comprises theoretical and practical or fieldwork components. The fieldwork components at non-governmental organisations and government hospitals allow for the integration of theory into practice[7,8]. The delivery of both the fieldwork and theory components required adaptation in response to the challenges posed by COVID-19. There was a need to investigate the UKZN occupational therapy students' experience of teaching, learning and assessment. This study, therefore, aimed to (i) describe the students' experiences of teaching, learning and assessment, (ii) describe the students' mental health experiences, (iii) to explore the barriers and enablers to teaching, learning and assessment of the 2nd-, 3rd- and 4th-year Occupational Therapy students' at UKZN.

Following the lockdown, all of the universities in South Africa resumed their academic programmes at different times, which resulted in delays; UKZN was further delayed due to a lack of infrastructure, as previously noted. At the onset of the pandemic, universities were mostly focused on establishing infection control protocols and attending to the biomedical aspects of COVID-19, rather than the effect the pandemic was having on students mental health[9,10]. Students in Higher Education Institution's (HEIs) experienced increased anxiety[11], due to the effect of the pandemic on their livelihoods; in terms of their families financial well-being, meeting the requirements of their bursaries and maintaining their mental health; more so than their academic work[12]. The students' anxiety was further exacerbated by concerns over having accommodation conducive to learning and gaining access to funding. This is particularly relevant at UKZN as the enrolment policy prioritises students from previously disadvantaged backgrounds[3]. Due to lockdown, the entire UKZN student population had to return home. UKZN's transitional approach was slower as blended learning was not uniformly used prior to COVID-19. There was a need to adapt the curriculum and teaching methods so that the online androgogy maintained the university's standards of producing competent graduates[3]. Occupational Therapy is considered a 'hands-on' profession thus, several adaptations had to be made, by educators, to ensure that professional-specific knowledge and skills were achieved[13]. UKZN offered online student support services to ensure that students' mental health needs were addressed. There was limited accessibility and availability to psychological support for students within their living situations, further heightening mental illness vulnerability[10].

Challenges Experienced

Abbasi[4] highlighted that the drawbacks to online learning included: (i) lack of infrastructure, training, and resources (ii) displeasure with keeping up with the course schedules and deadlines, (iii) psychological distress and mental illness among students, and (iv) lack of effectiveness in acquiring the practical skills due to limited clinical exposure. Additionally, online learning disadvantages include: (i) network instability, (ii) unilateral interaction, (iii) reduced concentration for extended periods, and (iv) lack of communication with teachers[14]. Furthermore, students complained of social isolation[15]. A study conducted in India found that students had reservations about virtual learning. Some of the reported challenges that the students faced included: lack of access to internet facilities, proper interaction and ineffective technology[16]. Similarly, a Chinese study[14] reported unstable digital infrastructure and lack of holistic quality assurance systems negatively influenced online teaching and learning. A Canadian study[17] identified that the increasing demand for access to online resources increases concerns of exploitation of resources and the transformation of our perceptions of education. In Nigeria, reduction of international education, disruption of the academic calendar, teaching and learning gap and loss of workforce impacted HEI during the pandemic[18]. In the South African context, many students from low socio-economic contexts lacked conducive learning environments and were dependent on financial aid, thus required support to gain access to online learning resources and materials, which limited online learning feasibility[6,19].

Advantages of Online Teaching, Learning and Assessment in Higher Education

The transition to the online platform created an opportunity for telehealth[3,20] within health science programmes[13]. Additionally, the more extensive use of online learning management platforms such as Moodle and Blackboard[21] and using newer technologies such as polls, Zoom, voice recorded PowerPoints, and tutorials[21] have allowed HEIs to upgrade education delivery methods to incorporate new emerging learning technologies. The use of new technologies allows for increased participation and the ability to revisit material[10]. The additional planning, infrastructure and technology investment ensured a successful transition to the online platform and has allowed for long-term implementation of online teaching into university curricula[22]. Several advantages included[22] (i) comfortable, educational environment[6,19] (ii) reduced travel time; (iii) improved interactions and (iv) satisfaction with academic performance. Academic staff were forced to re-evaluate the curriculum as the transition to an online platform encouraged "problem-solving, critical thinking and applied understanding, by using a holistic and integrated approach" to teaching, learning and assessment

Table I: Demographic profile of students (n=91)

Characteristics		2nd year n (%) 29 (31.9)	3rd year n (%) 37 (40.7)	4th year n (%) 25(27.5)	Overall n (%) 91 (100%)
Gender	Male	4 (13.8)	0 (0)	2 (8)	6 (6.6)
	Female	25 (86.2)	37 (100)	23 (92)	85 (93.4)
Marital Status	Single	23 (79.3)	25 (67.5)	14 (56)	62 (68.1)
	Married	0 (0)	1 (2.7)	0 (0)	1 (1.1)
	In a relationship	6 (20.7)	9 (24.3)	10 (40)	25 (27.5)
	Engaged	0 (0)	2 (5.4)	1 (4)	3 (3.3)
Funding	Private/self-funding	11 (37.9)	13 (35.1)	6 (24)	30 (33)
	NSFAS	17 (58.6)	21 (56.7)	14 (56)	52 (57.1)
	Bursary	1 (3.4)	3 (8.1)	5 (20)	9 (9.9)
Residence before COVID-19 outbreak	With my family/ at home	16 (55.2)	20 (54)	13 (52)	49 (53.8)
	On-campus housing	6 (20.7)	6 (16.2)	5 (20)	17 (18.7)
	Off-campus; far from campus	5 (17.2)	1 (2.7)	3 (12)	9 (9.9)
	Off-campus; close to campus	2 (6.9)	10 (27)	4 (16)	16 (17.5)
Current Residence	With my family/ at home	16 (55.2)	20 (54.1)	14 (56)	50 (54.9)
	On-campus housing	7 (24.1)	8 (21.6)	4 (16.8)	19 (20.9)
	Off-campus; far from campus	4 (13.8)	1 (2.7)	2 (8)	7 (7.7)
	Off-campus; close to campus	2 (6.9)	8 (21.6)	5 (20)	15 (16.5)

methods and approaches[6,1]. Three main principles applied by higher education institutions to provide support engagement in online learning included, (i) equitable access to online resources through data provision and zero-rated resources, (ii) adapting the academic programme to ensure students meet the clinical requirements of the respective regulatory bodies and (iii) ensuring mental health preservation[3]. Success was achieved by HEIs through[23] (i) identifying the independent needs of students, (ii) understanding the unique personal and academic circumstances, and (iii) supporting student time management. Students returning to the residence or on-campus was the most probable solution for students who could not access information and laptops for online learning[24]. HEI's needed to provide accessible mental health-related services and make the curriculum responsive to the changing times[24]. It is essential to investigate the experiences and perceptions of students to examine the challenges faced to further improve the effectiveness of online learning[15,25].

As a result, the various highlights and challenges experienced by occupational therapy students from a specific and unique context in South Africa during the COVID-19 pandemic were explored. The experiences would provide insight and lessons to improve online learning and well-being amongst students in a rapidly changing HEI.

METHODS

Study Design

This quantitative descriptive study used an online self-administered survey. The survey was designed by the authors using relevant pre-existing literature. The study explored occupational therapy students' experiences on their teaching, learning and assessment experiences and mental health experiences during the COVID-19 pandemic.

Study Setting

The study was located in the province of KwaZulu-Natal, South Africa at the only institution that offers occupational therapy training in the province, namely, the University of KwaZulu-Natal.

Study Population and Sampling

The target population for this study included second-, third- and fourth-year students who were enrolled in the occupational therapy programme at the institution for the 2021 academic year (N=118). This included 37 second-year students, 47 third year and 34 fourth-year students. Non-probability census sampling was used to access all eligible students for the study. The pilot study participants (n=11) included community service occupational therapists who were registered students at UKZN and completed their final year of study in 2020. The minimum response rate required for the study to be reliable was 70% (n=83) students according to the Cronbach's Alpha Interval Estimation[26]. The final sample size was n=91. Of these, 93.45 (n=85) were female, and 6.6% (n=6) were male. The mean age was 19.97 years (range 18-28 years). More than half of the students (54.9%) lived at home during the online education period. National Student Financial Aid Scheme (NSFAS) funded the majority of the students (54.9%) across the years (Table I, above).

Data collection and ethical considerations

Potential participants were sent an invitation via email, which included attachments of the information document, consent form; gatekeepers' permission and ethical approval

Table II: Students' access to resources (n=91) per level of study

Satisfaction		2nd year n (%) 29 (31.9)	3rd year n (%) 37 (40.7)	4th year n (%) 25 (27.5)	p-value (Fischer's)	Overall n (%) 91 (100)
Operational laptop	Agree	27 (93.1)	32 (86.5)	22 (88)	p= 0.808	81 (89)
	Disagree	2 (6.9)	5 (13.5)	3 (12)		10 (11)
Operational smartphone	Agree	27 (93.1)	35 (94.6)	25 (100)	p= 0.729	87 (95.6)
	Disagree	2 (6.9)	2 (5.4)	0 (0)		4 (4.4)
Availability of internet	Agree	18 (62)	27 (73)	17 (68)	p= 0.472	62 (68.1)
	Disagree	11 (38)	10 (27)	8 (32)		29 (31.9)
Substantial data provision	Agree	15 (51.7)	21 (56.8)	17 (68)	p= 0.889	53 (58.2)
	Disagree	14 (48.3)	16 (43.2)	8 (32)		38 (41.8)
Learning environment	Agree	15 (51.7)	25 (67.6)	20 (80)	p= 0.123	60 (65.9)
	Disagree	14 (48.3)	12 (32.4)	5 (20)		31 (34.1)
Ability to work with electricity disruptions	Agree	12 (41.4)	14 (37.8)	11 (44)	p= 0.931	37 (40.7)
	Disagree	17 (58.6)	23 (62.2)	14 (46)		54 (59.3)
Online Resource accessibility	Agree	28 (96.6)	32 (86.5)	20 (80)	p= 0.247	80 (87.9)
	Disagree	1 (3.4)	5 (13.5)	5 (20)		11 (12.1)

(reference HSSREC/00002508/2021). Informed consent was mandatory prior to accessing the survey. A non-pervasive incentive (as approved by the ethics committee) was offered to increase voluntary participation. The survey was hosted on Google Forms. Three areas were investigated using a four-point Likert scale ranging from strongly agree (1) to strongly disagree (4). Section A included seven demographic questions, section B included 24 questions related to teaching and learning experiences at an undergraduate level, section C included 10 questions on experiences of students related to the structure of online assessment and section D included eight questions on students' mental health and coping during the COVID-19 pandemic. The survey was opened for a period of six weeks within the mid-year period of the academic programme (June-July 2021).

Data analysis

The data from Google Forms were imported to a MS Excel spreadsheet in preparation for analysis which was conducted in R Statistical computing software of the R Core Team, 2020, version 3.6.327. The demographic profile data were converted into categorical data, and the remaining three sections were converted into statistical data for interpretation. The categorical variables were described as counts and percentage frequencies. Likert plots were used for handling the multidimensional presentation of the categorical data. To determine the association between categorical variables, Chi-Square Test was used. When the distribution of the cross-tabulations contained an expected value of less than five, Fischer's exact test was applied. The internal consistency of a set of items was assessed using the Cronbach alpha and the item-rest correlation. To improve the Cronbach alpha, items with opposite scale direction were reversed and those suppressing the Cronbach were dropped. All the inferential statistical analysis tests were conducted at 5% levels of significance.

Validity and reliability

This study included the quantitative measures of (i) internal validity; (ii) external validity, (iii) reliability. and (iv) objectivity[28]. Internal validity was measured by achieving a Cronbach alpha >0.729. This including the confounding variable, COVID-19 pandemic, as it impacted the individual's experiences of online teaching, learning, and assessment. The effect modifiers in this study were the different experiences between the second-, third- and fourth-year students; measured using Fisher's p-value, where $p<0.05$. External validity can be achieved through generalisability as findings and deductions from a smaller sample (n=91) can be used to deduce a larger sample[30], however, within the South African context. In terms of reliability, this study aimed to have the same responses each time the test is completed by providing a consistent rating scale throughout all sections (excluding the demographics sections) within the survey. The structure of the questions was stated directly to limit the participant's interpretation of the meaning of the question[31]. Measures of anonymity, confidentiality, and objectivity were used to reduce researcher bias. The survey was developed using pre-existing relevant literature, and the findings were verified with alternate literature pertinent to the South African context. The authors, with support from a consulting biostatistician, completed the analysis of the survey responses.

RESULTS

A total of 91 students (n=29) second year, (n=37) third year, and (n=25) fourth year voluntarily participated in the study. This correlated to a response rate of 85%.

Students access to resources

Most of the students across the years were satisfied with their access to an operational laptop (89%; n=81); operational smartphone (95.6%; n=96); availability to the internet (68.1%; n=62); accessibility to online resources (87.9%; n=80); substantial data provision (58.2%; n=53) and having a conducive learning environment (65.9%; n=60). More than half of the students across the years (59.3%; n=54), found it challenging to work around electricity disruptions such as load-shedding (Table II, above).

Table III: Online learning experiences of students in this study (n=91)

Online learning and teaching experience		2nd year n (%) 29 (31.9)	3rd year n (%) 37 (40.7)	4th year n (%) 25 (27.5)	p-value (Fischer's)	Overall n (%) 91 (100)
Easily transitioned	Agree	16 (55.2)	21 (56.8)	12 (48)	p = 0.608	49 (53.8)
	Disagree	13 (44.8)	16 (43.2)	13 (52)		42 (46.2)
Effective learning in online tutorials	Agree	14 (48.3)	13 (35.1)	8 (32)	p = 0.545	35 (38.5)
	Disagree	15 (51.7)	24 (64.9)	17 (68)		56 (61.5)
Actively participate in online lectures	Agree	20 (69)	27 (73)	13 (52)	p = 0.273	60 (65.9)
	Disagree	9 (31)	10 (27)	12 (48)		31 (34.1)
Understood content	Agree	11 (37.9)	7 (18.9)	6 (24)	p = 0.372	24 (26.4)
	Disagree	18 (62.1)	30 (81.1)	19 (76)		67 (73.6)
Easier learning with visual aids	Agree	25 (86.2)	31 (83.8)	15 (60)	p = 0.258	71 (78)
	Disagree	4 (13.8)	6 (16.2)	10 (40)		20 (22)
Structured self-study time well	Agree	14 (48.3)	19 (51.4)	11 (44)	p = 0.880	44 (48.4)
	Disagree	15 (51.7)	18 (48.6)	14 (56)		47 (51.6)
Easily approached lecturers	Agree	18 (62.1)	25 (67.6)	13 (52)	p = 0.051	56 (61.5)
	Disagree	11 (37.9)	12 (32.4)	12 (48)		35 (38.5)
Easier to study with online resources	Agree	17 (58.6)	19 (51.4)	11 (44)	p = 0.245	47 (51.6)
	Disagree	12 (41.4)	18 (48.6)	14 (56)		44 (48.4)
Easily concentrated	Agree	10 (34.5)	16 (43.2)	8 (32)	p = 0.903	34 (37.4)
	Disagree	19 (65.5)	21 (56.8)	17 (68)		57 (62.6)
Learning style was conducive	Agree	25 (86.2)	18 (48.6)	16 (64)	p < 0.001	59 (64.8)
	Disagree	4 (13.8)	19 (51.4)	9 (36)		32 (35.2)
Grasped and applied content	Agree	18 (62.1)	16 (43.2)	11 (44)	p = 0.281	45 (49.5)
	Disagree	11 (37.9)	21 (56.8)	14 (56)		46 (50.5)
Self-motivated	Agree	16 (55.2)	24 (64.9)	14 (56)	p = 0.910	54 (59.3)
	Disagree	13 (44.8)	13 (35.1)	11 (44)		37 (40.7)
Enough time given for self-study	Agree	16 (55.2)	5 (13.5)	10 (40)	p < 0.001	31 (34.1)
	Disagree	13 (44.8)	32 (86.5)	15 (60)		60 (65.9)
Understood expectations	Agree	18 (62.1)	27 (73)	15 (60)	p = 0.305	60 (65.9)
	Disagree	11 (37.9)	10 (27)	10 (40)		31 (34.1)
Easily applied theory	Agree	13 (44.8)	14 (37.8)	8 (32)	p = 0.451	35 (38.6)
	Disagree	16 (55.2)	23 (62.2)	17 (68)		56 (61.5)
Sufficient experience in clinical fieldwork	Agree	20 (69)	30 (81.1)	18 (72)	p = 0.215	68 (74.7)
	Disagree	9 (31)	7 (18.9)	7 (28)		23 (25.3)
Enhanced learning at clinical site	Agree	23 (79.3)	33 (89.2)	19 (76)	p = 0.678	75 (82.4)
	Disagree	6 (20.7)	4 (10.8)	6 (24)		16 (17.6)

Students' online teaching and learning experience

More than half of the students across the years felt that they transitioned easily (53.8%; n=49), could actively participate in lectures (65.9%; n=60), could approach their lecturers easily (61.5%; n=56) and understood the course expectations (65.9%; n=60). More than half of the students were self-motivated (59.3%; n=54); however, there were a large percentage of students who experienced difficulty in structuring their self-study time well (51.6%; n=47) and found inadequate time provided for self-study (65.9%; n=60). Most of the students found it difficult to concentrate during online learning (62.6%; n=57). Although the students across the years found that their learning style was conducive to online learning (64.8%; n= 59) and found it easier when using online resources (51.6%; n=47) and visual aids (78%; n=71); they felt that the online tutorials were not adequate (61.5%; n=56) and struggled to understand the content (73.6%; n=67). Although the students found it challenging to apply the theory (61.5%; n=56), a large percentage felt they had sufficient clinical experience (74.7%; n=68) and that the clinical experience enhanced their learning (82.4%; n=75). All of Fischer's p-values were above p>0.05, except where the students felt they had enough self-study time and a conducive learning style (p<0.001), indicating a significant difference between years (Table III, above).

Student's online assessment experience

Most of the students across the years (63.7%; n=58) felt that they had enough time to complete assignments and the online calendar was adequate (51.6%; n=47); however, majority of the third year (70.3%; n=26) and fourth year (52%; n=13) students felt that they did not have enough time for

Table IV: Online assessment experience of students in this study (n=91)

Online assessment experience		2nd year n (%) 29 (31.9)	3rd year n (%) 37 (40.7)	4th year n (%) 25 (27.5)	p-value (Fischer's)	Overall n (%) 91 (100)
Sufficient time for assignments	Agree	24 (82.8)	16 (43.2)	18 (72)	p = 0.198	58 (63.7)
	Disagree	5 (17.2)	21 (56.8)	7 (28)		33 (36.3)
Sufficient time for online tests	Agree	18 (62.1)	11 (29.7)	12 (48)	p = 0.108	41 (45.1)
	Disagree	11 (37.9)	26 (70.3)	13 (52)		50 (54.9)
Online test format was well structured	Agree	21 (72.4)	23 (62.2)	19 (76)	p = 0.920	63 (69.2)
	Disagree	8 (27.6)	14 (37.8)	6 (34)		28 (30.8)
Easy access to notes during tests	Agree	14 (48.3)	17 (45.9)	13 (52)	p = 0.992	44 (48.4)
	Disagree	15 (51.7)	20 (54.1)	12 (48)		47 (51.6)
Tempted to access notes during tests	Agree	13 (44.8)	17 (45.9)	18 (72)	p = 0.151	48 (52.7)
	Disagree	16 (55.2)	20 (54.9)	7 (28)		43 (42.3)
Performed better in online tests	Agree	20 (69)	30 (81.1)	21 (84)	p = 0.412	71 (78)
	Disagree	9 (31)	7 (18.9)	4 (16)		20 (22)
Easy submission	Agree	24 (82.8)	32 (86.5)	17 (68)	p = 0.007	73 (80.2)
	Disagree	5 (17.2)	5 (13.5)	8 (32)		18 (19.8)
Computer Literacy	Agree	27 (93.1)	33 (89.2)	24 (96)	p = 0.846	84 (92.3)
	Disagree	2 (6.9)	4 (10.8)	1 (4)		7 (7.7)
Adequate online calendar	Agree	15 (51.7)	15 (40.5)	17 (68)	p = 0.312	47 (51.6)
	Disagree	14 (48.3)	22 (59.6)	8 (32)		44 (48.4)
Online test format was realistic	Agree	17 (58.6)	27 (73)	18 (72)	p = 0.255	62 (68.1)
	Disagree	12 (41.4)	10 (27)	7 (28)		29 (31.9)

online tests. Most of the students across the years (69.2%; n= 63) felt that the online test format was well structured and that the format was realistic (68.1%; n=62), resulting in better test performance (78%; n=71). Most of the students felt tempted to access their notes (52.7%; n=48), especially the fourth-year students (72%; n=18); although 51.6% (n=47) of all the students found that it was not easy to access their notes during the online tests. Most of the students across the years felt that it was easy to submit online assessments (80.2%; n=73) and that they were competent in computer literacy (92.3%; n=84). Fischer's p-values were above the recommendation of p>0.05; except submission of assignments (p= 0.007), which indicates a significant difference in experiences of the ease in submissions between the years (Table IV, above).

Student mental health

Although a large portion of the students across the years felt that they coped well with the unexpected implementation of online learning (56%; n=51) and with balancing their personal lives and studies (65.9%; n=60), the results revealed that the students did not cope with time management and planning (63.7%; n=58) and increased self-directed learning (83.5%; n=76). The students felt that they were informed on how to access online resources for mental health assistance (89%; n=81); however, Fischer's p-value was p=0.021, resulting in a significant difference between the years. Many of the students felt that they did not manage their stress well (58.2%; n=53), despite having good support systems (79.1%; n=72) and being able to build and maintain their relationships (78%; n=71) (Table V, page 61).

DISCUSSION

This study provided insight into students' experiences of teaching, learning, assessment and mental health during their transition onto a complete online platform during the COVID-19 pandemic at one higher education institution in South Africa. The study identified that most students had access to infrastructure and resources such as an operational laptop/ smartphone and Wi-Fi, which facilitated engagement with online learning. Existing literature indicates that adequate internet connections have predominantly been a challenge in rural and marginalised communities[15]. Access to Wi-Fi and provision of data were part of the university's initiative, in collaboration with network service providers, to support students' engagement in their online learning tasks. The partnership with network service providers ensured zero-rated access to learning management systems such as Moodle platform[3]. The students reported that they had access to conducive learning environments, despite more than half of the students living at home and funded by NSFAS, indicating that they belonged to a lower socio-economic context. This finding contrasts with Karthard, Galvaan and Kleintjes[23] assertion that students from low socio-economic contexts lacked conducive learning environments that limited the feasibility of online learning. However, load shedding was a significant factor in hindering online learning. This affected the students' internet connectivity and ability to charge their electronic devices to remain on the learning platforms. This may have exacerbated their stress due to falling behind in their academic programme.

Less than half of the students found the sudden implementation and transition to online learning difficult[15],

Table V: Mental Health experience of students in this study (n=91)

Mental health experience		2nd year n (%) 29 (31.9)	3rd year n (%) 37 (40.7)	4th year n (%) 25 (27.5)	p-value (Fischer's)	Overall n (%) 91 (100)
Coped well with unexpected implementation	Agree	18 (62.1)	21 (56.8)	12 (48)	p = 0.919	51 (56)
	Disagree	11 (37.9)	16 (43.2)	13 (52)		40 (44)
Coped well with time management and planning	Agree	11 (37.9)	10 (27)	12 (48)	p = 0.136	33 (36.3)
	Disagree	18 (62.1)	27 (73)	13 (52)		58 (63.7)
Coped well with balancing studies and personal life	Agree	18 (62.1)	24 (64.9)	18 (72)	p = 0.648	60 (65.9)
	Disagree	11 (37.9)	13 (35.1)	7 (28)		31 (34.1)
Managed stress well	Agree	13 (44.8)	13 (35.1)	12 (48)	p = 0.332	38 (41.8)
	Disagree	16 (55.2)	24 (64.9)	13 (52)		53 (58.2)
Informed on accessing online resources	Agree	28 (96.6)	33 (89.2)	20 (80)	p = 0.021	81 (89)
	Disagree	1 (3.4)	4 (10.8)	5 (20)		10 (11)
Good support system	Agree	22 (75.9)	27 (73)	23 (92)	p = 0.222	72 (79.1)
	Disagree	7 (24.1)	10 (27)	2 (8)		19 (20.9)
Built and maintained friendships	Agree	19 (65.5)	30 (81.1)	22 (88)	p = 0.054	71 (78)
	Disagree	10 (34.5)	7 (18.9)	3 (12)		20 (22)
Coped well with increased independent learning	Agree	5 (17.2)	8 (21.6)	2 (8)	p = 0.648	15 (16.5)
	Disagree	24 (82.8)	29 (78.4)	23 (92)		76 (83.5)

resulting in varied online learning experiences amongst the students[6]. The fourth-year students found the transition to online learning more complex than the rest of the students. This could be a result of time pressure and increased requirements of practical learning in the final year of study. Student's felt that they were able to utilise online resources effectively and efficiently. This could be due to conducive learning styles and approaching lecturers easily regarding the course content, which directly contributed to their positive online learning experience[23]. This can also be attributed to the rapid adaptation and adjustment of lecturers to online learning methods and their ability to load their course content onto various online platforms, which provided easy access for students. Despite the challenges some students experienced in transitioning to online learning, students still reported that they were self-motivated to complete their academic year[3]. More than half of the students felt that they did not receive adequate time for self-study tasks prior to online tutorials; this may have directly impacted their ability to understand and apply content into practice[22], and their engagement with lecturers on the course content. The study found that most of the students had difficulty with regards to self-directed learning; application and understanding of course content and poor time management, especially around their self-study schedule[22]. These authors suggested that being able to manage your time and be an autonomous, self-directed learner are factors necessary for successful distance learning[22].

Challenges in students maintaining their attention for extended periods of time[22] which would have directly impacted their learning and understanding of concepts with incompletion of self-study tasks, ineffective learning during online tutorials, and limited interaction with lecturers and peers during tutorials was noted. This is aligned with the available evidence indicating that students become tired and less enthusiastic about learning content with continuing lectures[24]. Students had difficulty applying the theory taught online into clinical practice, a finding acknowledged in the literature prior to COVID-19. Clinical experience during the pandemic enhanced students' learning and acquisition of professional skills to allow for the development of competent students to implement occupational therapy service delivery[7].

Saleh[32] reported an increased number of assignments given to students during online learning instead of traditional face-to-face learning. Despite this, students have had an overall positive experience in terms of online assignments as they felt they received sufficient time for completion with an uncomplicated submission process. Students found that they performed better in online tests as opposed to traditional face-to-face tests. This could be associated with the easy access to notes during the online tests. To mitigate this, lecturers removed/restricted access to notes from learning platforms to prevent access to notes during test completion. However, students expressed issues over the time allocated for the online tests. This could be as a result of test structure and competency with computer literacy and efficiency. To mitigate this limitation, students commented that they would prefer to have reading time prior to online tests due to the need to read case studies and answer essay questions in a realistic time period[32]. A change in approach to planning and implementing assessments could facilitate enhanced performance and alleviate stress caused by time constraints.

Overall, more than half of the students felt that they did not manage their stress well. This could result from the sudden implementation of online learning, trying to manage their time and increased self-directed learning. Kathard, Galvaan and Kleintjes[23], reported that students' stress during the COVID-19 pandemic was exacerbated by

the additional stress of their family's physical health and financial stressors. Copeland *et al*[13] noted that the COVID-19 pandemic had increased the prevalence of depressive and anxious symptoms among university students. More than half of students felt that they had a good support system, which is essential in alleviating mental stress caused by the implications of the pandemic[11]. The students felt they were informed about accessing online mental health resources, such as the telehealth support platform and student support services, which aim to provide accessible interventions and address their mental health concerns[3]. Additionally, students felt that they were able to build and maintain their friendships easily, however, the comments denoted that due to social isolation, this further impacted the student's anxiety; motivation and coping skills[7].

CONCLUSIONS AND RECOMMENDATIONS

The COVID-19 pandemic brought about a rapid shift in the way that teaching, learning, and assessment were conducted. In this study, we found that overall, students adapted to online learning and had notable experiences at their HEI during the pandemic which has implications for online learning and blended learning approaches in occupational therapy education. In terms of online assessments, students mostly had a positive experience, and this was reflected in their performance. With regards to the student's mental health, they felt that they coped adequately and found that their learning style was conducive. However, issues arose as a result of having increased self-directed learning and in managing their time and stressors. Providing students with adequate online learning infrastructure; online resources; continuous communication, and mental health support will help ensure optimal and effective online learning. Moreover, further consideration is required around learning during tutorials; understanding content; applying theory into practice; and managing self-study time.

A number of specific recommendations have emanated from this study. These include student assessment which may be enhanced by limiting accessibility to learning materials during the test period and in regulating the duration of online tests. Students should be guided on how to optimise self-directed learning, with particular focus on increased structure[10], including study breaks into the daily plan; which will optimise attention and promote stress and time management skills[3,22]. Future research should focus on exploring means to optimise effective online teaching and learning by restructuring of theoretical content of the curriculum and delivery of online tutorials.

Limitations of the study

We acknowledge several limitations of this study. Firstly, exploration of students mental health could not be adequately captured using quantitative methods and therefore in-depth exploration via qualitative methods may provide a more comprehensive and authentic picture of students' mental health and challenges. Thus a future studies could delve deeper into the lived experiences of students. Secondly, the timing of the study can be considered as a limitation as the initial experiences of online learning had passed; most students were already 18 months into this process and it is very likely that the more positive experiences were as a result of initial challenges being addressed. The results may rather then reflect residual challenges that students had experienced.

Acknowledgements

The biostatistician, Dr. Partson Tinarwo, is duly acknowledged for his assistance in the data analysis process.

Author contributions

Nonjabulo Ndaba, Pragashnie Govender and Deshini Naidoo as supervisors of the study, co-conceptualised the study. Nicole van Heerden, Jessica Heaver, Sonali Rambhuron, and Fariyah Khan, as registered students at UKZN, collected data and completed initial analysis of the data. Pragashnie Govender and Deshini Naidoo assisted in data interpretation, together with Nonjabulo Ndaba. Nicole van Heerden, Jessica Heaver, Sonali Rambhuron, and Fariyah Khan drafted the first version of paper. Pragashnie Govender, Deshini Naidoo and Nonjabulo Ndaba revised the paper and reviewed the final version of the paper.

Conflict of interest

The authors declare no conflict of interest in relation to publication of this article.

REFERENCES

1. Mhlanga D, & Moloi, T. COVID-19 and the Digital Transformation of Education: What Are We Learning on 4IR in South Africa? Education Sciences. 2020;10(7):180. https://dx.doi.org/10.3390/educsci10070180.
2. Ramaphosa, C. Speeches | South African Government [Internet]. Gov.za. 2020. Available from: https://www.gov.za/speeches/president-cyril-ramaphosa-extension-coronavirus-covid-19-lockdown-end-april-9-apr-2020-0000
3. Govender P, Naidoo D, van Wyk JM. A 3Ts (teaching in troubled times) response to COVID-19 in South Africa. The Clinical Teacher. 2020;17(4):427-9. https://dx.doi.org/10.1111/tct.13213.
4. Abbasi MS, Ahmed N, Sajjad B, Alshahrani A, Saeed S, Sarfaraz S, Alhamdan RS, Vohra F, Abduljabbar T. E-Learning perception and satisfaction among health sciences students amid the COVID-19 pandemic. Work. 2020:1-8. https://dx.doi.org/10.3233/WOR-203308.
5. Daniel J. Education and the COVID-19 pandemic. Prospects, 2020; 49(1): 91-6. DOI: https://dx.doi.org/10.1007/s11125-020-09464-3.
6. Hedding DW. Payouts push professors towards predatory journals. Nature. 2019;565(7737):267-8. Available from: https://go.gale.com/ps/i.do?id=GALE%7CA573274180&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=00280836&p=HRCA&sw=w&userGroupName=anon%7E60b97b68
7. Naidoo D, & Van Wyk J. Fieldwork practice for learning: Lessons from occupational therapy students and their supervisors. African Journal Of Health Professions Education,. 2016;8(1):37. https://dx.doi.org/10.7196/AJHPE.2016.v8i1.536.
8. University of KwaZulu-Natal. Hands-On Opportunities – Discipline of Occupational Therapy [Internet]. 2021. Available

from: https://ot.ukzn.ac.za/hands-onopportunities
9. Nguse S, Wassenaar D. Mental health and COVID-19 in South Africa. South African Journal of Psychology. 2021;5:304-313. https://journals.sagepub.com/doi/pdf/10.1177/00812463211001543
10. Sahu P. Closure of universities due to coronavirus disease 2019 (COVID-19): impact on education and mental health of students and academic staff. Cureus. 2020;12(4). https://dx.doi.org/10.7759/cureus.7541.
11. Shenoy V, Mahendra S, Vijay N. COVID 19 lockdown technology adaption, teaching, learning, students engagement and faculty experience. Mukt Shabd Journal. 2020;9(4):698-702.
12. Gittings L, Toska E, Medley S, Cluver L, Logie C, Ralayo N et al. 'Now my life is stuck!': Experiences of adolescents and young people during COVID-19 lockdown in South Africa. Global Public Health [Internet]. 2021;16(6):947-963. https://dx.doi.org/10.1080/17441692.2021.1899262.
13. Sy MP, Pineda RC, Yao DP, Guevara CA, Delos Reyes RC, Castro IM. Shared voices of Filipino occupational therapists during the COVID-19 pandemic: reflections from an online forum. World Federation of Occupational Therapists Bulletin. 2020;76(1):60-4. https://dx.doi.org/10.1080/14473828.2020.1761575
14. Zhu X, Liu J. Education in and After Covid-19: Immediate Responses and Long-Term Visions. Postdigital Science and Education, 2020; 2(3): 695-699. https://dx.doi.org/10.1007/s42438-020-00126-3.
15. Visser M, Law-van Wyk E. University students' mental health and emotional wellbeing during the COVID-19 pandemic and ensuing lockdown. South African Journal of Psychology. 2021;51(2):229-243. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8144883/
16. Adnan M, Anwar K. Online Learning amid the COVID-19 Pandemic: Students' Perspectives. Online Submission. 2020;2(1):45-51. https://files.eric.ed.gov/fulltext/ED606496.pdf
17. Burns R. A COVID-19 panacea in digital technologies? Challenges for democracy and higher education. Dialogues in Human Geography. 2020;10(2):246-249. https://doi.org/10.1177%2F2043820620930832
18. Jacob O, Abigeal I, Lydia A. Impact of COVID-19 on the Higher Institutions Development in Nigeria. Electronic Research Journal of Social Sciences and Humanities [Internet]. Eresearchjournal.com. 2020 [cited 16 October 2021]. Available from: http://www.eresearchjournal.com/wp-content/uploads/2020/04/0.-Impact-of-COVID.pdf
19. Mpungose C. Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic [Internet]. 2020. https://dx.doi.org/10.1057/s41599-020-00603-x.
20. de Wit M. Navigating Telerehabilitation for student training: Sharing experiences. South African Journal of Occupational Therapy. 2021;51(1):2. https://sajot.co.za/index.php/sajot/article/view/747/454
21. Toquero CM. Challenges and opportunities for higher education amid the COVID-19 pandemic: The Philippine context. Pedagogical Research. 2020;5(4). https://dx.doi.org/10.29333/pr/7947.
22. Fatonia NA, Nurkhayatic E, Nurdiawatid E, Fidziahe GP, Adhag S, Irawanh AP, Julyantoj O, Azizik E. University students online learning system during Covid-19 pandemic: Advantages, constraints and solutions. Systematic Reviews in Pharmacy. 2020;11(7):570-6. Available from: https://www.sysrevpharm.org/articles/university-students-online-learning-system-during-covid19-pandemic-advantages-constraints-and-solutions.pdf
23. Kathard H, Galvaan R, Kleintjes S. COVID-19 higher education response: how are we being equitable and inclusive? - HELTASA [Internet]. HELTASA. 2021. Available from: https://heltasa.org.za/covid-19-higher-education-response-how-are-we-being-equitable-and-inclusive/
24. Makgahlela M, Mothiba T, Mokwena J, Mphekgwana P. Measures to Enhance Student Learning and Well-Being during the COVID-19 Pandemic: Perspectives of Students from a Historically Disadvantaged University. Education Sciences. 2021;11(5):212. https://dx.doi.org/0.3390/educsci11050212.
25. Mailizar M, Almanthari A, Maulina S, Bruce S. Secondary School Mathematics Teachers' Views on E-learning Implementation Barriers during the COVID-19 Pandemic: The Case of Indonesia. Eurasia Journal of Mathematics, Science and Technology Education. 2020;16(7): 1-9. https://doi.org/10.3390/educsci11050212
26. Ptenklooster nl. Cronbach's alpha interval estimation [Internet]. 2020. Available from: https://ptenklooster.nl/sample-size-calculators/cronbachs-alpha-interval-estimation/
27. Citing R and RStudio – ORGANISING CREATIVITY [Internet]. Organizingcreativity.com. 2020. Available from: https://www.organizingcreativity.com/2020/08/citing-r-and-rstudio/
28. Farrelly P. Issues of trustworthiness, validity and reliability. British Journal of School Nursing. 2013;8(3):149-51. https://dx.doi.org/10.12968/bjsn.2013.8.3.149.
29. Welman J, Kruger F, Mitchell B, Huysamen G. Research Methodology. 3rd ed. Cape Town: Oxford University Press. 2011.
30. Rodriguez JG. Commentary: Generalisability and validity in qualitative research. British Medical Journal. 1999;319(7207):421. Available from: https://go.gale.com/ps/anonymous?id=GALE%7CA55670112&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=17592151&p=AONE&sw=w
31. Heale R, Twycross A. Validity and reliability in quantitative research. Evidence-Based Nursing. 2015;18: 66-67. https://dx.doi.org/10.1136/eb-2015-102129.
32. Saleh M, Sari R, Alim P. University Students' Perception on The Implementation of Online Learning During The Covid-19. Nazhruna: Jurnal Pendidikan Islam [Internet]. 2021;4(1):1-17. https://dx.doi.org/10.31538/nzh.v4i1.1022.
33. Copeland WE, McGinnis E, Bai Y, Adams Z, Nardone H, Devadanam V, Rettew J, Hudziak JJ. Impact of COVID-19 pandemic on college student mental health and wellness. Journal of the American Academy of Child & Adolescent Psychiatry. 2021;60(1):134-141.e2. https://dx.doi.org/10.1016/j.jaac.2020.08.466

Comparing the impact of two occupational therapy interventions on academic learning outcomes for children with Human Immunodeficiency Virus

AUTHORS
Caraleigh Otto[a,b]
https:/orcid.org/0000-0002-7162-9194
Pamela Gretschel[a]
http:/orcid.org/0000-0002-7890-3635
Elelwani Ramugondo[a]
http:/orcid.org/0000-0002-1987-4651

AFFILIATIONS
[a]Division of Occupational Therapy, Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa[b]
[b]Private Practice, Western Cape, South Africa

CORRESPONDING AUTHOR
Caraleigh Otto
caraleigh@nthandohome.co.za

KEYWORDS
HIV-positive children, Griffiths Mental Developmental Scales, Beery-Buktenica Visual Motor Integration, learning as an occupational outcome, play-informed, caregiver-implemented, home-based intervention

HOW TO CITE THIS ARTICLE
Otto C, Gretschel P, Ramugondo EL. Comparing the impact of two occupational therapy interventions on academic learning outcomes for children with Human Immunodeficiency Virus. South African Journal of Occupational Therapy. Vol 53 No2, August 2023
DOI: https:/doi.org/10.17159/2310-3833/2023/vol53n2a7

ARTICLE HISTORY
Received: July 2022
Peer review: September 2022
Revised: December 2022
Accepted: March 2023
Published: August 2023

EDITOR
Blanche Pretorius
https:/orcid.org/0000-0002-3543-0743

DATA AVAILABLITY
Upon reasonable request from the corresponding author.

FUNDING
The first author received funding from the National Research Fund, South Africa, and the University of Cape Town Postgraduate Research Funding Centre to support her completion of her postgraduate studies.

ISSN On-line 2310-3833

ABSTRACT

Introduction: The strong association between perinatal HIV infection and poor performance in academic learning is further challenged by various barriers to learning in the South African context of basic education. This study investigated the efficacy of a novel play-informed, caregiver-implemented, home-based intervention (PICIHBI) for improving academic learning in HIV-positive children.
Methodology: A single-blinded, randomised comparison group design was selected to compare PICHIBI with conventional one-on-one occupational therapy interventions. Children with HIV aged 5 to 8 years old on ART and their primary caregiver (N=23) were randomly allocated to an intervention group. The primary outcome of academic learning was measured using the Griffiths Mental Developmental Scales-Extended Revised and the short form Beery-Buktenica Visual Motor Integration test, 5th edition at baseline, mid (5 months) and post-intervention (after 10 months).
Results: At baseline, the total sample (n=23) presented with below-average performance in all assessed academic learning outcomes. Between-group differences for all academic learning outcomes were not significant at mid or post-test assessment points. A statistically significant within-group change in visual motor integration was noted in the PICIHBI from baseline to mid-test (p=.019). In the conventional group, there were statistically significant changes in visual perception from baseline to mid (p=.001) and baseline to post-test (p=.009). The sub scale Performance in the conventional group improved significantly from baseline to mid-test (p=.027).
Conclusion: While improvements were noted, children in both groups continued to present with academic learning concerns at post-test. These concerns motivate the need for continued monitoring and further investigation into the feasibility and effectiveness of occupational therapy interventions targeting the academic learning challenges of this population.

Implications for practice
This paper adds to an emerging body of evidence aiming to demonstrate the effect of occupational therapy interventions on occupational outcomes for children with perinatal HIV infection. The paper presents a detailed overview of the conceptualisation of learning as an occupational outcome. The paper further presents consideration of the practical challenges linked to the implementation of, adherence to and sustainability of rehabilitation interventions in low to middle-income countries.

INTRODUCTION AND LITERATURE REVIEW

Prevention of mother-to-child transmission programmes (PMTCT)[1] have led to the wider provision of antiretroviral therapy (ART) and, as a result, more children with Human Immunodeficiency Virus (HIV) are reaching school-going age[2]. In South Africa, an estimated 260,000 children (aged 0 to 14) live with HIV[3]. Their academic learning success is negatively impacted by delays in their motor and neuro-cognitive functioning[4,5,6,7,8].

Studies comparing the HIV-infected child's functional and intellectual abilities to

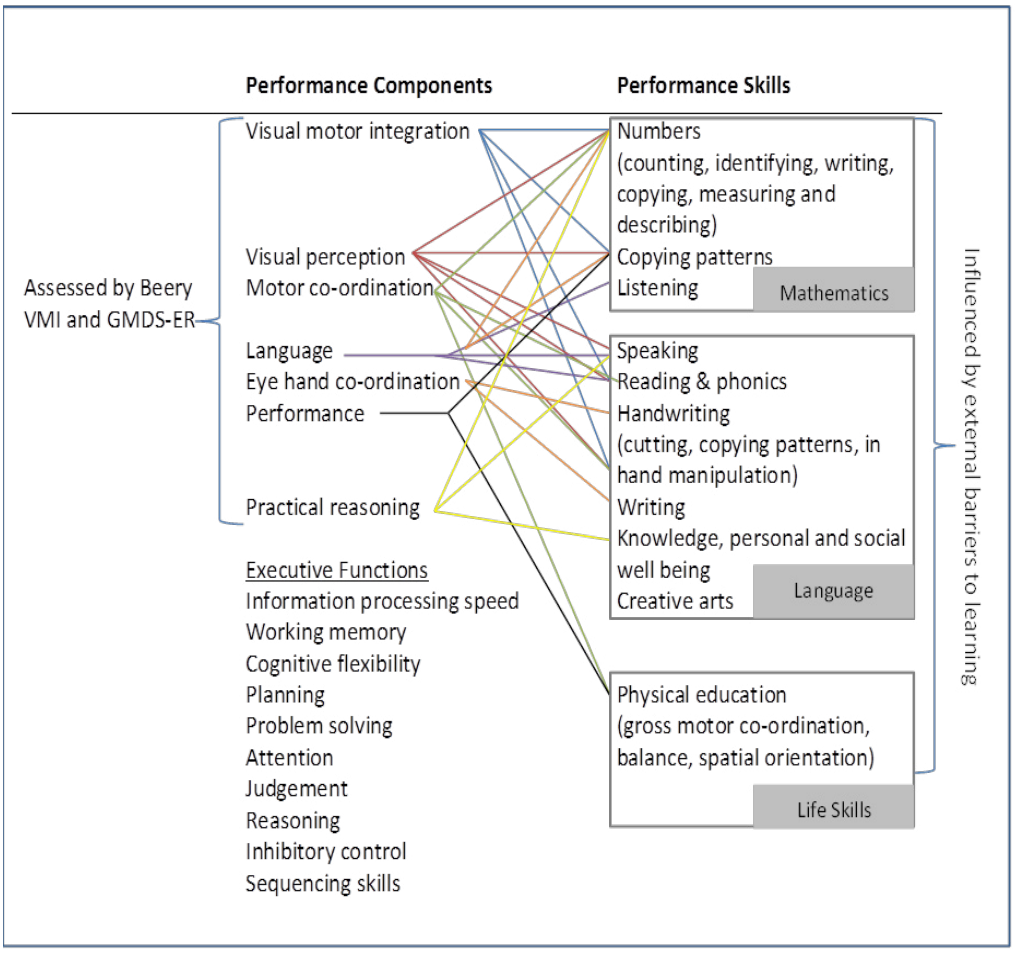


Figure 1: Conceptual map of the targeted academic learning outcomes informing the development of the content of the PICIHBI

their HIV-uninfected peers[9,10,11] support the call for children with HIV to receive intervention[12,13]. HIV is particularly prominent in low-income countries like South Africa, where its negative effect on neuro-cognition and visual perceptual skills is undoubtedly exacerbated by contextual barriers to learning[14]. Despite this, at the time of this study, only one intervention study focused on promoting developmental outcomes in an HIV-infected paediatric population in South Africa could be sourced. In this study, a home stimulation programme taught to the child's caregiver significantly improved the developmental progression of HIV positive children who were younger than 2 years and 6 months[15]. Occupational therapists promote a child's ability to engage in academic learning, often using play as a means to address barriers limiting their engagement and performance in academic learning[16]. Descriptions of, and studies exploring the effectiveness of occupational therapy interventions for HIV-positive children are scant. This paper presents the results of a postgraduate study investigating and comparing the effect of two occupational therapy interventions on the academic learning of HIV-infected children. The hypothesis for the study was that HIV-positive children on ART aged 5-8 years, taking part in the novel play-informed caregiver-implemented home-based intervention (PICHIBI), would demonstrate more improvement in their academic learning outcomes than those children receiving conventional one-on-one occupational therapy intervention. The conceptualization of academic learning outcomes to guide the development of the PICIHBI is presented in Figure 1 (above).

MATERIALS AND METHODS

Design and ethical considerations

Drawing on the CONSORT statement, a single-blinded, randomised comparison group design[17] was used to report the effectiveness of the novel PICIHBI. Ethical approval for the study was obtained from the University of Cape Town Human Research Ethics Committee (HREC/REF: 772/2014). The study was a sub-study nested in a larger study registered with the South African National Clinical Trial Registry through the National Health Research Ethics Council (Trial number: DOH-27-0115-4892). The larger study is registered with the South African National Clinical Trial Registry through the National Health Research Ethics Council (trial number: DOH-27-0115-4892).

Participants

All children aged between 5 years 0 months and 8 years 0 months and their caregivers attending the monthly outpatient paediatric anti-retroviral (ARV) clinic at Groote Schuur hospital, a tertiary hospital based in Cape Town, were considered eligible to participate in the study. Caregiver participants were those persons who spent

no less than seven hours of direct contact time a week with the child, and who were able to attend at least five out of the ten intervention sessions. All child participants lived in low-income areas and were HIV positive following vertical transmission. The clinic database consisted of 60 participants who met these criteria. A translator fluent in isiXhosa assisted in contacting the potential participants.

Sample size and power

A convenient sample of 27 dyads (caregiver and child) was arrived at to align with 90% power at a non-inferiority difference of 6 points between groups with a standard deviation of 10. This power was retained even after a 15% loss to follow-up, reducing the chance of a Type II error.

Randomisation

Using a random sequence generator, participants were assigned to treatment groups. Randomisation was completed after the participants had consented to participate and conducted their baseline assessments. All researchers and assessors were blinded to the allocation process.

Measures (Instrumentation)

A background information questionnaire completed by caregivers collected data relating to caregiver and child socio-demographics, the developmental history of the child, an overview of medical and rehabilitation interventions provided to the child up to this point, the child's ART treatment regime, and their schooling, play, and television viewing habits. Caregivers were asked to comment on their child's learning and bring copies of their school reports to provide information about their academic learning progress in the school context.

The Griffiths Mental Development Scale-Extended Revised (GMDS-ER) version for children aged 2-8 years consists of six subscales. Four of the six subscales were used in this study: language (subscale C), eye-hand coordination (subscale D), performance (subscale E) and practical reasoning (subscale F). Functional age in each subscale can be obtained through computation and developmental quotients for each subscale can be calculated by dividing the functional age of the child by their chronological age at the time of testing[18]. The GMDS-ER is used in South Africa as well as internationally and is considered to be a valid and reliable tool to use with diverse populations[2,19,20,21].

The Beery-Buktenica Developmental Test of Visual Motor Integration 5th edition (DTVMI)[22] was used to assess the child's ability to coordinate their visual perception and motor abilities. The DTVMI is frequently used in South Africa [23,24,25]. The DTVMI has high reliability and validity across a 3–18-year age range and adequate cross-cultural validity [22,26,27]. Standard scores were calculated from raw scores using USA norms.

Academic learning outcomes were represented by standardized scores with a mean quotient of 100 (15) for the GMDS-ER and a mean standard score of 100 (15) for the DTVMI. Scores between 90-109 are considered average and <70 as intellectually impaired[22,19].

Procedures

A pilot study was conducted prior to the baseline to ensure inter-rater reliability. Five assessors, all occupational therapists trained in using the GMDS-ER, assessed sixteen children from a local tertiary children's hospital. The raw scores of these assessments were correlated with the aim being to achieve a minimum level of 90% agreement. Cronbach alpha coefficients were calculated to ensure internal consistency and the coefficients all exceeded the value of 0.70, an acceptable minimum value of reliability[19]. Raw scores differed by a maximum of two to eight points between any two assessors. There was 100% agreement on the age calculations. The reliability measure between the other GMDS-ER scores (quotient, age-equivalent, z-score, percentile) varied between 0.99 and 1.

Data were collected at three intervals, baseline test (before the intervention had started), mid-test (at five months) and post-test (at ten months). The caregivers completed the background information questionnaire at baseline assessment. Data were also collected on intervention session attendance rates and participant dropout rates for both intervention groups.

The therapists and researchers met monthly throughout the intervention period for group meetings to ensure the intervention was being carried out as documented. In these spaces, the challenges and successes related to designing and implementing this intervention were discussed within the methodology of a cooperative inquiry[28].

PICIHBI group: Play informed, caregiver implemented, home-based intervention (PICIHBI)

The intervention design team drew on the National Curriculum Statements[29] to guide the determination of the specific academic learning-related skills (literacy, numeracy, gross motor, fine motor, and language) to be focused on in each of the intervention sessions. Additionally, research focused on child development and play theory guided how to make optimal use of play as a means to guide the development of the afore-mentioned academic learning skills in the intervention[30]. Both the child and the caregiver attended the monthly 90-minute PICIHBI intervention sessions. During the first 45 minutes, while the children were cared for by the clinic-appointed childminder, the caregivers engaged with the occupational therapist, and other caregivers in the group, learning how to promote their child's engagement in play, learning and development. The remaining 45 minutes were experiential. Children joined in the sessions and caregivers were guided to apply the knowledge they had learned practically using play items provided to them in each session. At the end of each session, the dyad was given the play item (for example, crayons, scissors, puzzles etc.) that was used in that session to add to their 'Go Box', a take-home tool kit consisting of age-appropriate stimulation items. Caregivers could also use play items they had at home. Each group consisted of approximately five caregiver-child dyads, an occupational therapist, and a translator/facilitator. Caregivers were encouraged to implement the weekly

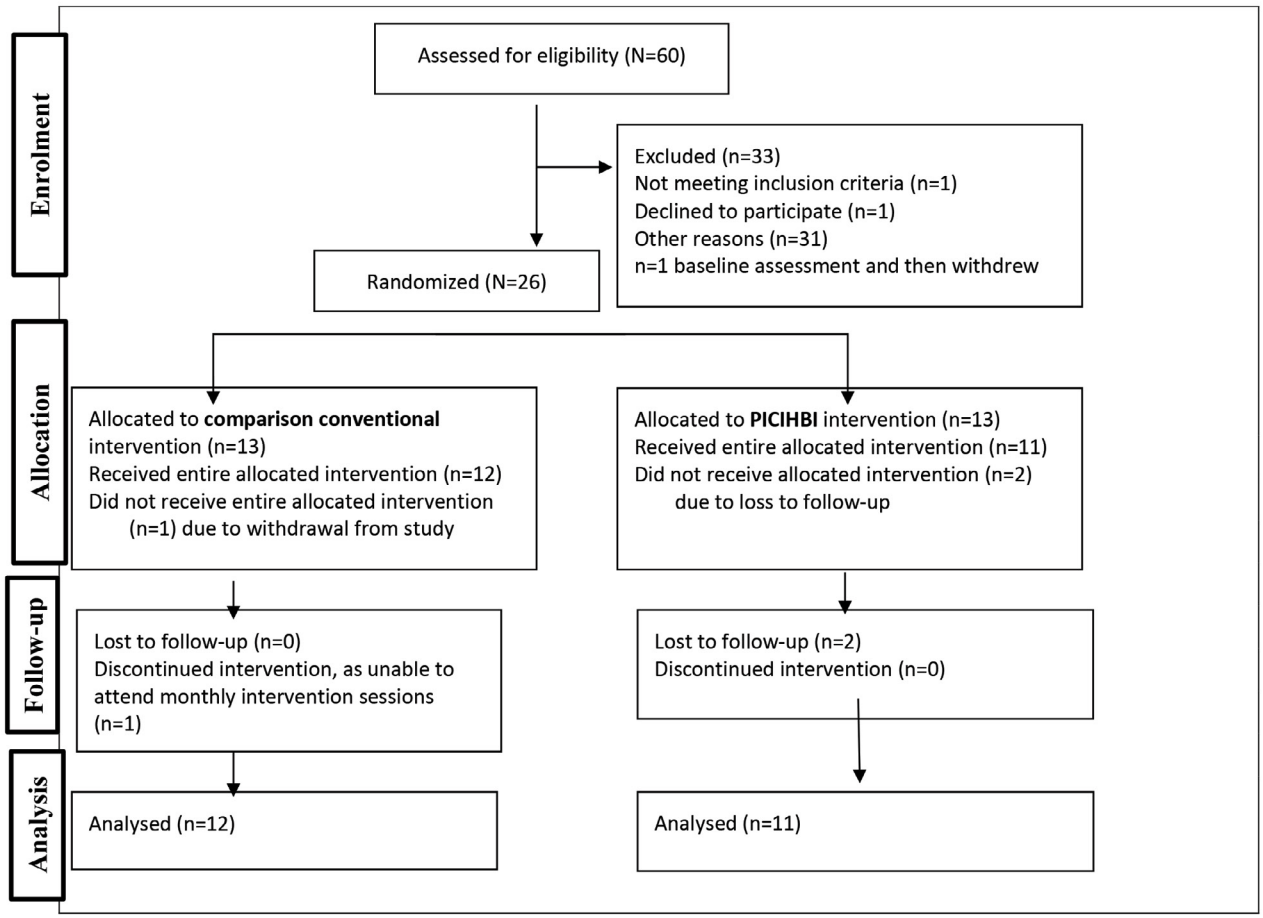


Figure 2: Participant Flowchart

group activities at home with their children. At the following group session, feedback from the caregivers was given and then documented, along with attendance, in the therapist's notes. This feedback was used to inform and build on the design of the intervention manual, which included the intervention sessions and protocols for implementing the intervention.

Comparison Group: Conventional one-on-one occupational therapy

Conventional one-on-one occupational therapy intervention was the comparison intervention. In this intervention, the child was the direct focus and although not compulsory, caregivers were welcome to sit in on and observe the sessions. Each child was offered ten 45-minute sessions. At the end of the ten sessions, once post-test had been completed, the child was issued with a 'Go Box' to take home with them.

Data collectors were blinded to the allocation of participants throughout the intervention period. Codes for each dyad were used to ensure blinding. Un-blinding occurred once all post-tests had been completed and all assessments had been scored. The participants and their caregivers were not blinded to the intervention, but to the hypothesis of the study. All assessments were administered outside intervention periods one and two.

Statistical Analysis

All data were analysed using the Statistical Package for the Social Sciences (SPSS)31 at 95% confidence interval and a significant p-value of ≤0.05. Performance below normal functional limits was rated as a score <-2 SD or <70, for both assessment tools. Univariate (descriptive), bivariate (correlations) and multivariate (regression) analyses took place. As the total sample size was less than 50, (N=23) the Shapiro-Wilk Test of Normality was used to determine the distribution of the sample. The Levene's Test for equality showed equal variances for all subscales during the test periods. Since there were no statistically significant differences between the groups using the 2-sample t-test (independent t-test), paired t-tests (dependent t-test) were conducted to determine whether any significant within-group changes had occurred. Analysis of Covariance (ANCOVA) was used where indicated, to establish which factors had the greatest relationships on variables of interest. Intention to treat (ITT) analysis was carried out in this study. The participants who did not attend all intervention sessions were still tested at post-test and their results were captured and analysed.

RESULTS

The baseline test sample size consisted of 27 dyads (n=27). One participant was transferred to a home of safety, leaving 26 participants who underwent randomisation following

Table I: Demographics for participants at baseline test (N=26)

Variable	PICIHBI group (n=13)	Conventional group (n=13)	*Total (n=26)*	*Levene's Test for equality of variances p-value*	*2-Sample t-test*
	Mean (SD)	**Mean (SD)**			*p-value*
Age (months)	76.5 (4.35)	78.6 (4.39)		0.206	0.149
Time on ART (months)	52.5 * (13.4)	67 * (9.8)		0.318	0.021
	No. (%)	***No. (%)***	***No. (%)***		
Gestation (weeks)				0.706	0.969
24-29	0 (0.0)	1 (8.3)	1 (4.3)		
30-36	1 (9.1)	1 (8.3)	2 (8.7)		
37-40	9 (81.8)	8 (66.7)	17 (73.9)		
40-41	1 (9.1)	2 (16.7)	3 (13.1)		
Total	11 (100.00)	12 (100.00)	23 (100.00)		
Gender				0.572	0.267
Male	7 (53.8)	5 (38.5)	12 (46.2)		
Female	6 (46.2)	8 (61.5)	14 (53.8)		
Total	13 (100.0)	13 (100.0)	26 (100.0)		
Caregivers				0.142	0.484
Mother	11 (84.6)	12 (92.3)	23 (88.5)		
Granny	1 (7.7)	1 (7.7)	2 (7.7)		
Aunty	1 (7.7)	0 (0.0)	1 (3.8)		
Total	13 (100.0)	13 (100.0)	26 (100.0)		
Level of primary education				**0.909**	**0.351**
Grade R	6 (46.2)	5 (38.5)	11 (42.3)		
Grade 1	7 (53.8)	7 (53.8)	14 (53.9)		
Grade 2	0 (0.0)	1 (7.7)	1 (3.8)		
Total	13 (100.0)	13 (100.0)	26 (100.0)		
Caregiver's level of education				**0.454**	**0.687**
Primary School	4 (30.8)	3 (23.1)	7 (28.0)		
High School	7 (53.8)	9 (75)	16 (64.0)		
Tertiary	2 (15.4)	0 (0.0)	2 (8.0)		
Total	13 (100.0)	12 (100.0) *	25 (100.0)		
Viral loads				**0.003**	**0.269**
LDL1 (<40)	9 (75)	10 (76.9)	19 (73.1)		
40<VL<1000	3 (25)	0 (0.0)	3 (11.5)		
1000<VL<10 000	1 (7.7)	3 (23.1)	4 (15.4)		
Total	13 (100.0)	13 (100.0)	26 (100.0)		

***Missing data: Time on ART- 2 in PICIHBI group; 4 in comparison conventional group; Caregiver level of education- 1 in comparison conventional group; Bold = statistically significant result**

baseline assessment. The small sample resulted from dyads not meeting the inclusion criteria, not wanting to participate or not being contactable for assessment dates. Two participants were lost to follow-up after the baseline test, and one was transferred to a home of care. The total sample at the end of the study was n=23. Please refer to Figure 2 (page 67).

Baseline demographics

Baseline demographics are presented in Table I (above). Mothers were the main caregivers, with the majority attaining a high school level of education. Participants in both groups generally had low viral load LDL* The independent t-test showed statistical significance for a time in which participants had been on ART (p=.021) with the comparison group being on ART longer. The Levene's Test for equality of variances was used on baseline test demographics to test if both groups had equal variances.

***The acronym LDL stands for Lower than Detectable Level. LDL is a term used to describe the amount of HIV in one's blood, i.e. one's viral load of the HI virus. The more HI virus there is in your blood, the higher ones viral load will be. http:/www.aidsmap.com/Viral-load**

Table II: Intervention attendance per child (N=23)

Child	Total amount of sessions attended	
	PICIHBI group (n=11) No. (%)	Comparison group (n=12) No. (%)
Child 1	6 (60.0)	3 (30.0)
Child 2	2 (20.0)	5 (50.0)
Child 3	1 (10.0)	7 (70.0)
Child 4	2 (20.0)	6 (60.0)
Child 5	4 (40.0)	1 (10.0)
Child 6	6 (60.0)	5 (50.0)
Child 7	8 (80.0)	6 (60.0)
Child 8	3 (30.0)	6 (60.0)
Child 9	6 (60.0)	5 (50.0)
Child 10	2 (20.0)	5 (50.0)
Child 11	2 (20.0)	1 (10.0)
Child 12		7 (70.0)

Intervention attendance

The session attendance rates varied across the intervention period with participants reporting that transport and employment factors affected their attendance at the intervention sessions. Various measures were put into place to reduce the effects of varied attendance; including reimbursing the participants for their transport costs to and from the hospital and providing the caregivers with letters to give to their employers for the days of work missed. Table II (above) shows the intervention attendance.

Aim 1: Academic learning profile of children with HIV

The academic learning profile of the total sample measured at baseline is presented below in Table III (above). The standard means of the DTVMI, and the quotient means of the GMDS-ER showed that the total sample presented with below-average scores for all academic learning outcomes measured at baseline. Standard mean and quotient mean scores below 70 indicate the presence of significant challenges. The academic learning outcomes most affected were visual perception, language, and practical reasoning.

Aim 2: Preliminary effectiveness of the PICIHBI for improving academic learning

The preliminary effectiveness of the PICIHBI for improving academic learning is represented by the presentation of Table IV and V (page 70) describing the between-group and within-group changes in both the PICIHBI and comparison conventional group for both the DTVMI and GMDS-ER.

Overall change in DTVMI scores over time

There were not statistically significant between-group differences at any time point in the intervention (p>0.05). Statistically significant within-group changes were noted. In the PICIHBI group, VMI improved from baseline to mid-test (p= .019). In the comparison conventional group, there was a statistically significant improvement in VP from baseline to mid-test (p= .001). While the mean VP standard score

Table III: Baseline standard means (DTVMI) and quotient means (GMDS-ER) for total sample (n=23 children)

Outcome measure and sub scales			
	Standard mean	Classification scale	Children scoring below 70 (%)
Developmental Test of Visual Motor Integration			
Visual motor integration*	77.9	Low	3 (13.6)
Visual perception*	74.0	Low	9 (40.9)
Motor coordination	86.3	Below Average	3 (13.0)
	Quotient mean	Classification scale	Children scoring below 70 (%)
Griffiths Mental Developmental Scales-Extended and Revised			
Language	71.6	Borderline delay	16 (69.6)
Eye-hand coordination	80.2	Low average	13 (56.5)
Performance	81.6	Low average	7 (30.4)
Practical Reasoning	75.4	Borderline delay	18 (78.3)
General Quotient	80.3	Low average	15 (68.2)

***Missing data: one child from comparison conventional group missed baseline assessment for these subscales (n=22 children**

decreased from mid-test to post-test (88.7), the overall change in VP from baseline to post-test remained significant (p= .009). The only decrease in mean standard scores from baseline to post-test was seen in the PICIHBI group for motor co-ordination. In the other subtests, both groups improved throughout the intervention period. These changes were not statistically significant. None of the children in the PICIHBI scored <70 (severe delay) at post-test.

Overall change in GMDS-ER scores over time

No statistically significant between-group differences were found for any of the GMDS-ER outcomes at any time point (p>0.05). One within-group change was noted. A statistically significant improvement in performance was observed for the conventional group from baseline to mid-test (p=.027). While not statistically significant, changes were noted within the two groups. Except for language and practical reasoning in the conventional group, all post-test assessment scores were higher than the baseline assessment scores in both groups. Scores generally improved from baseline to mid-test except for eye-hand coordination in the PICIHBI group and language, practical reasoning, and general quotient in the comparison conventional group. Eye-hand coordination and general quotient improved at post-test and were higher than the baseline assessment, while language and practical

Table IV: Changes in Beery VMI subtests mean standard scores in both groups over time (N=23)

	Baseline		Mid-point		Post-test	
Visual Motor Integration (VMI)	mean	SD	mean	SD	mean	SD
PICIHBI group	81.0	15.86	90.3	8.39	87.5*	10.10
Comparison group	81.8^	13.90	85.1	13.55	84.3	10.36
Between group differences at each point	p-value	(95% CI)	p-value	(95% CI)	p-value	(95% CI)
	0.899	-14.1-12.4	0.287	-4.7-15.1	0.503	-6.4-12.5
Visual perception (VP)	mean	SD	mean	SD	mean	SD
PICIHBI group	85.1	26.15	90	18.50	96.1	12.06
Comparison group	69.9^	15.41	94.1	17.42	88.7	18.80
Between group differences at each point	p-value	(95% CI)	p-value	(95% CI)	p-value	(95% CI)
	0.107	-3.6-34.5	0.591	-19.7-11.5	0.277	-6.4-21.3
Motor co-ordination (MC)	mean	SD	mean	SD	mean	SD
PICIHBI group	91.1	10.55	91.5	8.41	90.9	9.57
Comparison group	81.8	13.24	83.8	12.83	83.8	8.23
Between group differences at each point	p-value	(95% CI)	p-value	(95% CI)	p-value	(95% CI)
	0.079	-1.2-19.87	0.110	-1.9-17.1	0.07	-0.6-14.8

Missing data:

***Two children from the PICIHBI group for VMI at post-test (n=9)**

^One child from the comparison conventional group for VMI and VP at baseline (n=11)

Table V: Changes in GMDS-ER mean quotient scores for both groups over time (N=23)

GMDS-ER subscale	Quotient Mean (SD)			Number of children with z-score below -2 (%)	
Group	Baseline	Mid	Post	Baseline	Post
PICIHBI (n=11)					
Language	70 (10.27)	76.6 (10.18)	74.4 (7.71)	8 (72.7%)	6 (54.5%)
Eye-hand co-ordination	82.3 (15.74)	80.2 (8.22)	84.8 (7.71)	6 (54.5%)	1 (9.1%)
Performance	86.5 (23.10)	90.7^ (21.23)	87.1 (18.97)	2 (18.2%)	1 (9.1%)
Practical reasoning	75.1 (10.1)	75.3 (7.05)	78.6 (11.77)	8 (72.2%)	6 (54.5%)
General Quotient*	80.3 (9.76)	83.3 (7.51)	86.1 (11.86)	7 (63.6%)	3 (30.0%)*
Comparison conventional (n=12)					
Language	73.2 (10.75)	68.4 (12.90)	69.6 (10.17)	8 (66.7%)	6 (50.0%)
Eye-hand co-ordination	78.4 (11.53)	80.5 (16.63)	79.9 (10.17)	6 (50.0%)	3 (25.5%)
Performance	77.1 (21.84)	90.1 (19.95)	85.8 (17.86)	5 (41.7%)	2 (16.7%)
Practical reasoning	75.7 (8.36)	72.1 (10.64)	72.7 (11.49)	10(83.3%)	9 (75.0%)
General Quotient	80.3 (11.14)	79.8 (14.19)	89.7 (13.31)	8 (66.7%)	5(41.7%)

***Missing data: One child from the PICIHBI group GQ, at post-test (n=10)**

^Statistically significant change (p>0.005)

reasoning continued to decline, and post-test scores were lower than baseline.

Aim 3: Grade progression

The third objective was to track the grade progression of the children in each group. Only one child in the comparison conventional group repeated a grade, grade one, the second year of formal schooling in South Africa.

Adverse Effects

No adverse effects were noted or documented.

DISCUSSION

At the time, this study was novel in its exploration of the impact of an occupational therapy intervention on the academic learning outcomes of the HIV-infected child

on ART. Baseline results showed that the total sample all performed below average on all academic learning outcomes as measured by the DTVMI and the GMDS-ER. The academic learning outcomes most affected were visual perception, language, and practical reasoning. For visual perception, 40.9% of the total sample scored <70 at baseline. The high percentage of children experiencing difficulties with visual perception correlates with the results of a study by Laughton *et al* [32] showing the negative impact of HIV on visual perception, regardless of the ART regime provided. Visual perceptual difficulties are a concern as a visual learning approach is dominant in many school environments[33]. For practical reasoning and language, 78.3% and 69.6% respectively of the children scored <-2 z-scores, which was also consistent with prior studies describing neurodevelopment in HIV children [2, 7, 11,21].

Between-group analysis showed that there were no statistically significant differences in the performance of the groups at all measurement points for all academic learning outcomes. This showed that PICIHBI had equivalent effects on the academic learning outcomes for HIV-positive children aged 5 – 8 years, on ART and living in low SES families, when compared to the comparison conventional group.

Within-group analysis showed some statistically significant results. PICHIBI was significantly more effective (p=.019) in improving visual motor integration over a five-month intervention period, from baseline to mid-test. The positive change in a group format intervention over a five-month period is encouraging as well-developed visual motor integration skills have been linked to the development of effective handwriting in children[34] and high levels of academic performance[25]. The conventional intervention was significantly beneficial in improving visual perception over a five- and ten-month intervention period, which could possibly be linked to the more intensive focus placed on specific visual perceptual skills within the format of the individual conventional intervention approach. A statistically significant improvement in performance was observed for the comparison conventional group (p=.027) from baseline to mid test. While there were decreases and increases in other academic learning outcomes, between assessment points for each group, none of these changes was statistically significant which supports specific time points were not more viable to effect changes in these outcomes. While there was a decrease in the number of children scoring <70 seen from baseline to post-test in both groups, children continued to present with difficulties in academic learning outcomes at post-test.

Limitations

A small sample size (n=23) resulted in wider confidence intervals affecting the generalizability of the results. No follow-up assessments were conducted, and this limited the researcher's discernment if the improvements or digression in scores in the various academic learning outcomes, were purely due to intervention or in addition to the natural maturation of a child over time. Not all variances measured in the two groups were equal and this may have affected a Type I error rate. Attaining participants' recent school reports would have allowed for further comparisons to be made between academic learning outcomes assessed in the intervention, and the child's engagement and performance in academic learning in the context of the school classroom.

CONCLUSION

This article highlighted the delays in various academic learning outcomes of HIV-positive children which will assist in informing occupational therapy practice protocols, policies, and legislations, relating to academic learning for children with HIV on ART in South Africa. Delays in the areas of language and practical reasoning should urge occupational therapists to partner with communication science therapists and educational specialists to design interventions which support the academic progress of children with HIV living in the multi-lingual context of South Africa. Rehabilitation in South Africa continues to be undermined by staffing constraints limiting access to services. The group format of the PICIHBI holds the potential to have a greater reach when compared to conventional one-on-one intervention[35]. Attendance was however problematic with a slightly higher level of attendance in the comparison control group. Further investigation into the feasibility and effect of PICHBI within a larger multi-site study, drawing on mechanisms to build on attendance, is thus recommended.

Lessons learnt

During the process of planning and implementing the RCT, the following lessons were learnt:

- Diligent reporting of all aspects of the process of the study must take place in line with the CONSORT statement[17] to ensure all decisions made and actions taken, are documented.
- Although the RCT took place in a central site which participants were already accessing for other health services, regular attendance was still a challenge. Researchers planning RCTs need to consider the existing health, employment and personal schedules of participants when planning sessions and factor in reimbursement for travel to and from appointments, to encourage more regular attendance.
- Researchers planning RCTs should plan to conduct post trial follow up assessments to monitor the sustained impact of the interventions.

Conflicts of interest

The Authors declare that there is no conflict of interest.

Author contributions

Caraleigh Otto: Conceptualization, Methodology, Investigation, Original draft preparation, Writing-Reviewing and Editing. Pam Gretschel: Conceptualization, Methodology, Writing-Reviewing and Editing, Visualization, Supervision, Project administration. Elelwani Ramugondo: Conceptualization, Methodology, Writing-Reviewing and Editing, Supervision, Project administration

REFERENCES

1. Department of Health: National Consolidated Guidelines for the Prevention of Mother-to-Child Transmission of HIV (PMTCT) and the Management of HIV in Children, Adolescents and Adults. 2015. [accessed 2022 June 22]. doi:https:/www.knowledgehub.org.za/system/files/elibdownloads/2019-07/National%2520consolidated%2520guidelines%25202015.pdf
2. Potterton J, Hilburn N, Strehlau R. Developmental status of preschool children receiving cART: a descriptive cohort study. Child: Care, Health and Development. 2016; 42(3):410–414. doi: http:/dx.doi.org/10.1111/cch.12321
3. Aids info: People living with HIV receiving ART. [accessed 2020 June 15]. Available from: https:/aidsinfo.unaids.org/
4. Chinembiri, B.; Wei, C.; Ming, Z.; Kai, S. A Comparison of the Visual Perceptual Processing Skills of Children (6-10 Years Old) with and without Human Immuno-Deficiency Virus (HIV) Using the Test of Visual Perceptual Skills-3rd Edition (TVPS-3) in Harare, Zimbabwe. Preprints. 2018. doi:https:/www.preprints.org/manuscript/201808.0462/v1
5. Knox J, Arpadi SM, Kauchali S, Craib M, Kvalsvig JD, Taylor M, et al. Screening for developmental disabilities in HIV positive and HIV negative children in South Africa: Results from the Asenze Study. PLOS ONE. 2018; 13(7):e0199860. doi:https:/doi.org/10.1371/journal.pone.0199860
6. Laughton B, Cornell M, Boivin M, Van Rie A. Neurodevelopment in perinatally HIV-infected children: a concern for adolescence. Journal of the International AIDS Society. 2013;16(1). doi:http:/dx.doi.org/10.7448/ias.16.1.18603
7. Puthanakit T, Ananworanich J, Vonthanak S, Kosalaraksa P, Hansudewechakul R, van der Lugt J, et al. Cognitive Function and Neurodevelopmental Outcomes in HIV-infected Children Older Than 1 Year of Age Randomized to Early Versus Deferred Antiretroviral Therapy. Pediatric Infectious Disease Journal. 2013; 32(5):501–508. doi:http:/dx.doi.org/10.1097/inf.0b013e31827fb19d
8. Odejayi R, Franzsen D, De Witt P. Visual motor integration delay in preschool children infected with HIV. South African Journal of Occupational Therapy. 2019;49(3):24–30. doi:http:/dx.doi.org/10.17159/2310-3833/2019/vol49n3a5
9. Boyede G, Lesi, Ezeaka C, Umeh. Impact of sociodemographic factors on cognitive function in school-aged HIV-infected Nigerian children. HIV/AIDS - Research and Palliative Care. 2013; 145. doi:http:/dx.doi.org/10.2147/hiv.s43260
10. Cohen S, ter Stege JA, Geurtsen GJ, Scherpbier HJ, Kuijpers TW, Reiss P, et al. Poorer cognitive performance in perinatally HIV-infected children versus healthy socioeconomically matched controls. Clinical Infectious Diseases. 2014; 60(7):1111–1119. doi: http:/dx.doi.org/10.1093/cid/ciu1144
11. Frolek Clark GJ, Schlabach TL. Systematic Review of Occupational Therapy Interventions to Improve Cognitive Development in Children Ages Birth–5 Years. The American Journal of Occupational Therapy.2013; 67(4):425–3. doi: http:/dx.doi.org/10.5014/ajot.2013.006163
12. Linn K, Fay A, Meddles K, Isbell S, Lin PN, Thair C, et al. HIV-Related Cognitive Impairment of Orphans in Myanmar With Vertically Transmitted HIV Taking Antiretroviral Therapy. Pediatric Neurology. 2015; 53(6):485–490. doi: http:/dx.doi.org/10.1016/j.pediatrneurol.2015.08.004
13. Guo Y, Li X, & Sherr L. The impact of HIV / AIDS on children's educational outcome: A critical review of global literature. AIDS Care. 2012; 24(8): 993–1012. doi: https:/doi.org/10.1080/09540121.2012.668170
14. Donald KA, Walker KG, Kilborn T, Carrara H, Langerak NG, Eley B, et al. HIV Encephalopathy: pediatric case series description and insights from the clinic coalface. AIDS Research and Therapy. 2015;12(1): 2. doi:http:/dx.doi.org/10.1186/s12981-014-0042-7
15. Potterton, J., Steward, A., Cooper, P., Becker, P. The effect of a basic home stimulation programme on the development of young children infected with HIV. Developmental Medicine & Child Neurology. 2009; 52(6):547–551. doi: http:/dx.doi.org/10.1111/j.1469-8749.2009.03534.x
16. Dankert HL, Davies PL, Gavin WJ. Occupational Therapy Effects on Visual-Motor Skills in Preschool Children. The American Journal of Occupational Therapy. 2003; 7(5):542–549. doi: http:/dx.doi.org/10.5014/ajot.57.5.542
17. Schulz KF, Altman DG, Moher D. CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. Trials. 2010;11(1). doi: http:/dx.doi.org/10.1186/1745-6215-11-32
18. Reyes A, Pacifico R, Benitez B, Villanueva-Uy E, Lam H, Ostrea Jr EM. Use of the Griffiths Mental Development Scales in an agro-industrial province in the Philippines. Child: Care, Health and Development. 2010; 36(3):354–360. doi: http:/dx.doi.org/10.1111/j.1365-2214.2010.01080.x
19. Luiz DM, Foxcroft CD, Stewart R. The construct validity of the Griffiths Scales of Mental Development. Child: Care, Health and Development. 2001; 27(1):73–83. doi: http:/dx.doi.org/10.1046/j.1365-2214.2001.00158.x
20. Laughton B, Springer PE, Grove D, Seedat S, Cornell M, Kidd M et al. Longitudinal developmental profile of children from low socio-economic circumstances in Cape Town, using the 1996 Griffiths Mental Development Scales. South African Journal of Child Health. 2010; 4(1), 106-111. PMID:22984637; PMCID:PMC3439644.
21. Lowick S, Sawry S, Meyers T. Neurodevelopmental delay among HIV-infectedpreschool children receiving antiretroviral therapy and healthy preschool children in Soweto, South Africa. Psychology, Health & Medicine. 2012; (5):599–610.doi: http:/dx.doi.org/10.1080/13548506.2011.648201
22. Beery KE & Beery NA. The Beery-Buktenica Developmental Test of Visual-Motor Integration with supplementary developmental tests of Visual perception and Motor coordination Administration, scoring and teaching manual (5th ed.). 2004. Minneapolis, MN: NCS Pearson, Inc.
23. Dunn M, Loxton H, Naidoo A. Correlations of Scores on the Developmental Test of Visual-Motor Integration and Copying Test in a South African Multi-Ethnic Preschool Sample. Perceptual and Motor Skills. 2006; 103(3):951–958. doi: http:/dx.doi.org/10.2466/pms.103.3.951-958
24. Lotz L, Loxton H, Naidoo AV. Visual-motor integration functioning in a South African middle childhood sample. Journal of Child & Adolescent Mental Health. 2005; 17(2):63–67. doi: http:/dx.doi.org/10.2989/17280580509486602
25. Pienaar AE, Barhorst R, Twisk JWR. Relationships between academic performance, SES school type and perceptual-

motor skills in first grade South African learners:NW-CHILD study. Child: Care, Health and Development. 2013;40(3):370–378. doi: http:/dx.doi.org/10.1111/cch.12059
26. Beery KE (1997). The Beery-Buktenica Developmental Test of Visual-motor integration with Supplemental Developmental tests of visual perception and motor co-ordination Administration, Scoring and teaching manual (4th ed.). New Jersey: Modern Curriculum Press, Parsippany.
27. van Jaarsveld A, Vermaak M, van Rooyen C. The developmental status of street children in Potchefstroom, South Africa. South African Journal of Occupational Therapy. 2011; 41(1): 5-8. Available from: http:/www.scielo.org.za/scielo.php?script=sci_arttext&pid=S2310-38332011000100003&lng=en.
28. Gretschel P, Ramugondo EL, Galvaan R. An introduction to Cultural Historical Activity Theory as a theoretical lens for understanding how occupational therapists design interventions for persons living in low-income conditions in South Africa. South African Journal of Occupational Therapy. 2015; 45(1): 51-55. doi: http:/dx.doi.org/10.17159/2310-3833/2015/v45no1a9.
29. Department of Education. Curriculum and Assessment Policy Statements (CAPS). Pretoria, South Africa. 2011. [accessed 2022 October 06]. https:/www.education.gov.za/Curriculum/CurriculumAssessmentPolicyStatements(CAPS).aspx
30. Case-Smith J, Richardson P & Schultz-Krohn W. An overview of occupational therapy for children. In J. Case-Smith (Eds.) 5th edition, Occupational therapy for children (pp. 2-29). Philadelphia: Elsevier Mosby.
31. IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corporation.
32. Laughton B, Cornell M, Kidd M, Springer PE, Dobbels EFM, Rensburg AJV, et al. Five year neurodevelopment outcomes of perinatally HIV-infected children on early limited or deferred continuous antiretroviral therapy. Journal of the International AIDS Society. 2018; 21(5). doi: http:/dx.doi.org/10.1002/jia2.25106
33. Schneck, C. Visual Perception. In: Case-Smith. J. Occupational Therapy for children (5th ed.). Missouri, USA: Elsevier, Mosby. 2005; 412-448.
34. Volman MJM, van Schendel BM, Jongmans MJ. Handwriting Difficulties in Primary School Children: A Search for Underlying Mechanisms. The American Journal of Occupational Therapy.2006; 60(4):451–60. doi: http:/dx.doi.org/10.5014/ajot.60.4.451
35. Morris LD, Grimmer KA, Twizeyemariya A, Coetzee M, Leibbrandt DC, Louw QA. Health system challenges affecting rehabilitation services in South Africa. Disability and Rehabilitation. 2019; 43(6):877–83. doi: http:/dx.doi.org/10.1080/09638288.2019.1641851

Integrated knowledge-translation in occupational therapists working with high-risk infants in South Africa: An explorative qualitative inquiry

AUTHORS

Ayesha Dawood[a]
https://orcid.org/0000-0002-3316-5907
Pragashnie Govender[b]
https://orcid.org/0000-0003-3155-3743
Samantha J York[c]
https://orcid.org/0000-0002-6535-3662
Gina Rencken[b]
https://orcid.org/0000-0002-3658-4453
Michael O Ogunlana[b,d]
https://orcid.org/0000-0001-6877-6938

AFFILIATIONS

[a] Occupational Therapy, King Dinizulu Hospital Complex, Department of Health, KwaZulu-Natal, South Africa
[b] Discipline of Occupational Therapy, School of Health Sciences, University of KwaZulu Natal, South Africa
[c] Occupational Therapy Private Practice, KwaZulu-Natal, South Africa
[d] Assistant Director: Physiotherapy Services, Federal Medical Centre Abeokuta, Nigeria.

CORRESPONDING AUTHOR

Pragashnie Govender
naidoopg@ukzn.ac.za

KEYWORDS

neonatal care, evidence-based practice, knowledge utilisation, early intervention, neurodevelopmental supportive care

HOW TO CITE THIS ARTICLE

Dawood A, Govender P, York SJ, Rencken G, Ogunlana, MO. Integrated knowledge-translation in OTs working with high-risk infants in South Africa: An Explorative Qualitative Inquiry. South African Journal of Occupational Therapy. Vol 53 No2, August 2023.
DOI: https://doi.org/10.17159/2310-3833/2023/vol53n2a8

ARTICLE HISTORY

Received: September 2021
Peer review: March2022
Revised: May 2022
Accepted: September 2022
Published: August 2023

EDITOR

Janine van der Linde
https://orcid.org/0000-0003-1067-9494

DATA AVAILABLITY

Upon reasonable request from the corresponding author.

FUNDING

The principal investigator, Pragashnie Govender, of the larger study, from which this knowledge claim emanates, received support from the National Research Foundation (NRF) of South Africa via the Research Development Grants for Y-Rated Researchers Funding instrument, Grant Number 120400 (Reference: CSRP190423432325).

ISSN On-line 2310-3833

ABSTRACT

Background: This qualitative study explored the knowledge to practice gaps of occupational therapists who have a vital role in neurodevelopmental supportive care for high-risk infants.
Methods: Via purposive sampling, 17 therapists working in public health in South Africa were recruited to participate in virtual focus groups. Data were thematically analysed using a hybrid approach.
Findings: Five themes emerged, which included (i) occupational therapy and neonatal care in the public health sector, (ii) knowledge acquisition and knowledge synthesis, (iii) knowledge translation and utilisation, (iv) contextual barriers and adaptation and (v) the ideal occupational therapist in the ideal neonatal setting. Facilitators, inhibitors, referrals, and interest in occupational therapy neonatal care were also highlighted.
Conclusions: Knowledge to practice gaps in occupational therapy include insufficient training, a decreased interest in neonatal care, staff shortages, multi-disciplinary team rotations and a reduced understanding of the professional role and scope of occupational therapy. Resources, training, and policy development appear to be necessary to inform a standard of care.

Implication for practice

The role of the occupational therapist in supporting high risk infants is generally limited and remains somewhat unknown in current South African contexts.
It is essential to identify knowledge-to-practice gaps for occupational therapists supporting high-risk infants in the public health sector for successful implementation of neurodevelopmental supportive care.

By the exploration of practitioner opinions and insight through appreciating the role of the occupational therapist in managing high risk infants, contextually specific and relevant knowledge translation interventions may be developed and implemented which have implications for evidence-based practice and more successful outcomes in the high-risk infant.

INTRODUCTION

Goal three of the Sustainable Development Goals (SDG) aims to decrease neonatal mortality rates by 1.2% in 1000 births and reduce mortality in children below five years before and until 2030[1]. Whereas child mortality rates have shown a decline over the past 20 years, there is a need to emphasise child morbidity. The results of preterm birth complications and other neonatal risk factors at birth may lead to a neurological injury resulting in long-term cognitive, sensory, and motor impairments in infants[2]. There is a paucity of literature on morbidity rates, and the resultant impairment following neurological insults post preterm and at full-term births in low and middle-income countries (LMICs). However, 98% of neonatal morbidity occurs in underprivileged countries[3]. Morbidity forms part of the occupational therapy scope of practice. Early recognition of neurodevelopmental disorders and the care of the developing brain through neurodevelopmental supportive care (NDSC) should thus be implemented in neonatal intensive care units (NICU) to reduce the severity of morbidity.

There has been a surge of evidence relating to knowledge translation (KT) in the past ten years, with stakeholders concurring that knowledge requires translation into action. A scoping review highlighted limited studies indicating the benefits and results of KT strategies and decreased practical research on integrating KT[4]. Notwithstanding this, a recent study in South Africa (SA) utilised implementation research to investigate the current practices of NDSC amongst the multi-disciplinary team (MDT) who service the NICU in two public hospitals in the province of Gauteng[5]. Hardy and colleagues investigated community service occupational therapists experiences working in the NICU in KwaZulu-Natal (KZN), South Africa[6]. Anecdotal evidence has identified a gap within the South African context in determining how permanently employed occupational therapists working in the NICU/high care units integrate their clinical experiences with evidence-based practice (EBP) in the care of the high-risk infant. There is evidence to suggest a lack of research utilisation by occupational therapists who work in the NICU in the South African public health sector, with many therapists utilising various sources that may not be evidence-based or are outdated[6]. The exploration and use of KT in developing and determining occupational therapists' skills in utilising EBP have been identified in previous studies in developed countries[7]. However, to the authors' best knowledge, it has not been explored with occupational therapists who support high-risk infants in the public health sector of KZN[8].

The occupational therapist working in the NICU must have expert training in NDSC to plan inclusive intervention, evaluation, and discharge planning of the neonate, provide education to staff and families, and make fast, efficient, and effective decisions[8–11]. A recent study has discovered that occupational therapists found it challenging to establish their roles within the NICU; therapists felt that they did not have the adequate skills and knowledge to work in the stressful NICU environment. The hardships experienced in the public health sector, especially with the high infant and child mortality and morbidity rates, indicate the need to translate EBP into practice[12–13]. Therefore, the current clinical standards of care must be determined before EBP can be applied[14]. This study aims to discover the existing knowledge to practice gaps and visualise the ideal knowledge to practice interventions for occupational therapists. They support high-risk infants by exploring occupational therapists' perceptions of working in neonatal care in the public health sector of KZN.

Literature Review

There is a limited understanding of the NDSC approach for high-risk infants[15]. Sensory development during the perinatal period is a susceptible phase that occurs in a particular order, with each system maturing in its course[16]. Implementation of NDSC in NICU's and high care settings during this period will have lasting consequences on a neonate's perceptual and behavioural development. One of the cited reasons for high neonatal mortality rates were attributed to a poorly skilled MDT[17]. Other studies have deduced that the clinical outcomes of implementing NDSC during an infant's stay in the NICU result in; reduced morbidity in the initial four weeks of being admitted, a decreased amount of time in the NICU, and a significant improvement in neurobehavioral functioning on discharge[18]. Over the last decade, there has been a shift from prioritising survival to reducing the consequences of morbidity to ensure an enhanced quality of life[19]. Presently there is a paucity in the SA literature investigating the quality of care and the interventions sourced and utilised by the MDT with high-risk infants in the NICU[20]. In the public health sector of KZN, the number of occupational therapists has decreased to 45%, with many institutions managed by junior occupational therapists[21]. For new therapists, the NICU, is an intimidating environment to be working in without supervision[6,22]. Hardy *et al.*[8], in their study, discovered that occupational therapists found it challenging to establish their roles within the NICU; therapists also felt that they did not have the adequate skills and knowledge to work in the stressful NICU environment.

As EBP expands, studies indicate that results from research are not implemented into the occupational therapy scope of practice[22–23]. The use of standardised assessments inpatient care by therapists is scarce[24], with many occupational therapy interventions not being evidence-based. Therapists display decreased skills, knowledge, and confidence to apply scientific evidence into their daily practice. Therapists generally have a negative perception of research and receive inadequate administration assistance in their work areas, thus less time to engage with scientific evidence[23,25].

Studies have shown that EBP allowed for minimum exploration in clinical practice whilst others viewed EBP as a positive when utilised simultaneously with current occupational therapy clinical practices[26]. Therapist recognised years of experience in clinical practice as a critical part of their knowledge, decision-making abilities, skills and evidence in everyday practice[25–26]. Many therapists engaged with senior therapists or colleagues who have more experience in the field, attended journal clubs and referred to textbooks[27]. Therapists who have had postgraduate training display confidence in clinical practice and utilise research findings inpatient interventions. These outcomes are aligned with research in the field of KT. It is suggested that KT interventions include cognitive learning theories to allow therapists to develop their knowledge in EBP and detect gaps in their clinical knowledge[28]. Studies investigating the effectiveness of KT interventions in occupational therapy have found that focusing on inhibitors that prevent EBP may show positive results in increasing knowledge, self-worth and changing clinical practice behaviours[7]. A crucial step suggested in studies producing KT interventions for occupational therapists is to be aware of the inhibitors and enablers of the clinician and the clinical context. Four concepts have been identified to evaluate the success of KT interventions in influencing changes in clinical practice namely; the elements that the intervention consists of, the personal attributes of the therapist, aspects of the conduct that the KT intervention is attempting to modify, and features of the health context in which the therapist practices[29]. KT interventions need to correspond with a therapists clinical context, preferred learning methods and personality traits[30]. Generally, occupational therapists believe that EBP includes research and clinical experience and designing

Table I: Sample Demographics (n=17)

OT	Gender	Years of experience in clinical practice	Level of care in the public health sector	KZN District	Tertiary institution in which undergraduate training was completed?	Any additional training (neonates/ high risk infants)	Little Steps Neurodevelopmental Supportive Care of the Preterm Infant	NDT Paediatrics/ Advanced Baby Course	WHO Infant and Young Child Feeding	Infant Sensory Integration	Other workshops
1	F	10–15	District	Umkhanyakude	UP	Yes		X			
2	F	>15	Tertiary	Umgungundlovu	UKZN	Yes	X				X
3	F	5–10	District	Ethekwini	UKZN	Yes	X				X
4	F	>15	Regional	Ethekwini	UKZN	No					
5	F	5–10	Tertiary	Ethekwini	UKZN	Yes	X	X			
6	F	5–10	Regional District	Ethekwini	UKZN	Yes					X
7	F	10–15	Regional District	Ethekwini	UKZN	Yes					X
8	F	5–10	Regional District	Ilembe	UCT	Yes	X		X	X	X
9	F	2–5	District	Ilembe	UKZN	Yes					X
10	F	2–5	Regional District	Ethekwini	UWC	No					
11	F	2–5	District	Umgungundlovu	UKZN	No					
12	F	5–10	District	Harry Gwala	UKZN	Yes		X			X
13	F	5–10	Tertiary	Umgungundlovu	UKZN	Yes					X
14	F	2–5	District	Zululand	UCT	No					
15	M	2–5	District	Harry Gwala	UKZN	No					
16	F	>15	District	Umkhanyakude	US	Yes		X			
17	F	5–10	Regional	Ethekwini	UKZN	No					

UCT-University of Cape Town; UKZN-University of KwaZulu-Natal; UP-University of Pretoria; US-University of Stellenbosch; UWC-University of Western Cape

patient-specific interventions[26]. The results and continuous evaluation of KT in occupational therapy need exploration to enhance knowledge and skills in using EBP in clinical settings.

MATERIAL AND METHODS

This study is reported according to the Consolidated Criteria for Reporting Qualitative Research (COREQ)[31].

Methodological Orientation and Theory

This research formed part of a larger study aiming to identify and bridge the knowledge-to-practice gaps with rehabilitation therapists who work with high-risk infants in the public health sector of South Africa[32]. This particular study was a qualitative exploration of occupational therapists' experiences in the public health sector of KZN who share similar ethnography or characteristics, guided by an appreciative inquiry (AI) approach[33] and KT process[28]. AI encompasses four phases: discovery, dream, design, and destiny[33]. The first two phases of the AI approach were used and aligned with KT principles, such as knowledge inquiry, knowledge synthesis, sustaining knowledge, and knowledge utilisation in the care of the high-risk infant[31]. This promoted a discussion amongst occupational therapists about how they acquire knowledge to intervene in the NICU/high care units, support the high-risk infant, and synthesise and sustain the information they source, utilise, and adapt to their contextual needs (Figure 1 page 77).

Recruitment and Sampling

Using purposive non-probability sampling[33, 17] participants were recruited into the study. Informed consent and demographic information forms were sent to potential participants who were informed on voluntary participation and confidentiality. Therapists had to meet criteria that

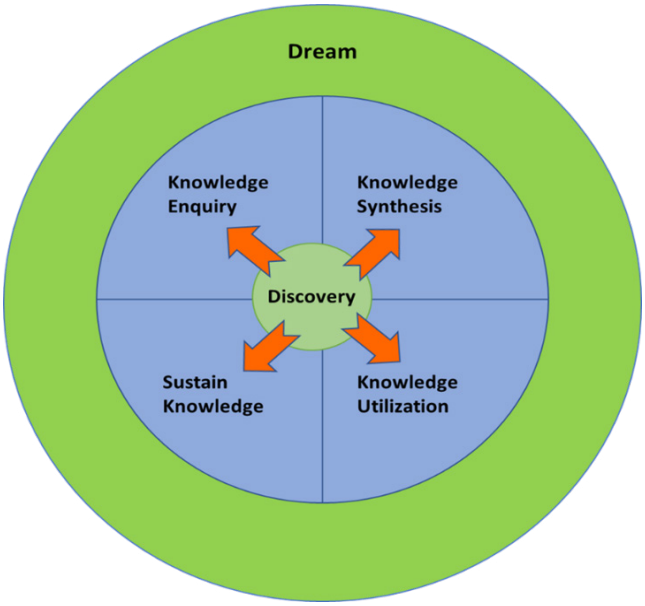


Figure 1: Theoretical framework and methodological orientation of the study.

included permanent employment for more than two years and having worked with neonates and high-risk infants in various levels of care in public health institutions across the province of KZN SA.

Sample Demographics

Of the 17 participants, 70.6% (n=12) completed their undergraduate training at the same institution. The majority were female (94%; n=16) and had up to ten years of experience (70,6%; n=12). The practice setting involved therapists mainly from the district level (59%; n=10), with a large percentage having had prior neonatal training (65%; n=11) (Table I page 76 refers).

Setting

Upon the South African government's decision to initiate a nationwide lockdown due to the Coronavirus (COVID 19) pandemic globally, alternate methods for qualitative data collection due to social distancing guidelines were sought[33]. Two focus groups via the online platform ZOOM were used to collect data in this study. Each focus group spanned 90 minutes. Participants represented six of the ten districts in the province of KZN, SA. There was no other presence involved in data collection besides the research team (three of the authors) as facilitator/co-facilitator/moderator of the discussion, and the participants.

Focus Group Schedule

The initial questions for the discussion schedule were reviewed and refined with the research team with knowledge and experience in knowledge translation and or neonatal care. The questions were refined within a theoretical framework to focus on occupational therapists that worked with high-risk infants supported by evidence found in literature and from the team's clinical experiences. (Figure 2 above).

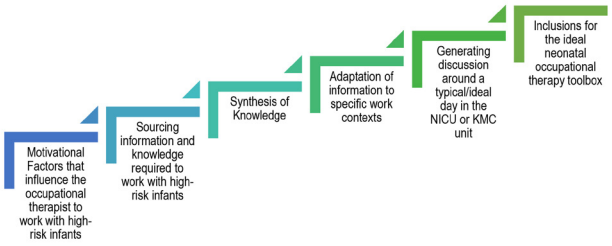


Figure 2: Open-Ended Questions posed in the virtual Focus Group.

Pilot Study

A pilot study with two community service occupational therapists was conducted. Refinement in the presentation style of the questions and how the discussions would be facilitated were acknowledged by the team. The primary issue identified was internet connectivity and the background noise from the participant's video calls.

Main Study

The sessions were conducted in English. Discussions were recorded via the audio recorder available on ZOOM. The facilitators made memos during the session. This assisted with a preliminary analysis of possible themes that could emerge from the data. Each focus group spanned 90 minutes. Data saturation were reached once no new themes could emerge from the data; therefore, further coding was not feasible[34]. Transcripts were returned to participants for comment. Two authors listened to the audio recordings prior to the transcripts being available. Transcripts were also checked and rechecked against the audio recordings to ensure credibility[35].

Data Analysis

The transcribed data were imported into NVivo (version 12 Pro), for the organisation. The data were analysed separately and repeatedly to identify initial coding using thematic analysis[36]. Word trees and thematic maps were generated on NVivo. A hybrid approach that included a shared data-driven inductive deductive method was utilised to demonstrate rigour in the thematic analysis[37]. This approach to analysing the data complemented the instrument questions by allowing the principle of KT and occupational therapy in the care of the high-risk infant to be fundamental in deductive reasoning whilst still letting themes emerge from the data using inductive reasoning[37]. Documenting of evidence through this approach displayed credibility, validity and trustworthiness in the research method[38]. The coding process involved the reduction of data into initial themes. These were later categorised into themes and sub-themes (16 codes and seven subcodes), and the relevant verbatim responses were highlighted to support the findings. The final stages of the data analysis included grouping the possible themes and sub-themes identified from the initial coding[36]. Emergent themes were reduced to five core themes based on the objectives of the study.

Ethical Considerations

The Biomedical Research Ethics Committee (BREC/00001886/2020) and the DOH Research and Knowledge Management Directorate (NHRD Ref. KZ_202008_066) issued ethical approval for the study.

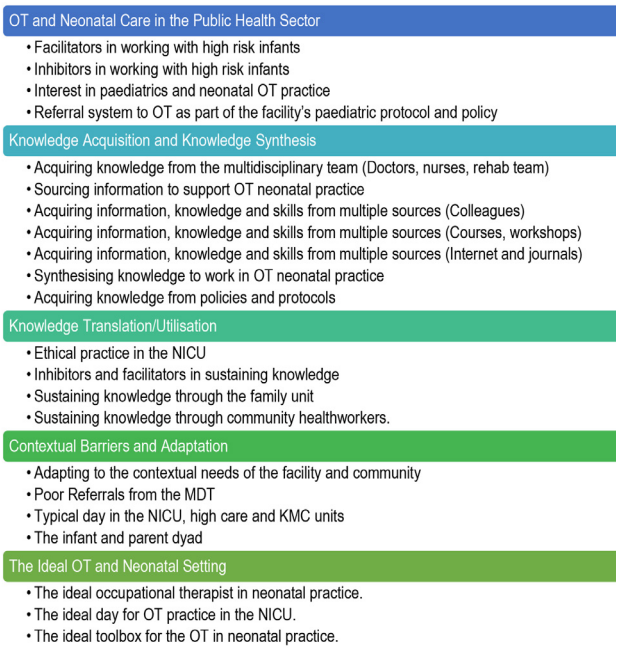


Figure 3: Summary of Themes and Subthemes.

Trustworthiness, reliability, credibility, and dependability

Triangulation can be described as using numerous data sources, models, and methodology to provide valuable information to a study[35]. Triangulation occurred by peer debriefing the coded data from the transcripts and, eventually, the emergent themes to ensure dependability, reliability, trustworthiness, and counter researcher insider bias. This also allowed for the data to be validated. Credibility was assured by the participants' views being accurately interpreted from the audio recordings. Dependability was confirmed by keeping thorough data collection and analysis records (audit trail).

RESULTS

Five core themes with relevant sub-themes, shown in Figure 3 (above) emerged from the data and are augmented by verbatim responses.

THEME 1: Occupational therapy and neonatal care in the public health sector

Facilitators in working with high-risk infants

Participants believe that the doctors who work in paediatrics at their facilities acknowledge the role and benefit of occupational therapy intervention, Early Childhood Intervention (ECI), and neonatal care. They perceive some facilities' management as a facilitator in supporting the occupational therapy role in providing intervention to high-risk infants. The facility management also supports follow-up programmes once the infant and mother are discharged. This allows management to identify the implementation of occupational therapy programmes and increases recognition of the occupational therapy role in ECI.

> "An enabler is definitely your management where you show how well your program can run and if you feed from one programme into the next programme and you're getting early childhood disability on top of it then that's an enabling factor." **(OT1, 10–15 years clinical experience, training in paediatric NDT)**

Inhibitors in working with high-risk infants

It is perceived that health facilities in KZN are a common inhibitor in providing quality interventions to high-risk infants. They do not fund training for therapists to improve and expand their knowledge and skills. Paying for training on a personal capacity is not always affordable, as courses and workshops are costly.

> "Money is the big disabler, the fact that they don't fund training." **(OT1, 10–15 years clinical experience, training in paediatric NDT)**

Once an infant is discharged, the parent does not always comply with their follow-up appointment dates with the facility's high-risk baby clinic programmes. Follow-up appointments usually monitor the infant's medical, feeding, and overall development up to two to three years of age – this varies at different facilities. Participants identified that locating patients who default when the programme is extensive; there are time limitations and insufficient occupational therapy staffing at most public health facilities in KZN. Staffing numbers in rehabilitation have decreased since the moratorium was placed on posts in the KZN public health sector in 2016. This has led to many smaller departments being managed solely by junior therapists. Other departments in more resourced facilities struggle to provide full-time occupational therapy services in wards that consistently require assistance. An inhibitor described included not having adequate staffing to have an occupational therapist providing full-time services in the NICU.

> "Some of our disablers is that we don't have enough staff to be able to work in neonatal ICU and ideally, we'd have an occupational therapist working full time there." **(OT4, >15 years clinical experience, no additional training).**

Furthermore, participants believe they were not provided with enough knowledge and skills to work with high-risk infants during their undergraduate training. Therapists' self-learnt skills and appropriate interventions to support high-risk infants through their daily clinical experiences.

> "I think one of the barriers we have as new therapists, we weren't really trained in neonatal care on campus, and you go into this new hospital, and you have to learn as you go along." **(OT2, >15 years clinical experience and training in Little Steps)**

Interest in paediatrics and neonatal occupational therapy practice

Once therapists are placed at various facilities to complete their community service, they are likely required to provide intervention to paediatrics in all spheres. Occupational therapists who work in paediatrics generally have an interest and passion for working with infants and children.

> "Initially it was that I never had any exposure to working with neonates as a student or during varsity but once I did comm serve and started working in the department of health, obviously we got referrals for babies from the nursery and neonatal ICU, and I'm really interested in it." **(OT5, 5–10 years clinical experience, training in Little Steps and NDT advanced baby course).**

Further training, courses, and workshops focusing on ECI and neonatal care increases interest in the field, as occupational therapists feel more confident and equipped to provide therapy to high-risk infants or children. The therapist's interest in neonatal care is sustained by clinical experience, monitoring infant development if ECI is initiated, compared to an infant who had not received any intervention and therefore had poor functional outcomes.

> "It's been a combination of seeing the outcomes later in life and just knowing if you worked backwards, they could've introduced access care a lot earlier in the system and then through experience having worked with them early on and seeing the impact that an intervention can make reinforced for me why it is so essential to get into that field and the importance of early intervention." **(OT7, 10–15 years clinical experience and introductory workshop on high risk babies).**

Referral system to occupational therapy as part of protocol and policy

Most health facilities in KZN develop independent standard operating procedures (SOP) regarding paediatric referral protocols and policies to other disciplines. Occupational therapists at some facilities only assess and provide intervention to patients when the MDT refers them. Participants do not blanket cover wards due to inadequate staffing and compliance with the SOP of the facility. Some participants indicated that working with high-risk infants is not a choice of interest. They provide assessment and intervention in the NICU only upon referrals received from the doctors.

> "I don't think we're drawn to do it; I think it's a matter of the referrals that we get from the doctors and then we just do the treatment as per requirements or as we see necessary." **(OT8, 5–10 years clinical experience, training in Little Steps, WHO Infant and Young Child Feeding, Infant Sensory Integration Training).**

THEME 2: Knowledge Acquisition and Knowledge Synthesis

Acquiring knowledge from the multi-disciplinary team

Therapists acquire knowledge to support the high-risk infant through doctors, specialist paediatricians, neonatologists and nurses to develop integrated intervention strategies to help the high-risk infant and parent. Healthy relationships are formed between clinicians with knowledge brokerage being implemented as they learn and share the expertise of their roles in support of the infant and the family. Participants view the nursing staff in the NICU as an essential role player in understanding the occupational therapy scope of practice in the care of the high-risk infant. Therapists generally rely on nursing staff in reminding doctors to refer to occupational therapy. MDT ward rounds in the NICU, also promote knowledge brokerage amongst the various disciplines. The MDT have internal communication channels, where they share information or refer patients to each other.

> "The other source comes to think of it is colleagues, we have had the most amazing paediatricians and neonatologists that we got to work with, both South African and international and having that shared sort of think tank where you're working with a dietician, in combination with a paediatrician, with a neonatologist and an OT, and you're getting all together and you're starting to think about intervention strategies and everyone starts sharing expertise from their fields, we developed a strong multi-disciplinary team and we got to learn from each other which was great." **(OT7, 10–15 years clinical experience, training in introductory workshop on high risk babies).**

Sourcing information to support occupational therapy neonatal practice

Participants use the infant's clinic book (Road to Health booklet) to educate parents on the developmental milestones that the infant should achieve. The book contains simple illustrations. This makes it user friendly for mothers that are literate or illiterate.

> "The patient road to health card, road to health booklet gives us a lot on the developmental milestones." **(OT11, 2–5 years clinical experience, no further training).**

Therapist's use the information provided in the paediatric assessment forms during the infant's admission. This helps understand the infant from a medical and rehabilitation perspective as information is sourced from an MDT perspective. Besides sourcing information from the infant's admission records and booklets, data is sourced through interviews with the family. Comprehensive referral forms that occupational therapy departments in various facilities have individually created also help gather information about the infant from the treating doctor.

> "We source our info from just being able to work in the NICU, from the patient record, so the patient file, the interview with the mom or dad or the parents, from the referral letter, we have a request for consult that the doctor has to fill." **(OT11, 2–5 years clinical experience, no further training).**

Acquiring information, knowledge and skills from multiple sources

Participants acquire information, knowledge and skills from textbooks available in their departments on neonates. Colleagues with experience was the main point that participants identified in developing knowledge and skills in the care of the high-risk infant and to guide them in making

use of the correct information, advising on complex cases and treatment modalities.

> "It's just having access to speak to colleagues that have more experience, so when I first started out obviously being able to speak to people that that had more experience in the NICU." **(OT5, 5–10 years' experience, training in Little Steps and NDT advanced baby course)**

Therapist's also acquired information from policies implemented by the KZN Department of Health (DOH). This comprehensive policy is a checklist that the nurses who work in the NICU complete. This assists in identifying and providing information on an infant that is or has the potential of being classified as high risk.

> "With the new policy that's come into neonatal to try lower litigation against the department of health, there's that checklist that the nurses have to fill in and if you go through the checklist, a lot of the factors that we have had on our form are now also on that checklist. It is in our policy now and when I started there was no such thing as a neonatal check list, so there definitely are those guidelines to say if the baby isn't checking these boxes- that's a red baby, orange baby or a green baby." **(OT1, 10–15 years clinical experience, training in paediatric NDT)**

The Little Steps course, which focuses on NDSC for premature infants, is one of the most popular SA courses, which caters for the MDT who work with high-risk infants in the NICU. Participants identified this course to increase their confidence, knowledge, and skills working with high-risk infants and their families. The Little Steps course is not affordable to all therapists. Therefore, those who have attended the course provide in-service training to others to translate the knowledge to staff in their facilities on NDSC strategies to implement in the NICU.

> "The Little Steps course which we haven't attended personally but have gotten in-service training from therapists that did it and the suggestions made for how you can work in the neonatal ICU were brilliant and we just took it back and in serviced it in our hospital and just said how can we ask the nursery to intervene." **(OT9, 2–5 years' experience, training in infant massage and breastfeeding).**

Academic supervisors from the University of KZN provide knowledge brokerage through offering workshops on working with high-risk infants to clinicians. Academic supervisors also educate students whilst they are at their clinical sites. This allows clinicians also to observe and learn concurrently. Therapist's keep updated neonatology by acquiring and improving knowledge by engaging with scientific evidence from published articles in journals. They use online searching to enhance their experience and understanding in classifying specific terminology used in the NICU and what factors would influence an infant's medical and functional prognosis once they are discharged.

> "There's lots of really superb cutting-edge research coming out so accessing journal articles in the latest neonatal journals, there's also a lot of OT research coming out which is very exciting." **(OT7, 10–15 years clinical experience and introductory workshop on high risk babies).**

Synthesising knowledge to work in occupational therapy neonatal practice

Participants who have two to five years of experience synthesise information that they have accessed from various sources and use it through trial and error in intervention with patients to observe what is useful and what is not. They believe that most of the knowledge and skills they develop or acquire are through their own clinical experiences and reasoning.

> "I think it comes down to your clinical reasoning at the end of it, there's so much information out there, you want to use your clinical reasoning in addition to the information you gather to provide the best possible treatment." **(OT9, 2–5 years' experience, training in infant massage and breastfeeding).**

THEME 3: Knowledge Translation/Utilisation

The inhibitors and facilitators in sustaining knowledge

Therapists attribute doctors in smaller facilities as inhibitors in maintaining knowledge in neonatal care. This is due to them rotating frequently and not prioritising rehabilitation with high-risk infants. Therefore, they do not refer infants for therapy.

> "From my experiences in district hospitals I find it more difficult to get buy in from medical staff. You know doctors are rotating the whole time and you're trying to play catch up and their doctor meetings are not- the focus on rehab and intervention is not as strong." **(OT7, 10–15 years clinical experience and introductory workshop on high risk babies).**

Participants believe that scheduling occupational therapy in in-service medical rosters and providing consistent in-service training to educate doctors and nurses on the occupational therapist's role in the care of the high-risk infant, on the occupational therapy referral process and what programmes are offered at the facility and on discharge, act as a facilitator in sustaining knowledge in facilities. In-service training may help build a trusting relationship with the occupational therapy department and accept occupational therapy as a valuable member of the MDT. They also believe that getting the medical manager on board may help sustain knowledge transfer of the occupational therapist's role in the care of the high-risk infant amongst the paediatric medical team.

> "We did in-service training with our nurses on how to implement some of the care practices, we also did in-service training with every single intern-medical-

intern that was coming through, so that everyone in the team is aware of how to implement your therapeutic approaches so it's not just therapy and it becomes the base standard the entire system runs on." (OT7, 10–15 years clinical experience and introductory workshop on high risk babies).

Therapists believe that another facilitator in sustaining knowledge of the occupational therapist's role in neonatal intervention uses scientific evidence to prove to hospital management that occupational therapy interventions may assist the facility in decreasing expenses. They perceive the parent role in the NICU as essential in sustaining knowledge in the high-risk infant's care. Participants educate the parent individually or in groups and adapt the intervention to the infant and parent dyad's specific needs.

> "So, another thing that was done was a lot of work with the parents one-on-one as well as in groups and then seeing how you can adapt your care approach specifically to the parents' needs and how is that best going to achieve a dyadic approach in that moment, how best you're going to get the child and parent to work together." (OT7, 10–15 years clinical experience and introductory workshop on high risk babies).

THEME 4: Contextual barriers and adaptation

Adapting to the contextual needs of the facility and community

Participants engage with their past and present knowledge and experiences and combine them with scientific evidence to develop and adjust intervention strategies to their specific contexts. They indicated that most research in neonatology comes from first world countries and may not suit the SA context.

> "You also need to consider the resources at your institution because a lot of the research that comes out is from first world countries, and we don't always have those kinds of resources. So, it's always nice to see what they are using and try to think out the box and how we can use a similar sort of idea to get the same result." (OT9, 2–5 years' experience, training in infant massage and breastfeeding).

They have developed language-appropriate education pamphlets for parents and caregivers at their facilities. Participants employed at tertiary institutions prioritise what information should be given to a parent or caregiver as they are not admitted for long periods. They believe that selecting the most applicable information to the parent comes with experience.

> "Because we're tertiary and we not retaining these kids for a long period, kind of being able to prioritise what you hand over to the caregiver and that comes with a bit of practice as well because you want to help the mom as much as you can and give them as much but sometimes, I find that less is more." (OT6, 5–10 years clinical experience, introductory workshop to at risk infants).

Poor Referrals from the MDT

Therapists indicate that although doctors rotate at the smaller hospitals every few months, some do not acknowledge or understand the occupational therapy role in neonatal care even if there is a continuous in-service training programme.

> "I think the doctors that we work with do rotate, but most of the time they are there for like 2/3 months, so depending on the doctors…some of the doctors don't really work close with rehab at all. You trying to inform them maybe that this is what OT does and this is how we can actually play a role they still for whatever reason generally don't refer." (OT13, 5–10 years clinical experience and introductory workshop on high risk infants)

Typical day in the NICU, high care and Kangaroo Mothercare units

Participants describe an average day in the NICU as busy, short and chaotic due to working around the infant's sleep and wake states or the parent not always being present. Participants feel that the NICU and Kangaroo Mother Care (KMC) environments are supportive. There is continuous training amongst staff and parents daily, in classes, groups and individual education.

> "I think short and chaotic summarises it for me, you go in there and this baby is sleeping and the other one is deep quiet sleep, and you can't interact with that one and you move to the next one but mom is showering and then you're here and then you're there, so it often felt quite chaotic." (OT7, 10–15 years clinical experience and introductory workshop on high risk babies).

> "It is usually quite busy in the morning, but it is a nice environment for me to work in because the team is very supportive and there's a lot of training that goes on and it's constant." (OT1, 10–15 years clinical experience, training in paediatric NDT)

THEME 5: The ideal occupational therapist and neonatal setting

The ideal occupational therapist in neonatal practice

Therapists believe that the ideal occupational therapist must be a confident person knowledgeable in neonatal care. She must also have an assertive personality to engage with the MDT to facilitate change. They also indicate that if the undergraduate training for working with high-risk infants was comprehensive, occupational therapists may feel more equipped to work in the NICU.

> "I think if we had a richer training system that would contribute more into having decent therapists. I think the other thing is passionate therapist, someone who is interested in it; you don't want someone who is half-hearted in the NICU, it's very emotionally intense work,

> it's very draining work so I think you need someone with gentleness with an equal thick skin. I think someone who can work as well with your neonates as well as your parents, a lot of communication skills with your staff." **(OT7, 10–15 years clinical experience and introductory workshop on high risk babies).**

Participants also describe the ideal occupational therapy as being patient, compassionate and educated in the field of neonatal care. They do not believe that a junior therapist should work in the NICU. Participants view work in the NICU as a 'specialised" field of practice in occupational therapy, and the therapist working there should have adequate training and experience to make them feel confident.

> "I think a very patient, compassionate and an educated person in that field. I don't think your comm serve is the person that should be in that space. The person must be trained, neonatal ICU in my view is a specialised field and I don't think that comm serves can actually work there because if you are starting, you need first to understand the environment you are working in." **(OT4, >15 years clinical experience, no additional training)**

The ideal day in occupational therapy practice in the NICU

The ideal day for an occupational therapist working in the NICU was described as: having a good working relationship amongst the MDT and having the time and flexibility to structure your workday.

> "I think the ideal day would include proper team connection, as well as just the time to be flexible and fluid in who you see and when." **(OT7, 10–15 years clinical experience and introductory workshop on high risk babies).**

The ideal toolbox for the occupational therapist in neonatal practice

Therapists envision the ideal toolbox to include protocols for occupational therapists working in the NICU based on scientific evidence for various diagnoses. Participants think it should consist of standardised SA assessment tools applicable to the country's context and population group. They believe that this assessment's data can be utilised to develop research within the South African context in occupational therapy and neonatal care. They would like the ideal toolbox to have a room allocated solely for family and parent counselling.

> "I think what I would really like in the toolbox is a South African assessment that is sensitive to our population, and we can really start using that to generate our own data and to stand our ground on an international level in terms of research." **(OT7, 10–15 years clinical experience and introductory workshop on high risk babies).**

Participants indicate that it is difficult for them and other occupational therapists who have not had further training in working with high-risk infants to identify what the ideal toolbox should consist of, compared to therapists who have received additional training.

> "I think it's quite hard for us who haven't had further training in high-risk babies, it's hard for us to say what would be ideal whereas a person who has had that training may have a lot of things they would think would be most beneficial to kids." **(OT9, 2–5 years' experience, training in infant massage and breastfeeding).**

DISCUSSION

This study's findings have outlined the knowledge to practice gaps for occupational therapists supporting high-risk infants in the KZN public health sector. Doctors working in paediatrics recognise the value of occupational therapy in ECI and neonatal care in some hospitals. Hospital management acknowledges occupational therapy services once they see the benefits of early developmental care, especially with morbidity cases. Receiving support from management contributes to the successful implementation of NDSC, and may decrease the facility's expenses through shorter admissions and fewer health complications[15,20]. Research has identified that the early implementation of NDSC encourages high-risk infants' overall development[39-40].

In several studies, it has also been recommended that high-risk infants be referred to occupational therapy to provide early intervention programmes to promote neurocognition, performance in areas of occupation, maternal mental health, and family-centred care to sustain knowledge supporting the infant and parent dyad [15,20]. Inhibitors in working with neonates, including a lack of funding for training in neonatal care for occupational therapists, with training being unaffordable for many therapists correlate to a previous study, in which junior therapists stated attending neonatal courses was difficult as they were costly. In the occupational therapy profession, permanent staff shortages in the KZN DOH inhibit consistent care of high-risk infants in the NICU and strain therapists [6,41].

It was found that participants who work in paediatrics at their hospitals generally are interested in working with children and neonates. Further training in neonatal care increases a therapist's confidence and interest in the field. Studies have found that therapists with little clinical experience feel incompetent, have decreased self-confidence, engage in interventions with flawed clinical reasoning and face challenges with their skill level and what is expected of them in the work environment[42-43]. Participants outlined that seeing positive developmental outcomes with early intervention encouraged an interest in neonatal care. Other participants had no interest in working with neonates but followed the referral process, SOP of their facilities and the occupational therapy scope of practice to intervene only as required. This is aligned with findings from a study in which occupational therapists did not work in the NICU due to a lack of interest in neonatal care[6].

Participants acquire information and knowledge from a range of professionals in the MDT. Working relationships are formed between disciplines to implement knowledge brokerage to learn and share individual roles in supporting

the high-risk infant. Information is shared during in-service training, ward rounds, and internal communication channels. This is consistent with studies in which working in an MDT has been highlighted as beneficial to ensure consistency in the neonate's care [15,44-46]. Information to support the infant and parent was acquired through working in the NICU and from other sources such as referral forms, admission booklets, interviews with the parent and the South African DOH Road to Health booklet, which consists of an immunisation schedule, developmental and growth monitoring as well as other health information for infants and young children. Participants' clinical knowledge and skills were acquired through textbooks, online searching, consulting with experienced colleagues, DOH nursing policies, journal articles, courses and support from the University of KZN lecturers. A lack of DOH policies for the occupational therapy role and specific practice in neonatal care could be an area for future research; this may help provide a standard of care across the KZN province.

A scoping study outlined that experienced occupational therapists used evidence-based practice (EBP) in clinical decision making, using online research, reading relevant literature, and increasing knowledge and skills by attending courses and workshops for professional development in fields of interest [7,26,47-48]. The 'Little Steps' course focusing on NDSC for preterm infants was identified as the most common course attended by occupational therapists. This correlates to two other studies that have recognised the course to be helpful in the operationalisation of NDSC amongst the MDT working in the NICU[6,15.] The synchronisation of acquired information, knowledge and skills was considered from a therapist's own clinical experiences and practice. Experience plays a vital role in increasing the self-confidence of an occupational therapist and integrating research into practice[7].

Frequent staff rotations and doctors' disinterest to refer infants to occupational therapy make it challenging to sustain neonatal services[6]. The focus on rehabilitation is not prioritised as medical concerns take precedence. Providing in-service training to the MDT on the occupational therapy role facilitates knowledge sustainment and optimises NDSC practices [15]. EBP guidelines for NDSC come from first world countries and are adapted by professionals to the SA context [15,49]. Participants adopt and adapt international guidelines according to their resources and the population they service. This may assist in relaying information to caregivers and suggesting contextually appropriate intervention methods. Some participants outlined a typical day in the NICU as a brief, chaotic, but supportive MDT environment. The ideal occupational therapy to service the NICU needs to be trained, confident, compassionate, assertive, and motivated to encourage practice change amongst the MDT. Junior therapists are not recommended to work in the NICU due to their lack of training and experience. This correlates with findings from other studies [20,42-43]. An ideal day in the NICU is having positive working relationships with the MDT, time, and flexibility to provide individualised infant and family centred care. Participants envision the ideal neonatal toolbox to consist of standardised South African assessment tools and EBP protocols specific to occupational therapy whilst others felt like they could not imagine what the ideal would be, as they received no further training in neonatal care. The following stage in this study is to determine what is required in KT interventions via a consensus process[50].

Limitations

The study was limited to one province in SA and only included occupational therapists in the public health sector; therefore, the findings may not outline occupational therapists' perceptions in the country as a whole or on an international level. The qualitative design and small sample size may not represent the perceptions of all occupational therapists. A response bias may have developed, as occupational therapists who had no interest or little knowledge in supporting high-risk infants did not respond to the invite for participation.

CONCLUSION

The findings demonstrate that the knowledge to practice gaps for occupational therapists employed in the public health sector of KZN are insufficient training in neonatal care due to postgraduate courses being unaffordable and not receiving funding or training from the DOH to improve knowledge and skills. A decreased interest of some occupational therapists to support high-risk infants may indicate a gap in practice. Severe staff shortages place strain on therapists as they are unable to provide consistent care in the NICU. Frequent doctor rotations and a poor understanding of the occupational therapy role in neonatal care result in infants not being referred to occupational therapy. Resources, training of occupational therapists, and SOPs relating specifically to the occupational therapy role in neonatal care in the public health sector appear to be necessary to inform a standard of care across the province of KZN.

Author Contributions

Ayesa Dawood completed this study as part of a masters study and was responsible for drafting the manuscript. Pragashnie Govender was the principal investigator of the larger study and primary supervisor of the study. Samantha York assisted in the data collection and analysis. Gina Rencken and Michael Ogunlana were co-supervisors and collaborators on the larger study. All authors contributed to critical review and revisions of the manuscript.

Acknowledgements

The authors wish to acknowledge Ms NN Khanyile for her assistance in data transcription. The authors also acknowledge author Samantha Jo York, posthumously (1993-2023) for her contributions to this study.

Declaration of Conflicting Interests

The authors declare that they have no competing interests.

REFERENCES

1. United Nations Children's Fund (UNICEF). Nurturing care for early childhood development: A framework for helping children survive and thrive to transform health and human potential. World Health Organization, Geneva; 2018.

Available from: https:/apps.who.int/iris/bitstream/handle/10665/272603/9789241514064-eng.pdf [Accessed 21 April 2020]
2. Aylward GP. Neurodevelopmental outcomes of infants born prematurely. Journal of Developmental & Behavioral Pediatrics. 2014; 35(6):394-407. https:/doi.org/10.1097/01.dbp.0000452240.39511.d4
3. Mwaniki MK, Atieno M, Lawn JE, Newton CR. Long-term neurodevelopmental outcomes after intrauterine and neonatal insults: A Systematic Review. The Lancet. 2012; 379(9814):445-52. https:/doi.org/10.1016/s0140-6736(11)61577-8
4. Gagliardi AR, Dobrow MJ. Identifying the conditions needed for integrated knowledge translation (ikt) in health care organisations: Qualitative interviews with researchers and research users. BMC Health Services Research. 2016; 16(1):256. https:/doi.org/10.1186/s12913-016-1533-0
5. Jacobs L, Casteleijn D, Lubbe W. Neurodevelopmental supportive care in South African NICUs - An essential change of attitude. World Federation of Occupational Therapists (WFOT), Johannesburg: University of the Witwatersrand; 2018. Available from: https:/congress2018.wfot.org/downloads/presentations/SE77/lizelle_jacobs.pdf [Accessed: 21 April 2020]
6. Hardy M, Govender P, Naidoo D. Novice occupational therapist's experience of working in neonatal intensive care units in KwaZulu-Natal. South African Journal of Occupational Therapy. 2021; 51(1):27-35. https:/doi.org/10.17159/2310-3833/2021/vol51n1a5
7. Thomas A, Law M. Research utilisation and evidence-based practice in occupational therapy: A scoping study. American Journal of Occupational Therapy. 2013;67(4):e55-e65. https:/doi.org/10.5014/ajot.2013.006395
8. Hockenberry MJ, Wilson D. Wong's nursing care of infants and children-e-book: Elsevier Health Sciences; 2018. https:/doi.org/10.1097/00001163-199110000-00015
9. Nightlinger K. Developmentally supportive care in the neonatal intensive care unit: An occupational therapist's role. Neonatal Network. 2011; 30(4):243-8. https:/doi.org/10.1891/0730-0832.30.4.243
10. Royal College of Occupational Therapists. Occupational Therapy in Neonatal Services and Early Intervention. Practice Guideline. 2017:1-52. Available from: https:/www.rcot.co.uk/practice-resources/rcot-publications/downloads/neonatal-services [Accessed: 25 April 2020].
11. Craig JW, Smith CR. Risk-adjusted/neuroprotective care services in the NICU The elemental role of the neonatal therapist (OT, PT, SLP). Journal of Perinatology. 2020; 40(4):549-59. https:/doi.org/10.1038/s41372-020-0597-1
12. Sherry K. Disability and Rehabilitation: Essential considerations for equitable, accessible and poverty-reducing health care in South Africa. South African Health Review. 2014; 2014(1):89-99.
13. Hoque M, Haaq S, Islam R. Causes of neonatal admissions and deaths at a rural hospital in KwaZulu-Natal, South Africa. Southern African Journal of Epidemiology and Infection. 2011; 26(1):26-9. https:/doi.org/10.1080/10158782.2011.11441416
14. Robinson JE. Access to employment for people with disabilities: Findings of a consumer-led project. Disability and Rehabilitation. 2000; 22(5):246-53. https:/doi.org/10.1080/096382800296818
15. Lubbe W. Best practice guidelines for neurodevelopmental supportive care of the preterm infant: North-West University; 2010. Available from: http:/repository.nwu.ac.za/bitstream/handle/10394/3656/Lubbe_Welma.pdf?sequence=3&isAllowed=y [Accessed: 18 May 2020].
16. Graven SN. Sound and the developing infant in the NICU: Conclusions and recommendations for care. Journal of Perinatology. 2000; 20(1):S88-S93. https:/doi.org/10.1038/sj.jp.7200444
17. Lloyd LG, De Witt T. Neonatal mortality in South Africa: How are we doing and can we do better? South African Medical Journal. 2013; 103(8):518-9. https:/doi.org/10.7196/samj.7200
18. Lubbe W, Van der Walt CS, Klopper HC. Integrative literature review defining evidence-based neurodevelopmental supportive care of the preterm infant. The Journal of Perinatal & Neonatal Nursing. 2012; 26(3):251-9. https:/doi.org/10.1097/jpn.0b013e3182650b7e
19. Hinchliffe SR, Seaton SE, Lambert PC, Draper ES, Field DJ, Manktelow BN. Modelling time to death or discharge in neonatal care: An application of competing risks. Paediatric and Perinatal Epidemiology. 2013; 27(4):426-33. https:/doi.org/10.1111/ppe.12053
20. Butler ML. The self-reported perceptions of the multi-disciplinary team regarding standards of neurodevelopmental supportive care in the neonatal intensive care unit; 2018. Available from: https:/wiredspace.wits.ac.za/bitstream/handle/10539/25338/ML%20BUTLER%20(MSC.%20OT)-%20THE%20SELF-REPORTED%20PERCEPTIONS%20OF%20THE%20MULTI-DISCIPLINARY%20TEAM%20REGARDING%20STANDARDS%20OF%20NEURODEVELOPMENTAL%20SUPPORTIVE%20CARE%20IN%20THE%20NEONATAL%20INTENSIVE%20CARE%20UNIT.pdf?sequence=1 [Accessed: 15 February 2022]
21. KwaZulu-Natal OT Forum. Annual provincial report Pietermaritzburg; Greys Hospital. 2019.
22. Cameron KAV, Ballantyne S, Kulbitsky A, Margolis-Gal M, Daugherty T, Ludwig F. Utilization of evidence-based practice by registered occupational therapists. Occupational Therapy International. 2005; 12(3):123-36. https:/doi.org/10.1002/oti.1
23. Korner-Bitensky N, Wood-Dauphinee S, Teasell R, Desrosiers J, Malouin F, Thomas A, et al. Best versus actual practices in stroke rehabilitation: Results of the Canadian National Survey: 57. Stroke. 2006; 37(2) https:/doi.org/10.1016/j.apmr.2007.01.005
24. Chard G. Adopting the assessment of motor and process skills into practice: Therapists' voices. British Journal of Occupational Therapy. 2006; 69(2):50-7. https:/doi.org/10.1177/030802260606900202
25. Bennett S, Tooth L, McKenna K, Rodger S, Strong J, Ziviani J, et al. Perceptions of evidence-based practice: A survey of Australian Occupational Therapists. Australian Occupational Therapy Journal. 2003; 50(1):13-22. https:/doi.org/10.1046/j.1440-1630.2003.00341.x
26. Copley JA, Turpin MJ, King TL. Information used by an expert paediatric occupational therapist when making clinical decisions. Canadian Journal of Occupational Therapy. 2010; 77(4):249-56. https:/doi.org/10.2182/cjot.2010.77.4.7
27. Lyons C, Casey J, Brown T, Tseng M, McDonald R. Research

knowledge, attitudes, practices and barriers among paediatric occupational therapists in the United Kingdom. British Journal of Occupational Therapy. 2010; 73(5):200-9. https:/doi.org/10.4276/030802210x12734991664147
28. Petzold A, Korner-Bitensky N, Salbach NM, Ahmed S, Menon A, Ogourtsova T. Increasing knowledge of best practices for occupational therapists treating post-stroke unilateral spatial neglect: Results of a knowledge-translation intervention study. Journal of Rehabilitation Medicine. 2012; 44(2):118-24. https:/doi.org/10.2340/16501977-0910
29. Menon A, Korner-Bitensky N, Kastner M, McKibbon K, Straus S. Strategies for rehabilitation professionals to move evidence-based knowledge into practice: A systematic review. Journal of Rehabilitation Medicine. 2009; 41(13):1024-32. https:/doi.org/10.2340/16501977-0451
30. Green L, Gorenflo DW, Wyszewianski L. Validating an instrument for selecting interventions to change physician practice patterns. J Fam Pract. 2002; 51(11):938-42.
31. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. International Journal for Quality in Health Care. 2007; 19(6):349-57. https:/doi.org/10.1093/intqhc/mzm042
32. Govender P. Identifying and bridging the knowledge-to-practice gaps in rehabilitation professionals working with at-risk infants in the public health sector of South Africa: A multimethod study protocol. BMJ Open. 2021; 11(5):e039242. https:/doi: 10.1136/bmjopen-2020-039242
33. Ludema JD, Cooperrider DL, Barrett FJ. Appreciative inquiry: The power of the unconditional positive question. Handbook of Action Research. 2006:155-65.
34. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. Field Methods. 2006; 18(1):59-82. https:/doi.org/10.1177/1525822x05279903
35. Creswell JW, Creswell JD. Research design: Qualitative, quantitative, and mixed methods approaches: Sage Publications; 2017.
36. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006; 3(2):77-101. https:/doi.org/10.1191/1478088706qp063oa
37. Fereday J, Muir-Cochrane E. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. International Journal of Qualitative Methods. 2006; 5(1):80-92. https:/doi.org/10.1177/160940690600500107
38. Koch T. Establishing rigour in qualitative research: The decision trail. Journal of Advanced Nursing. 1994; 19(5):976-86. https:/doi.org/10.1111/j.1365-2648.1994.tb01177.x
39. Wallin L, Eriksson M. Newborn individual development care and assessment program (NIDCAP): A systematic review of the literature. Worldviews on Evidence-Based Nursing. 2009; 6(2):54-69. https:/doi.org/10.1111/j.1741-6787.2009.00150.x
40. Legendre V, Burtner PA, Martinez KL, Crowe TK. The evolving practice of developmental care in the neonatal unit: A systematic review. Physical & Occupational Therapy in Pediatrics. 2011; 31(3):315-38. https:/doi.org/10.3109/01942638.2011.556697
41. Shung-King M, Lake L, Sanders D, Hendricks Me. Child, and adolescent health: Leave no one behind. Cape Town: Children's Institute: University of Cape Town, 2019. https:/doi.org/10.7196/sajch.2020.v14i4.01853
42. Hodgetts S, Hollis V, Triska O, Dennis S, Madill H, Taylor E. Occupational therapy students' and graduates' satisfaction with professional education and preparedness for practice. Canadian Journal of Occupational Therapy. 2007; 74(3):148-60. https:/doi.org/10.1177/000841740707400303
43. Robertson DM. Critical thinking and clinical reasoning in new graduate occupational therapists: A phenomenological study. 2012.
44. Müller M, Myburgh A, Stock R. The training and role of occupational therapists in South African neonatal intensive care units. [Unpublished]. University of the Witwatersrand Faculty of Health Sciences, School of Therapeutic Sciences: Johannesburg; 2016
45. van Wyk H, de Beer M. Inter-professional education: Healthcare students' experiences. South African Journal of Occupational Therapy. 2017; 47(2):35-40. https:/doi.org/10.17159/231-3833/1017/v47n2a6
46. King G, Strachan D, Tucker M, Duwyn B, Desserud S, Shillington M. The application of a transdisciplinary model for early intervention services. Infants & Young Children. 2009; 22(3):211-23. https:/doi.org/10.1097/iyc.0b013e3181abe1c3
47. Vachon B, Durand MJ, LeBlanc J. Using reflective learning to improve the impact of continuing education in the context of work rehabilitation. Advances in Health Sciences Education. 2010; 15(3):329-48. https:/doi.org/10.1007/s10459-009-9200-4
48. Sharoff L. Integrating Youtube into the Nursing Curriculum. The Online Journal of Issues in Nursing. 2011; 16(3):1-6.
49. Als H, Lester BM, Tronick EZ, Brazelton TB. Toward a research instrument for the assessment of preterm infants' behavior (APIB). Theory and Research in Behavioral Pediatrics: Springer; 1982. p. 35-132. https:/doi.org/10.1007/978-1-4899-0442-3_2
50. York SJ, Rencken G, Ogunlana MO, Dawood A, Govender P. Expert opinions on knowledge-translation interventions for occupational therapists working with neonates in South Africa: A delphi study. Health SA Gesondheid. 2022. 27-10. https:/doi:10.4102/hsag.v27i0.1724

Assessment of participation in collective occupations: Domains and items

AUTHORS
Fasloen Adams[a,b]
https://orcid.org/0000-0001-6742-3727
Daleen Casteleijn[b]
https://orcid.org/0000-0002-0611-8662

AFFILIATIONS
[a] Division of Occupational Therapy, Department of Health and Rehabilitation Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, South Africa.
[b] Department of Occupational Therapy School of Therapeutic Sciences, University of the Witwatersrand, Johannesburg, South Africa.

CORRESPONDING AUTHOR
Daleen Casteleijn
Daleencastleijn61@gmail.com

KEYWORDS
collective participation, co-occupation, VdTMoCA, creative ability, occupational therapy, health programmes

HOW TO CITE THIS ARTICLE
Adams F, Casteleijn D. Assessment of participation in collective occupations: Domains and items. South African Journal of Occupational Therapy. Vol 53 No2, August 2023.
DOI: https://doi.org/10.17159/2310-3833/2023/vol53n2a9

ARTICLE HISTORY
Received: January 2021
Reviewed: May 2022
Revised: June 2022
Accepted: Nov 2022
Published: August 2023

EDITOR
Blanche Pretorius
https://orcid.org/0000-0002-3543-0743

DATA AVAILABLITY
Upon reasonable request from the corresponding author.

FUNDING
No funding was received for this research.

ISSN On-line 2310-3833

ABSTRACT

Introduction: Occupational therapists work with groups of people who engage in collective occupations to have a positive influence on their health and wellbeing. Although the concept of collective occupations is described and defined in occupational science literature, little has been done on specific assessment tools to guide clinicians on how well people are engaging in collective occupations.
Aim: This article describes the development of an assessment tool to assess participation in collective occupations in a South African context.
Method: A mixed methods approach with a sequential exploratory design was used. Domains and items were generated from a literature review on collective occupations as well as semi-structured interviews with occupational therapy experts in community settings. Data were thematically analysed using a priori coding. The Vona du Toit Model of Creative ability was used to frame the coding. Domains and items emerged from the data.
Results: The result was the development of five domains and 19 items that could be used to measure and describe collective participation in occupations. Domains include collective's motivation, ability to perform action, ability to form a collective, ability to produce and end product, emotional-cognitive functioning and collective relations.

Implications for practice:
To work with groups of people, clinicians not only need to understand the nature of collective participation but also need to understand why people participate in them. They should also have insight in the abilities needed to effectively participate as a collective. Understanding of a collective's behaviour in the above-mentioned domains, could guide occupational therapists in planning intervention to enhance collective participation in occupations. The levels of collective participation could guide occupational therapists to gain insight into the potential and behaviour of collectives. Such understanding can enable effective intervention-, preventive- and promotive health programmes with collectives.

INTRODUCTION

When the concepts of collective occupation emerged in occupational science theory, it was linked to the social development of human beings including the need to belong or be part of a collective[1,2]. An important consideration in occupational therapy is the benefits of people participating in collective occupations and maintaining this ability[2,3,4,5]. Collective action and/or collective participation in occupations is seen as a powerful concept for communities to change their situation for the better. Linking to this, as a profession, occupational therapy can contribute to addressing determinants of health and to decrease social inequality by facilitating occupational participation. This role is often performed in a primary level of health care and community-based settings and includes working with individuals and collectives through health promotion and prevention programmes[6].

In South Africa, services in communities and social development sectors[4,7,8] focus not only on individuals but also on collectives of people to facilitate better health and

wellbeing. Additionally, many occupational therapists use community-based rehabilitation and development principles that advocate for intervention on a collective level rather than on an individual one. This focus on a collective level raises three concerns. Firstly, current profession-based theories, models and tools draw attention to the understanding of and working with the individual rather than with collectives[9, 10, 11, 12]. Secondly, occupational therapy group related literature concentrates on therapeutic groups formed by clinicians. There is little published in occupational therapy on naturally formed groups such as those formed by members itself due to shared needs[13] which are common to community and primary levels of care. Clinicians working with these groups are applying current theories and models to collectives without evidence to support the effectiveness of such application. Lastly, discourse around collective occupation has been focussed on definitions and descriptions of collective participation, with limited suggestions on classification and tools for measurement thereof[4].

Several measurement tools are available to assess individual's occupational performance[14]. However, none have been developed with collective occupational participation in mind. Although there are guidelines and measurement tools to describe community participation[15], none describe collective occupational participation. Similarly, group functioning scales and measurements of group processes, assess the group process from an individual point of view and do not emphasise the performance of the collective.

Fogelberg and Frauwirth[16] developed a framework to describe collective participation in occupations as 'occupational systems'. They identified three levels to describe how occupation can be performed by collectives; group, community and at population level. Similarly, the Occupational Therapy Practice Framework[17] describes performance patterns for groups and populations and includes group intervention as a type of occupational therapy intervention. Both frameworks give a brief description of collective behaviour on these levels, but these cannot be used to measure the ability or inability to collectively participate in occupations. There is thus an awareness of the importance of collective participation, but assessment and intervention guidelines of collective participation are areas that need further investigation.

The Vona du Toit Model of Creative ability (VdTMoCA) is a model often used by South African occupational therapists[18]. Although this model is used with individual clients, there are fundamental concepts in this model that recognise the importance of the collective. Du Toit[19] postulated that people on lower levels of creative ability are focused on egocentric needs while higher levels transcend the self and contribute towards communities and societies in a constructive, selfless way. Higher levels of creative ability realise the benefits of working as a collective. Du Toit[19:11] further explained mutuality as "being responsible together" and quoted Nel who said that "Man is only then a human being in his directedness towards other human beings"[19:5]. Humans thus have a need to communicate with others and to be part of a collective, but these needs only emerge from the level of Passive Participation (level four) and increase in quality and dimension in the higher levels. The levels of creative ability show increasing amounts of motivation and action in people and these levels could be explored to measure collective participation in occupations.

Levels of community participation were described by Thomas and Thomas[20] in five levels. The lowest level describes a community who receives services but contributes nothing in return (level 1), i.e. 'passive action', and then progress to a community where programmes are run by community members with financial and technical assistance (level 5), i.e. 'independent action'. These community participation levels are a general description and do not have specific items or descriptors for observations. Occupational therapists need a comprehensive assessment of the level of a collective's participation in occupation. In addition, a scale with specific descriptors for each level on the scale, needs to be developed. This scale should also be based on a theoretical framework which speaks to the fundamental concepts of occupational science and occupational therapy.

This article reports on selected sections of a doctoral research study that aimed to develop and validate domains, items, and descriptors for levels of collective participation in occupations.

METHODOLOGY

Research design

A mixed methods approach with a sequential exploratory design[21] was used for the larger doctoral study. Phase 1 of the research was the 'conceptualisation phase' where the construct of collective participation was explored. The findings from the conceptualisation phase were used in the second phase which was the 'operationalisation phase'. The development of the domains and items in phase 2 and 3 of the study were guided by a process suggested by Hudak, Amadio and Bombardier[2] namely: domain and item generation, item reduction and validation of items. In this phase, domains and items were generated and framed by the VdTMoCA[19]. The third phase of the research validated the instrument and was reported in the original thesis [5] and is not included in this article.

Data collection procedure

In order to generate domains and items to assess collective participation in occupations, data were gathered through two sources namely: semi-structured interviews and a literature review.

Semi-structured interviews

Semi-structured interviews were used to explore participants' perceptions of the concept of collective occupations and collective participation in occupations. Eleven participants were purposively selected to take part in the interviews. Occupational therapists who have worked in a primary health care or community setting for three or more years were invited to participate. Additionally, they had to be familiar with the concept of collective occupation and have experience in working in a community. This section of the research has already been reported in an article and the detailed information is available in Adams and Casteleijn[4].

Table I: Review guide for included articles

Article characteristics	Options	Comments
Author(s):		
Reference:		
Type of article	Editorial/ Opinion/ Research	
Phenomena/interest explored		
Qualification of author(s)		
Setting		
Methodology		
Is the evidence provided?	Theory-based / Experience-based	
Inclusion of literature	Relevant to phenomena under investigation	
	Relevant to occupational science	
	Inclusion of research results	
If the type of article classifies as a research article	Research methodology	Congruity with research question and objectives of study
	Participants	Demographics and number
	Data gathering method(s)	Congruity with research question and objectives of study
	Data analysis	Congruity with methodology
		Comprehensive description of results evident including voices of participants
	Was ethical permission obtained and were ethical considerations adhered to?	
	Is the link evident between results and conclusions drawn?	
General	Special notes or observations	
Relevance to research project	Conceptual definitions, possible items	

Literature review

The second source of information was a literature review which followed the steps described by Brereton *et al.*[23] as a guide. In Step 1, the review was planned by stating the research question and the review criteria were developed. The research question was two-fold: firstly, how is collective participation defined in the literature and secondly, what are the characteristics and nature of collective occupation from occupational therapists' point of view?

A guide for reviewing the articles consisted of demographics of the article, type of article, the methodology followed and in the case of research articles, the detail of the sample, data collection and data analysis. Lastly, a comment was included on how the article linked to the research question of our study. Table I (adjacent) presents the guide.

Step 2 was the actual searching, identifying and selection of articles following the inclusion and exclusion criteria. Inclusion criteria were that the article should have been written from an occupational science of occupational therapy perspective, collective participation should be the main focus of the article with specific reference to participation in occupations. The articles should have contained clear definitions of collective participation. Articles were excluded if the focus was on (a) critiquing individual participation in occupations and (b) reporting on collective participation without discussion characteristics of a collective from an occupational science or occupational therapy perspective.

The search strategy occurred in three rounds with Boolean terms: Round one used the search term "collective occupation*", the second search used the term "co-occupation*" and the third search combined the terms "co-occupation*" and "occupational science". The search time limit was 2006 to 2015 as the study concluded in 2015. After the articles were identified, the first author completed the review guide (Table I. adjacent) for each article. The second author cross-checked 30% of the articles, using the same review guide to ensure that the review process was accurate.

Step 3 was to extract the data to answer the research question and to document the findings. This was the analysis part of the literature review and is described below under data analysis.

Selection of domains and items for assessment of collective participation in occupations

After data were collected from the two sources: semi-structured interview and a literature review, the findings were tabulated. This information was then used to generate items for the assessment of collective participation.

Data Analysis

Semi-structured interviews were thematically analysed and findings were reported in Adams and Casteleijn[4]. Data analysis of the literature review comprised a description of the demographic information of the articles that were generated after the three rounds of searches. Data were extracted from the articles by identifying concepts used to define and describe the characteristics of collective participation in occupations. Descriptions of core characteristics of collective participation from the authors'

Table II: Documents selected for the literature review

Title	Author(s)	Reference	Type of article
Guest editorial (no title)	Noralyn Davel Pickens and Kris Pizur-Barnekow	Journal of Occupational Science, 2009, 16(3), pp 138–139.[24]	Guest editorial
Co-occupation: Extending the dialogue	Noralyn Davel Pickens and Kris Pizur-Barnekow	Journal of Occupational Science, 2009, 16(3), pp 151–156.[25]	Opinion piece
Co-occupation: The challenges of defining concepts original to occupational science	Doris Pierce	Journal of Occupational Science, 2009, 16(3), pp 203–207.[2]	Opinion piece
A complexity science approach to occupation: Moving beyond the individual	Donald Fogelberg and Stacy Frauwirth	Journal of Occupational Science, 2010, 17(3), pp 131–139.[16]	Opinion piece
Learning to promote occupational development through co-occupation	Pollie Price and Stephanie Miner Stephenson	Journal of Occupational Science, 2009, 16(3), pp 180–186.[26]	Research article
Explaining collective occupations from a human relations perspective: Bridging the individual-collective dichotomy	Elelwani Ramugondo and Frank Kronenberg	Journal of Occupational Science, 2015, 22 (1), pp 3–16.[27]	Opinion piece
Enacting the critical potential of occupational science: Problemizing the 'individualizing of occupation'	Debbie Laliberte Rudman	Journal of Occupational Science, 2013: 20(4), pg. 298–313.[28]	Opinion piece
Collective occupations: A vehicle for building and maintaining work relationships	Elelwani Ramugondo and Frank Kronenberg	Verbal presentation. World Federation of Occupational Therapy Congress. Santiago, Chile, 2010.[29]	Transcription of a verbal conference presentation

perspectives were noted and described.

Possible domains and items were generated from the findings of the semi-structured interviews and literature review and then tabulated. Domains were taken from constructs in the VdTMoCA. The constructs included motivation, action, ability to handle tools, objects and materials in the environment, ability to relate to others, ability to show initiative, ability to exert effort, ability to control anxiety, ability to produce an end-product. This model was selected to frame the domains in an occupational therapy perspective since it is a commonly used model in South Africa. The authors also are of the opinion that there are a few fundamental concepts that align with actions of collective participation and should be explored. Furthermore, the model already describes levels of motivation and action in individuals and the researchers believed that the levels may also be suitable for levels of collective participation.

To reduce items, the same framework as for domains were used. Deductive content analysis was done by constantly comparing each possible item with the nine constructs suggested by du Toit. If an item fit into a construct for example, the 'ability to show initiative' fits the construct of initiative in the VdTMoCA, it was retained. If the item was similar to another item or did not fit into any of the constructs, it was deleted. When all the items were deliberated, the final set of items were allocated to domains. Domain names were selected from the VdTMoCA but adapted if the literature review and semi-structured interviews came up with a more suitable name for a domain.

Ethical clearance for the entire study was obtained from the Human Research Ethics Committee of the Faculty of Health Sciences of the University of the Witwatersrand. The ethics number is M110219.

RESULTS

Literature review findings

Initially, 82 articles were identified, but on review only five articles adhered to the search parameters. The diverse definition of the word 'occupation' was found to be problematic when searching literature due to the various interpretations of it. Two additional articles that were not identified in the initial searches were identified by a colleague. One transcribed verbal conference paper was also added. All the identified articles were reviewed in order to extract and synthesise relevant data. Table II (above) presents the eight documents that were used for data extraction.

All the articles were published in the Journal of Occupational Science between 2009 and 2015. Only one article was a research article that used narrative analysis with one case study. Five articles were opinion pieces and one guest editorial which was a summary of the articles on collective occupations and co-occupations published in 2009 (volume 3) in the Journal of Occupational Science. Due to the low number of appropriate articles, a transcribed verbal presentation on collective participation at the World Federation of Occupational Therapy Congress in Chile in 2010 was included. It was difficult to judge the quality of the papers due to the narrative and qualitative descriptions but useful information for the purpose of generating items could be extracted. The first valuable concept was how and why collective occupations or co-occupations emerged in occupational therapy. There was an unease among occupational scientists with the focus on the individual persons engaging in occupations with little attention to socio-political and social justice matters that affect occupational participation[2,28].

Figure 1a: Initial domains of collective participation

Figure 1b: Final domains of collective participation

Figure 2: Final domains and items allocated to each domain

The term 'co-occupation' was described by many of the authors and refers to a high level of interaction of two or more people engaging in occupation. This engagement does not need to be in the same space or same time but should shape or influence those involved in the co-occupation[2,25,26].

The term 'collective participation' was also used by many of the authors. Ramugondo and Kronenberg[27] mentioned that intentionality behind the occupations needs to be acknowledged in any collective engagements. Their definition of collective participation was informative and comprehensive and explained it as "occupations that are engaged in by groups, communities and/or populations in everyday contexts, and may reflect the need for belonging, and a collective intention towards social cohesion or dysfunction" Ramugondo and Kronenberg[29:12]. This definition of collective participation is thus more comprehensive than co-occupations.

Both Pierce[2] and Ramugondo and Kronenberg[27,29] pointed out that the intention to engage in a collective occupation may be constructive or destructive. 'Constructive collective occupations' include a group of women who run a soup kitchen for homeless people while a 'destructive collective occupation' can be groups who destroy infrastructure to voice their dissatisfaction and frustration. Other useful concepts were mentioned by Pickens and Pizur-Barnikow[25] when they stated that a collective usually has shared emotionality (responds to others' emotions), intentionality (understanding each other's role and purpose) and physicality (reciprocal motor actions).

Generation of domains and items

Concepts of collective occupation that derived from the literature review were combined with the concepts derived from the semi-structured interviews[4]. Due to space limitations, those findings are not repeated in this article. Altogether, [36] possible items were listed, 12 from the literature review and 24 from the semi-structured interviews [5]. These 36 items were allocated to nine domains which were taken from constructs of the VdTMoCA (Figure 1a above). The first step in the development of the assessment was thus completed.

Reduction of domains and items

The deductive content analysis eliminated 17 items and the final 19 items (Figure 2) were then allocated to five domains (Figure 1b, above). The domains are motivation, action, product, collective relations and emotive-cognitive functioning.

Reflection and discussion of domains, their accompanying items and the process

This study proposes that motivation, action, product, collective relations, and emotive-cognitive functioning (Fig 1b) be used as the basis for assessment of participation in collective occupations. These domains are familiar to occupational therapists and are common domains in assessment of individual clients and although not yet applied to collective participation, they have the potential to accurately described the actions and behaviours of collectives. This proposed domains, items and descriptors is a guide to clinicians to expand their understanding of these components in relation to collectives.

Initially, the study intended to use the nine constructs identified by du Toit as domains, however, through deductive content analysis of the data, these were reduced to five domains. By reducing the domains, the intention was to ensure that it is as practical as possible for occupational

therapists to use in future. The domains and items are discussed below.

Domain 1: Motivation

Motivation is defined as biological, social, emotional and/or cognitive forces that drive, guide, initiate and maintain goal-directed behaviour [30] . It is considered to be the inner drive or internal state of a person that drives behaviour, action and initiation[30]. Motivation is dynamic and is dependent on the stage of human development[19] .

The results of the thematic analysis of the semi-structured interviews linked the items of shared meaning and shared intentionality[4] with collective motivation. Firstly, this means that a collective needs to have the intention to participate as a collective to address a problem or to achieve goals. This intention to participate acts as their motivator or drive to work collectively[27] . Without a collective intention, collective motivation could be compromised. Shared meaning is one of the driving forces for shared intentionality. This means there needs to be a shared understanding of why individuals have to participate collectively in occupations.

Questions that one can explore to identify the motivation of a collective may include what drives the collective to engage in specific occupations, what is their intention that drives the behaviour? It is also important to ask what the shared meaning that the collective experience is when they are motivated to engage in certain occupations.

Domain 2: Action

Action is defined as "the exertion of mental and physical effort which results in occupational behaviour"[19:7]. It is a process of being active or doing something and thereby translating motivation into effort. According to the VdTMoCA, motivation drives action and action results in doing and in the case of collective action, it leads to co-creation.

Through thematic analysis and the literature review, items allocated to this domain were; co-creating, symbiotic action, equal action or symmetrical action, shared space and time, a collective's ability to take initiative, ability to exert effort and lastly, the ability to handle tools and resources . Effort is a subjective feeling of exerting one's self in activity participation[31] and implies the use of energy (physical or mental) to do or produce something. A person thus exerts physical or mental effort to perform action and this also applies to a collective who need to put in effort to get things done.

Findings of step 1 of this research defined co-creation as "an active process where people in a collective create together"[4:84] . This 'creating together' and the outcomes of it should be beneficial to all parties involved, it is thus symbiotic in nature which implies that the effort that is exerted by all involved, should be equal or symmetrical in nature. When linking this information to the definition of action mentioned above, it can be said that collective participation in occupations is the exertion of collective mental and physical effort which results in occupational behavior.

Within collective action, the collective should be able to take initiative thus starting and maintaining action and plans to achieve goals. Initiative is self-direction and self-application in activity participation usually in a new situation[19]. In laymen's terms, initiative refers to a new plan or process to accomplish a goal or solve a problem[32] . In the context of a collective, initiative is related to a collective's readiness to take action and apply themselves to make the best decision in new situations. The level of the collective will determine whether they are able to take initiative or whether they are dependent on leadership for this.

Results from the literature review suggest that shared physical space and time is needed for collective participation in occupations, although Pierce[2] contradicts this information by saying that shared space is not essential. However, there is evidence in psychology literature that highlights the importance of a shared space and time for collective action[33] .

Handling of tools and resources is related to the manipulation and use tools and of resources within the community in which the collective is situated. The use of tools and resources is important for action[19] . The absence of tools and materials could influence collective action negatively, however, to understand the collective participation of a specific collective one also needs to observe at how they handle tools and resources as the collective. Several questions need to be asked. For example: Are they using it for the benefit of the collective or only to the benefit of some individuals in the collective? Are they using tools for the benefit of the collective or more for the benefit of achieving outcomes related to all in the community? Additionally, are they only using the tools and resources within the collective or are they also using available tools and resources outside of the collective?

Domain 3: Product

A product is something that is made or achieved by humans, or produced through an industrial process, or something that is grown through a natural process[32] . It is the outcome or consequence of action and effort. The product can be tangible or intangible. Within a collective the product should be related to their purpose (what they wanted to achieve) and their collective formation. The product of the collective is related to their vision and goals, meaning the collective action they participated in is aimed at achieving their vision and goals.

Forming of a collective can be a product, but also an end result of a process (the process of collective formation). The mere formation of a collective could be a product if it is related to their goals. For example, women with disability forming a support group. The collective's intention was to start a group where women with disabilities could support each other. Thus, collective formation was part of this intention and vision. How and why the collective formed as well as how involved external facilitators and /or community leaders were in this process, could enhance understanding of collective participation.

Domain 4: Collective relations

This domain focusses on relations or associations between members in the collective. It includes how the collective relates to other collectives in their community. For example, how a collective liaises with other collectives to achieve objectives or gain information. The items of this domain all emerged from the thematic analysis of the semi-structured interviews which were *interaction, cohesion, communication,*

mutual responsibility and mutual accountability[4].

Interaction is mutual or reciprocal participation. Meaning that members in the collective need to respond to each other's communication and/or actions. This response is reciprocal in nature and not only one person acting and communicating. It is similar to the symmetrical co-creation that was described earlier. Without the interaction there is no collective participation. This needs to be an active process as people need to respond to each other. Preferably, there needs to be mutual benefit and the relationship needs to be symbiotic. Interaction also needs to be part of the values of the collective and needs to occur continuously for a collective to be successful. Initially this might be leadership driven but as a collective develops and their cohesiveness is established, members should be more comfortable interacting without the intervention of the leader[34].

Cohesion was described by participants in the semi-structured interviews as a connection that is crucial for collective participation[4]. The level of cohesion within a collective will enhance elements of effort, action, motivation, and relations, to name a few. Cohesion is depended on members connecting with others, mutual vulnerabilities and needs that facilitates a need to connect and working together. There is a link between connecting with another (cohesion) and co-creating. Successful participation in a collective and co-creating can increase cohesion in a collective positively. Similarly, cohesion can make it easier for members of a collective to co-create or participate collectively.

Mutual accountability is where members of a collective consider themselves to be answerable to each other in the collective. This could be a personal value of the individuals in a collective but can also be part of a collective's norms and values. For mutual accountability to be successful, members in the collective need to accept responsibility *(mutual responsibility)* and account for their part. As a collective, they also must be accountable for the actions and results of their collective actions. Additionally, individual members and the collective as a whole must accept the obligation and duty to contribute to the achievement of the goals for the collective itself or for the collective's community[4] .

Lastly, *communication*, which is defined as the exchange of thoughts and ideas is important for collective participation as without this interaction, cohesion and co-creating is not possible. The act of communicating includes not only verbal and non-verbal communication skills but listening skills as well4 . Again, dependency on leadership needs to be explored here. The following questions need to be answered: Can the collective communicate appropriately without guidance of a leader? Do they all communicate with each other or is communication more between members and the leader of the collective? Are there dominant members that do all the talking?

Domain 5: Emotive-cognitive functioning

This domain focusses on how the collective handles situations on an emotional level for example, *handling of anxiety and conflict as well as their collective problem-solving and decision-making abilities.* The balance between cognitive and emotive abilities could provide insight into the collective functioning. For example, can a collective control their emotions and affect to the benefit of collective decision-making and problem solving?

Additionally, participants suggested that *openness of a collective to new members, situations and ideas* also need to be explored. It was felt that the more confident and cohesive a group is, the more open they will be. Insecurities within collectives could influence this negatively[4]. This is similar to the VdTMoCA that suggests handling of situations and anxiety as important to consider when assessing individual clients[19] . Additionally, participants in the semi-structured interviews suggested that exploration of how collectives handle conflict situations, problem solving, and decision making should be considered when assessing collective participation[4].

Questions that need to be explored here are: Is the collective aware of the need for decision making, problem-solving and conflict management? Can they do this as a collective or is it driven by the leader or dominant members. The five domains with its allocated items should not be viewed as separate constructs. From the discussion above, it is clear that different items influence each other across domains. One should thus be mindful of interactions between items and this will differ from collective to collective.

When comparing the suggested domains and items from this study to other measuring tools for collectives, there are some similarities. For example, the Group Climate Questionnaire is a self-report tool that aims to measure individual group member's opinions of the group's therapeutic environment[35]. Although it focusses on the individual point of view, it does include engagement and conflict management as domains and items for evaluation, which has similarities to this study. Similarly, the Curative Climate Instrument is also a self-report measurement that measures the helpfulness of therapeutic factors[36] utilised in group therapy. This measurement tool focusses on the individual perspective, however it does include cohesion, and group belonging as part of the items, which is similar to this study.

This article does not present the observable actions for each item due to space. Adams[5] describes observable actions for each item on the levels of creative ability from self-differentiation to contribution level which can be viewed in the original PhD thesis[5].

Implications of the research

This research holds numerous benefits for occupational therapists working with collectives. Occupational therapists are familiar with and often work with therapeutic groups that are formed by clinicians to achieve common aims amongst individuals[13, 34], however, we are less familiar with groups as collectives in communities. These therapeutic groups often focus on individual clients and not on the achievement of collective goals. This research suggests naturally formed groups (formed by the members for achievement of collective and individual outcomes), that are more focused on the collective than on the individual are becoming a familiar intervention strategy in occupational therapy[4].

Occupational therapists working in community-based settings, often work with groups within communities

who choose to or are forced to participate in collective occupations to enhance the health and wellbeing of the group or community. To achieve this, occupational therapists do not only have to understand the nature of collective participation but also need to understand why people participate in them, and understand what abilities are needed to effectively participate as a collective. Understanding of a collective's motivation, ability to perform action, ability to form a collective, ability to produce and end product, emotional-cognitive functioning and collective relations could guide occupational therapists in planning intervention to facilitate collective participation in occupations.

The formulation of five descriptors for levels of collective participation according to the identified domains and 19 items allows clinicians to determine the current level of functioning of a collective on seven levels. Using VdTMoCA guidelines can then be used for planning community intervention.

Now that the descriptors of levels for collective participation have been developed, field testing by clinicians needs to take place. Additionally, further exploration of how these domains and items will be assessed in practice, is needed.

Limitations of the study

The literature review could have followed the steps of a scoping review but at the time of the planning of the study an adapted systematic review was selected before we had knowledge of which types of studies would have been found. The time frame for publications for the literature review fell in the time when the PhD study was done. Several publications after 2015 about collective occupations were published which could have been included. It is recommended that an updated scoping review should be completed to update the findings and for consideration for inclusion in the assessment tool.

CONCLUSION

Through this research project domains and items for the understanding of collective participation were developed. Five domains namely motivation, action, relations, product and emotional-cognitive functioning were developed. Collectively the domains have 19 associated items. The VdTMoCA was used to guide the development of domains and items.

This study brings together occupational therapy epistemology and African philosophy. The understanding that humans find purpose in communicating with their fellow man[19], and are inextricably connected with each other[27] should shift our focus from individual to collective participation in occupations. Collective participation is a common occurrence in South Africa. It is a dynamic process that sees symbiotic interaction between individuals and groups of individuals. The mutual vulnerabilities, visions, benefits, and accountability within collectives create a change agent that could surpasses the effectiveness of individuality.

A healthy collective holds the potential to benefit individual within the group as well as the collective as a whole. Understanding a collective is the bedrock of effective intervention to address and solve many of the problems affecting the health of all South Africans. This study developed domains and items that can be used to understand a collective's participation in occupations. This would enable occupational therapists to harness the power of collectives.

Competing interests

The authors declare that they have no competing interests to declare

Author contributions

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: Fasloen Adams and Daleen Casteleijn. Drafting the work or revising it critically for important intellectual content: Fasloen Adams and Daleen Casteleijn. Final approval of the version to be published: Fasloen Adams and Daleen Casteleijn. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: Fasloen Adams and Daleen Casteleijn.

REFERENCES

1. Pierce D, Marshall A. Staging the play: Maternal management of home space and time to acilitate infant/ todller play and development. In: Esdaile S, Olson J, editors. Mothering occupations: Challenge, agency and participation. Philadephia: F A Davis; 2004. p. 73-94.
2. Pierce D. Co-occupation: The challenges of defining concepts original to occupational Science. Journal. 2009;16(3):203-7 https:/dx.doi.org/10.1080/14427591.2009.9686663.
3. Hagedorn R. Tools for Practice in Occupational Therapy: A Structured Approach to Core Skills and Processes. Edinburgh: Churchill Livingstone; 2000.
4. Adams F, Casteleijn D. New insights into collective participation: A South African perspective. South African Journal of Occupational Therapy. 2014;44(1):81-7.
5. Adams F. Development of descriptors for domains and items for collective participation in occupations. Johannesburg, South Africa: University of Witwatersrand; 2016. Retrieved from http:/hdl.handle.net/10539/21262
6. Letts L. Health promotion. In: Blesedell Crepeau E, Cohn C, Boyt-Schell B, editors. Willard and Spackman's Occupational Therapy. 11th ed. Baltimore: Lippincott Williams & Wilkins; 2009. p. 165-80.
7. African National Congress. A national health plan for South Africa. Pretoria; 1994.
8. WHO. Declaration of Alma Ata. Alma Ata, USSR1978.
9. Iwama M. Culturally relevant occupational therapy. London: Churchill Livingstone Elsevier; 2006.
10. Dickie V, Cutchin M, Humphry R. Occupation as transactional experience: A critiques of individualism in occupational science. Journal. 2006;13(1):83-93 https:/dx.doi.org/10.1080/14427591.2006.9686573.
11. Cutchin M, Aldrich R, Bailliard A, Coppola S. Action theories of occupational science: The contributions of Dewey and Bourdieu. Journal. 2008;15(3):157-65 https:/dx.doi.org/10.1080/14427591.2008.9686625.
12. Fisher AG, Marterella A. Powerful Practice: A Model for

Authentic Occupational Therapy. Fort Collins, CO: Center for Innovative OT Solutions; 2019.
13. Becker L, Duncan M. Thinking about groups. In: Becker L, editor. Working with groups. Cape Town: Oxford University Press; 2005. p. 31–51.
14. Hemphill BJ, Urish CK. Assessments in Occupational Therapy Mental Health: An Integrative Approach. New York: Slack, Incorporated; 2020.
15. Rifkin SB. Paradigm Lost: Towards a new understanding of community participation in health programmes. Acta Trop. 1996;61:79–92.
16. Fogelberg D, Frauwirth S. A complexity science approach to occupation: Moving beyond the individual. Journal. 2010;17(3):131–9 https:/dx.doi.org/10.1080/14427591.2010.9686687.
17. American Occupational Therapy Association. Occupational Therapy Practice Framework: Domain and Process. Journal. 2020;74(7412410010) https:/dx.doi.org/ 10.5014/ajot.2020.74S2001.
18. Casteleijn D. Using measurement principles to confirm the levels of creative ability as described in the Vona du Toit Model of Creative Ability. South African Journal of Occupational Therapy. 2014;44(1):14–9.
19. Du Toit V. Patient Volition and Action in Occupational Therapy. Johannesburg: Vona & Marie du Toit Foundation; 2009.
20. Thomas M, Thomas MJ. Manual for CBR planners. Asia Pacific Disability Rehabilitation Journal. 2003:1–88.
21. Creswell JW, Klassen AC, Plano Clark VL, Smith KC. Best Practices for Mixed Methods Research in the Health Sciences2011. 541–5 p.
22. Hudak PL, Amadio PC, Bombardier C. Development of an upper extremity outcome measure: the DASH (disabilities of the arm, shoulder and hand). Journal. 1996;29(6):206–8 https:/dx.doi.org/10.1002/(SICI)1097-0274(199606)29:6<602::AID-AJIM4>3.0.CO;2-L. .
23. Brereton P, Kitchenham BA, Budgen D, Turner M, Khalil M. Lessons from applying the systematic literature review process within the software engineering domain. Journal. 2007;80(4):571–83 https:/dx.doi.org/10.1016/j.jss.2006.07.009.
24. Pickens ND, Pizur-Barnekow K. Guest editorial. Journal of Occupational Science. 2009;16(3):138–9.
25. Pickens ND, Pizur-Barnekow K. Co-occupation: Extending the dialogue. Journal. 2009;16(3):151–6 https:/dx.doi.org/10.1080/14427591.2009.9686656.
26. Price P, Stephenson SM. Learning to promote occupational development through co-occupation. Journal. 2009;16(3):180–6 https:/dx.doi.org/10.1080/14427591.2009.9686660.
27. Ramugondo E, Kronenberg F. Explaining collective occupations from a human relations perspective: Bridging the individual–collective dichotomy. Journal. 2015;22(1):3–16 https:/dx.doi.org/https:/doi.org/10.1080/14427591.2013.781920.
28. Laliberte Rudman D. Enacting the critical potential of occupational science: Problematizing the 'individualizing of occupation'. Journal. 2013;20(4):298–313 https:/dx.doi.org/10.1080/14427591.2013.803434.
29. Ramugondo E, Kronenberg F. Collective occupations: A vehicle for building and maintaining work relationships 15th World Congress fo the World Federation of Occupational Therapists; Santiago, Chile2010.
30. Furnham A. Motivation. In: Comer R, Gould E, Furnham A, editors. Psychology. West Sussex: John Wiley & Sons, Ltd; 2013. p. 375–405.
31. Sherwood W. An investigation into the theorectical construction of effort and maximum effort as a contribution to the theory of creative ability. Johannesburg: University of the Witwatersrand; 2016. Retrieved from http:/hdl.handle.net/10539/21261
32. Cambridge Dictionary. Online dictionary: Cambridge University Press; 2020 [13 October 2020]. Available from: https:/dictionary.cambridge.org/dictionary/english/initiative.
33. Barlow J, Dennis A. Not as smart as we think: A study of collective intelligence in virtual groups 2014 [Available from: jordanbarlow.files.wordpress.com/2014/05/barlow-dennis-2014-ci-abstract.pdf.
34. Howe C, Schwartzberg S. A functional approach to group work in occupational therapy. . 3rd ed. Philadephia: Lippincott Williams & Wilkins; 2001.
35. Johnson J, Pulsipher D, Ferrin S, Burlingame G, Davies D, Gleave R. Measuring group processes: A comparison of the GCQ and CCI. Journal. 2006;10(2):136–45 https:/dx.doi.org/10.1037/1089-2699.10.2.136.
36. Yalom I. The Theory and Practice of Group Psychotherapy. New York: Basic Books; 1995.

AUTHORS
OTASA acknowledges the contributions of the writing committee: Azette Swanepoel, Aluwani Manenshe, Annamarie Lombard, Jenny McAdam, Herculene van Staden

KEYWORDS
mental health, physical health, social support, work environment, workplace wellness programme

HOW TO CITE THIS POSITION PAPER
South African Association of Occupational Therapy. Employee wellness: Position paper of the Occupational Therapy Association of South Africa (OTASA). South African Journal of Occupational Therapy. Vol53 No2 August 2023
DOI: https://doi.org/10.17159/2310-3833/2023/vol53n2a10

ARTICLE HISTORY
Ratified by OTASA Council: 2019
Submitted: April 2023
Not a peer reviewed article
Accepted: June 2023
Published: August 2023

EDITOR
Blanche Pretorius
http://orcid.org/0000-0002-3543-0743

DATA AVAILABILITY
OTASA head office can be contacted at otoffice@otoffice.co.za

FUNDING
No funding was received for the compilation of this position paper

ISSN On-line 2310-3833

Employee wellness: Position paper of the Occupational Therapy Association of South Africa (OTASA)

INTRODUCTION

Employee wellness is central to meaningful engagement in work occupations and contributes positively to conflict resolution, stress management and productivity in the workplace[1]. An employee who experiences wellness in the workplace will thus act accordingly with confidence; demonstrate emotional regulation skills, creativity, and resilience. This sentiment is supported by the South African Framework

Table I Demographic information

Employment Sector					Public Sector						Higher Education	Non-Governmental Organisation	Other
	Private Practice 58.72 %	Private Hospital Group 4.09 %	Insurance Company 1.60 %		DoH 20.28 %	DoE 9.79 %	RAF 5.16 %	DoL 0.53 %	SASSA 0.18 %				
	64.41 %				35.94 %						6.41 %	3.02 %	4.8 %
Province	Gauteng	Western Cape	KwaZulu Natal		Eastern Cape	Free State	Mpumalanga	Limpopo	North West		Northern Cape	-	-
	51.15 %	18.12 %	10.48 %		5.86 %	5.58 %	4.26 %	3.37 %	2.31 %		0.89 %	-	-
Years of Experience	Student	0-10 years			11-20 yrs	21-30yrs	>30 yrs	-	-		-	-	-
		1-5 yrs 23.27 %	6-10 yrs 15.10 %					-	-		-	-	-
	0.71 %	38.37%			29.13 %	20.60 %	11.37 %	-	-		-	-	-
Personal Life	Relationships				Dependents					Gender			
	Married	Single	Stable relationship	Divorced	No dependents	1 dependent	2 dependents	3 dependents		Female	Male	Gender: Prefer not to say	
	61.46 %	24.40 %	8.53 %	2.66 %	43.69 %	14.56 %	27.18 %	12.61 %		97.69 %	2.14 %	0.53 %	

for the Employee Health and Wellness in Public Service[1], which stives to support healthy and productive employees. Employee wellness manifests through physical, intellectual, social, emotional, spiritual, moral, ethical and occupational well-being[1:29].

Factors influencing wellness have been identified as a person's cultural-, personal and temporal context and environment, meaningful occupational engagement[2,3], positive emotions, engagement, relationships, accomplishments[4], work demands, and organizational influences1 to name a few. These factors are all subjective to the person and depend on the internal and external resources of the person[1].

As occupational therapists we focus on the health and wellness of our clients, but do we afford ourselves the same focus? How mindful are occupational therapist of the factors influencing their wellness and their responses to those factors? In response to growing concerns regarding wellness of occupational therapists, OTASA conducted an online survey during 2020 to obtain an understanding of the perceptions of occupational therapy staff regarding their wellness.

SURVEY RESULTS

A total of 562 responses to the survey were received. The results of the survey are presented below.

Demographic information

The demographic information regarding the respondents is presented in Table I (adjacent).

Employment sector

In terms of employment sector, most of the respondents reported working in the private sector (64.41%), of which most worked in private practice (58.72%) and for private hospital groups (4.09%). Many respondents reported working in the public sector (35.94%) of which most worked in the Department of Health (20.28%), Department of Education (9.79%), and the Road Accident Fund (5.16%). The respondents who reported working in Higher education accounted for 6.41%.

Geographical location

Approximately 80% of the respondents were employed in three provinces, namely Gauteng (51.15%), Western Cape (18.12%) and KwaZulu-Natal (10.48%).

Years of experience

The majority of respondents had up to ten years of experience (38.37%), of which most had between one and five years of experience (23.27%) and the remainder had worked as occupational therapists for between six and ten years (15.10%). The percentage of respondents generally decreased with increasing number of years of experience, with 29.13% reporting having worked for between eleven and twenty years, 20.60% reporting having worked for between twenty-one and thirty years, and 11.37% reporting having worked for more than thirty years respectively.

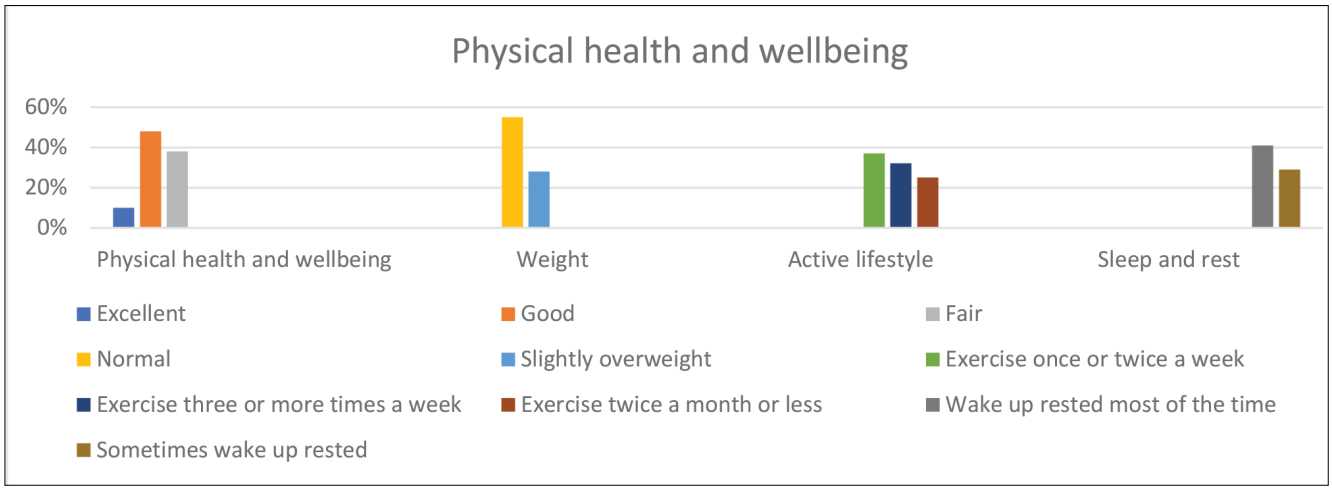


Figure 1: Physical health and wellbeing.

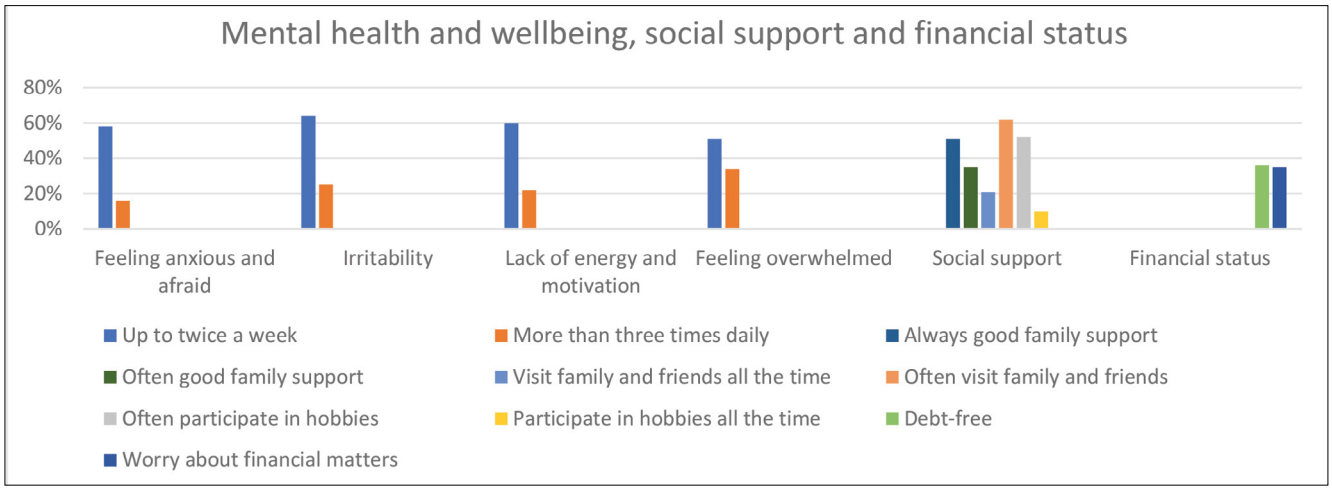


Figure 2: Mental health and wellbeing, social support and financial status.

Personal life

The majority of the respondents were married (61.46%), female (97.69%) and had no dependents (43.69%) or two dependents (27.18%)

Health and wellbeing

Physical health and wellbeing

As shown in Figure 1 (page 96) most respondents rated their general health and wellbeing as good, while many rated it as fair. Only a limited number of respondents rated their general health and wellbeing as excellent.

Most respondents rated their weight as normal, while some indicated they were slightly overweight. Similarly, many respondents indicated that they followed a healthy and balanced diet most of the time, while most reported that their diets could be improved. Drinking water on a regular basis "most of the time" was reported by the majority of the respondents, while many reported doing so for "more than eighty percent of the time".

With regards to having an active lifestyle and exercising regularly, most respondents indicated they exercised approximately once or twice weekly, while many stated that they exercised three or more times per week. Of concern was the significant number of respondents who indicated they exercised twice a month or less.

In terms of sleep and rest, many respondents reported sleeping well and waking up rested most of the time, while a number indicated only sometimes sleeping well and waking up rested.

Mental health and wellbeing

A visual presentation of mental health and wellbeing, social support, and financial status is presented in Figure 2 (above).

It was of concern that feeling anxious and afraid up to twice weekly was reported by most respondents, and that many respondents experienced these feelings up to three times daily. On the other hand, many respondents reported not having feelings of fear or anxiety at all (24.09%).

Irritability was being experienced up to twice weekly by most of the respondents, while many others reported experiencing irritability more than three times daily. A lack of energy and motivation was experienced up to twice weekly by most respondents, while these feelings were experienced more than three times daily by numerous others. Stress and feelings of being overwhelmed or overloaded were experienced up to twice weekly by half of the respondents, while a third of the respondents experienced these feelings more than three times per day.

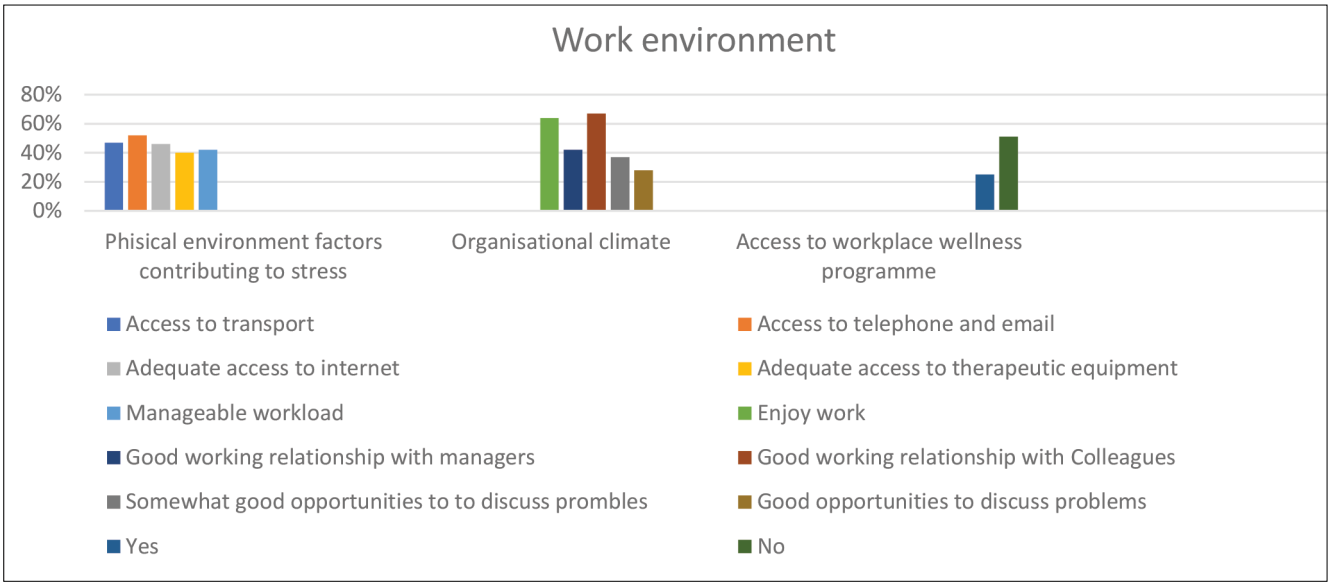


Figure 3: Work environment.

Social support

Half of the respondents indicated that they always had good family support systems, while many others reported that they often had good family support systems. In addition, more than half of the respondents reported that they often visit family and friends, while a small percentage did so all of the time.

Most respondents often participated in hobbies or activities that they enjoyed, while relatively few reported that they did so all the time. It was of concern, particularly given the philosophical basis of the profession, that many respondents rarely participated in hobbies or activities that they enjoyed (35.47%).

Financial status

An equal percentage of respondents reported that they were either debt-free and did not require any financial assistance or that they did sometimes worry about financial matters.

Work environment

The work environment consists of utilisation of leave benefits, physical work environment, organisational climate, and access to workplace wellness programme (see Figure 3 above).

Utilisation of leave benefits

The results showed that most respondents took up to ten days of voluntary vacation leave during the year prior to the survey (43.33%), while just over a third of them took between 11 and twenty days of vacation leave during the same period (27.85%).

Sick leave benefits did not appear to be over-utilised, with most respondents taking up to ten days of sick leave due to illness (48.75%), while a similar number reported having taken no sick leave during the same period (42.6%).

Physical work environment

Several of the physical work environment factors were identified as contributing a great deal to stress, namely access to transport, access to telephone and email facilities and adequate access to the internet. Adequate access to therapeutic equipment and having a manageable workload were reported to contribute a fair amount to stress.

Organisational climate

Most respondents indicated that they enjoyeded their work and felt that they were making a positive contribution. Working relationships with managers (41.81%) and with colleagues (66.67%) were reported to be good most of the time. In addition, an equal number of respondents indicated that the opportunity to discuss issues and solve problems as a team was rated as somewhat good and good most of the time.

Access to workplace wellness programme

It was notable that most respondents indicated not having access to a workplace wellness programme, while numerous respondents reported having some access to such services.

Summary of results

Occupational therapists in South Africa work in all sectors at present but are predominantly employed in private practice and the Department of Health. Physical health and wellbeing, access to social support, as well as organisational culture appear to be strengths, which may contribute to wellness of occupational therapists. On the other hand, mental health, physical work environment (particularly access to transport and telecommunications) and limited utilisation of vacation leave appear to contribute negatively to their wellness. In addition, while fulfilling an essential role and providing service delivery often under challenging circumstances, occupational therapists appear to have limited access to employee wellness services.

STATEMENT OF POSITION

OTASA believes that all occupational therapists should

have access to basic employee wellness services. It is recommended that occupational therapists:

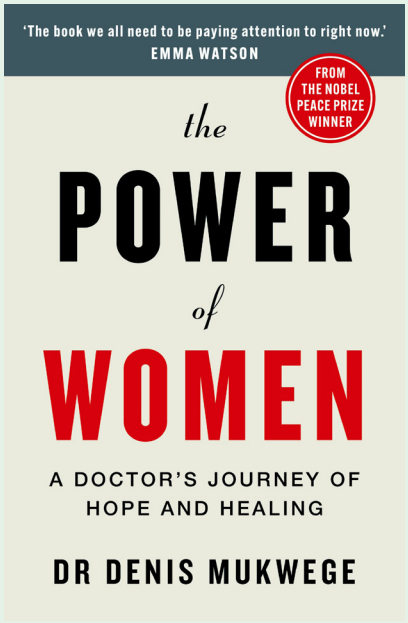
- Advocate for implementation of a minimum standard of facility, telecommunications, transport and therapy equipment across all occupational therapy services;
- Offer CPD events related to wellness strategies and development of resilience;
- Offer access to contracted wellness services for members working in the private sector;
- Advocate for provision of wellness services for occupational therapists working in the public sector,
- Support research into the causative factors of work-related stress for occupational therapists, which is warranted to inform sustainable, customised and contextually relevant wellness programmes.

CONCLUSION

OTASA is concerned that the results of the employee wellness survey point to significant wellness challenges within the South African occupational therapy fraternity. Employee wellness is essential to ensure that occupational therapists continue to provide quality services across all sectors.

REFERENCES

1. Department: Public Services and Administration. Employee health and wellness strategic framework for the public service. 2019.1–93
2. Bergh Z. Introduction to work psychology. Cape Town: Oxford University Press; 2011.
3. American Occupational Therapy Association. Occupational therapy practice framework: Domain and process. Am J Occup Ther. 2014;68(Suppl. 1):S1–48.
4. Gallagher M, Muldoon OT, Pettigrew J. An integrative review of social and occupational factors influencing health and wellbeing. Front Psychol. 2015;6(September):1–11.
5. Butler J, Kern ML. The PERMA-Profiler: A brief multidimensional measure of flourishing. Int J Wellbeing. 2016;6(3):1–48.



TITLE OF THE BOOK:
The Power of Women. A doctor's journey of hope and healing written by Denis Mukwege

AUTHOR
Denis Mukwege

INFORMATION ON THE BOOK
Published 2021
Publishers: Short Books, Octopus Publishing Company, USA 2021 and Flatiron Books, UK 2021
ISBN number: 9-781780-725352
Available in paperback ZAR 355.00 and on Amazon Kindle ZAR266.00
Number of pages: 278 pages

INFORMATION ON THE REVIEWERS
Julie Whitlock, BSc OT (Wits), DHSM (Wits) is an occupational therapist at Work-Link, a vocational rehabilitation practice in Johannesburg, South Africa
ORCID; https://orcid.org/0009-0003/0065/9243

Contact details: julie@whitlock.co.za

Declaration of bias: The reviewers have no bias to declare

HOW TO CITE THIS BOOK REVIEW
Whitlock J, A review of: The POWER of WOMEN. A doctor's journey of hope and healing written by Denis Mukwege. South African Journal of Occupational Therapy. Vol 53 No2, August 2023.
DOI: https:/doi.org/10.17159/2310-3833/2023/vol53n2a11

ARTICLE HISTORY
Submitted: October 2022
The book review was not peer reviewed
Accepted: November 2022
Published: August 2023

ISSN On-line 2310-3833

A review of: The Power of Women. A doctor's journey of hope and healing written by Denis Mukwege

Information on the author

The author of The POWER of WOMEN, Dr Denis Mukwege is a medical doctor who studied at the University of Bujumbura in Burundi and specialised in gynaecology and obstetrics in France. He returned to work in his home country, first at Lemera and then at Panzi Hospital, which he founded in 1999. Through his work with survivors of rape, he has become a campaigner for women's rights and has won a Nobel Peace Prize for his activism and work.

The setting for this book is the Democratic Republic of Congo (DRC), described as 'an area the size of Western Europe' and 'close to the middle of the world and the heart of Africa'. Although the author is of the opinion that the book is not autobiographical, it reads like an autobiography, with the history of the former Belgian Congo and the DRC interwoven with the author's personal and professional journey, and the lives of the women he is dedicated to healing. The book is interesting, and disconcerting, to read owing to the theme of rape, which runs through it. It is well-researched and detailed, and the reader must therefore digest it slowly. Dr Mukwege penned the book after he had spent two decades caring for and treating survivors of sexual violence, and had received a Nobel Peace Prize for his work. He describes the Congo as a "window into the extreme end of the global scourge of sexual violence". As per the 1955 census, life expectancy for women there was only 38 years, and childbearing was the main killer. In fact, the author's parents had both lost their own mothers in childbirth.

Mukwege was born in 1955 in a humble "shack" and grew up in Bakavu, a fishing village on the shores of Lake Kivu in what was then the Belgian Congo. In 1983 he began his career as a student medical doctor at the Swedish Mission in Lemera where, almost immediately, he had to assist the only other doctor on site with surgery, often by flashlight. He began specialising in obstetrics after witnessing the extent of the rape and maternal health crises in rural Congo and being inspired by the extraordinary women he encountered there. Describing the start of his journey, he says, "There was no prenatal care, all births were home births with no medical expertise". Also, "the hardships of life fell disproportionally upon women," who had no break from childcare, planting, cultivating, carrying of crops to markets and performing all domestic chores.

The author describes the consequences of "the neglect of women at the moment of childbirth where the design flaws of human anatomy forced them to risk their own lives to deliver new ones". Often, women in obstructive labour were carried to hospital through the jungle for days. Women were dying for lack access to a caesarian section, which caused birth complications like fistulae, incontinence, reproductive difficulties and then stigma and rejection. In Congolese society men are traditionally not involved in the childbirth process and there are societal sexist beliefs that perpetuate the problems described in the book. The author describes himself as an accidental feminist, a campaigner and advocate for women's rights, fighting the

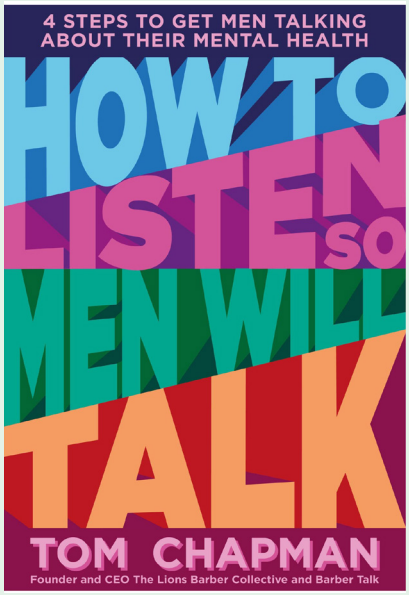
"deadly lottery of childbirth." His outrage at the violence inflicted on fellow human beings is evident in the book as is his deep appreciation for the opportunity he has had to "amplify the voices of those whose marginalization denies them opportunities to tell their stories".

Mukwege explores the influences of gender-based violence in the Congo, including the impact of the Belgian colonial system on the weakening of matriarchal roles, and the Congolese wars. He describes how rape became normalised during times of war and women were often subjected to destructive pelvic gunshot injuries. Victims of this violence also suffered from psychological disorders as a result the trauma and societal rejection, since they were often blamed for their medical conditions. The second half of the book describes the author's response to these atrocities. He becomes involved in establishing holistic care for women in the DRC and raising awareness internationally. He trains previous rape victims as grassroots workers, to mentor other survivors. Mukwege's case report of a teenage survivor of rape and obstructed childbirth and her journey from survival to healing and a purposeful, productive life is central to this book.

The author saw that the extreme violence and dislocation had a profound impact on many activities of daily living of survivors and concluded that this required redress through a holistic treatment approach and advocacy. In an action that will resonate strongly with occupational therapists, the author facilitates the setting up of small-scale activity and vocational training programmes for rape survivors, to promote physical and psychological healing and wellbeing through occupation. Rape survivors could graduate and, where possible, return to their villages and reintegrate and transform their communities.

The reviewers were intrigued by the author's exploration of the question: 'Why do men rape?' His research proposes and dissects a host of possible precipitating circumstances: the role of mineral exploitation and the links between violence against women and the manufacture of goods like the cars and mobile phones were two such examples. Dr Mukwege supports the view that positive masculinity prevents rape. He discusses how rape is prevalent in societies where there is a sense of male impunity due to judicial failings. In response, he set up a judicial clinic at Panzi Hospital, to assist women survivors in their legal rights and to train doctors in forensic medical reporting. Sadly, women and men who speak out about rape often pay a price for their bravery. Dr Mukwege was threatened by his own government when he attempted to make a speech about rape at the UN in 2011 and he survived an assassination attempt in 2012.

Although this book is not an easy read because of the brutality of the topic and the amount of detail the book contains, it is truly inspiring. The author's wholehearted advocacy for women and his practical efforts to deal holistically with the impact of rape and obstructed childbirth in women and girls in war torn central Africa, gives the reader a sense of hope that change can occur in Africa. The book is not only about Africa though; it contains insights and interventions useful to all communities and countries across the globe. Occupational therapists working throughout Africa, and especially those in rural settings, will greatly benefit from reading The POWER of WOMEN.



TITLE OF THE BOOK
How to listen so men will talk

AUTHOR
Tom Chapman

INFORMATION ON THE BOOK
Published by: Jonathan Ball Publishers and the Wellbeck Publishing Group
Publication date: May 2022
ISBN number paperback: 9781789562927
Available in: Paperback – ZAR 245.00
Number of pages: 182

INFORMATION ON THE REVIEWER
Reviewer: Naazneen Ebrahim,
ORCID 0000-0003-4182-9686
Affiliation: Head of department, Occupational Therapy, Tara the H Moross psychiatric hospital, Johannesburg, South Africa
Contact details: naazneen.ebrahim@gauteng.gov.za
Declaration of bias: The reviewer has no bias to declare. She has no affiliation with the publisher or the author.

HOW TO CITE THIS BOOK REVIEW
Ebrahim N. A review of: How to listen so men will talk written by Tom Chapman. South African Journal of Occupational Therapy. Vol 53 No2, August 2023.
DOI: https://doi.org/10.17159/2310-3833/2023/vol53n2a12

ARTICLE HISTORY
Submitted: October 2022
The book review was not peer reviewed
Accepted: November 2022
Published: August 2023

ISSN On-line 2310-3833

A review of: How to listen so men will talk written by Tom Chapman

Information on the author

Tom Chapman is a UK award winning barber, author, public speaker and international educator. After losing a friend to suicide, he embarked on a campaign to reduce the stigma surrounding male mental health and suicide prevention. In September 2015 he founded a group called the Lions Barber Collective (LBC), which is a group of international barbers raising awareness about suicide prevention and mental wellbeing. Tom Chapman believes that the barber's shop is a safe environment for men to talk, as barbers and hairdressers are in a unique position to listen to people. The LBC group helps to raise awareness of mental illness and aims to prevent suicide by creating training that enables barbers to recognise, talk and listen for symptoms of depression.

The Review

The book is an easy read, written in layman's English. The introduction speaks to understanding men's health, how men typically engage in the health system, gender biases and that it is important to note men do experience emotion as much as women do, although they are often reluctant to show their vulnerable side and may not appear to struggle. Mr Chapman highlights how barbers are well positioned to listen and observe, and how men will visit the barber more often in a year than their GP or other health professionals. In this sense, barbers can better establish rapport with their clients, and men are able to open up about feelings of loneliness, self-medication, relationships and substance use. The author founded an international group called the Lions Barber Collective (LBC), which focuses on raising awareness about suicide prevention and mental wellbeing. The book is based on the four-step training programme, created by the author, and inspired by the LBC's work. The reader is taken through the four steps chronologically. Each step is covered in a chapter and will guides the reader to:

- Recognise if someone is struggling with their mental health.
- Ask the right questions.
- Listen in an engaged and empathetic manner, with patience and without judgement.
- Help through guiding the person to the appropriate/ relevant resource.

Although the title of the book gives the impression that it is focused on men, the content is relatable to all genders and can extend beyond the barber shop. What I enjoyed about the book was that it was not just theory but also included activities and opportunities for the reader to reflect on how they are using a skill or how they may apply the skill to a specific person. The book does not specifically speak to occupational therapists, but it did, however, resonate with me as an occupational therapist working in a psychiatric hospital and is applicable to all health care professionals. The content was a reminder to me of how to actively listen and ask the right questions to get clients to open up. As I read the book, I reflected on how occupational therapists are viewed within the health system and how the occupational therapy space tends to be one that offers comfort and a safe space. As in a barbershop, this creates opportunities for our clients to open up, disclose difficult emotions and talk about their fears and future plans. It is not uncommon to find clients

who will disclose suicidal ideations, trauma experiences, self-harm, and even homicidal ideations, to their treating occupational therapists whom they see regularly and with whom they have developed a trusting relationship. I found myself thinking about adolescents, the high rates of bullying and suicide amongst teens and how this age group, in a way, is similar to men and their reluctance to seek help. As occupational therapists, we are resourceful and are often positioned to recommend that our clients seek the appropriate assistance, therapy or intervention. These are also the qualities promoted and described in this book.

For me, the content of the book is relevant to all health professionals and can be used across cultural contexts. It is especially relevant to clients' return to social contact. It serves as a reminder during times of increased stress, bullying and unemployment, to be mindful of those we engage with, so we are able to recognise, listen, ask for and offer help. Offering help does not mean we need to have the answers or that we will necessarily stop a negative outcome, but it may mean steering the person towards a service where they can benefit and gain support.

Another valuable aspect of the book is that it encourages readers to consider their own mental health and gives examples of ways to maintain mental health. Examples include connecting with others, engaging in physical activity, rest and sleep, continuous learning, giving, and participating in leisure pursuits. These are, after all, aspects that are considered by occupational therapists in managing clients and a reminder to occupational therapists and other health professionals to strive to maintain their own mental health.

I conclude with a quote from the book: If you are prepared to hold out a helping hand to a man who needs it, you will make a difference. Whether that is simply cheering their mood or letting them talk through and resolve a decision or guiding them to professional help for a serious mental health issue, all are equally valuable for the recipient of your support. At the most extreme your support could be saving a life. (Page 164)

The South African Journal of Occupational Therapy (SAJOT) is the official Journal of the Occupational Therapy Association of South Africa (OTASA) and is a leading publication for research into occupational therapy in Africa.

Find out more about the Occupational Therapy Association of South Africa (OTASA) at:
https://www.otasa.org.za/about-otasa/

The South African Journal of Occupational Therapy (SAJOT) publishes and disseminates research articles that contribute to the scientific knowledge of the profession and its outcomes with particular reference to service delivery in Africa. It provides a platform for debate about issues relevant to occupational therapy in Africa which will also contribute to the development of the profession worldwide. Wish to publish in the SAJOT? Go to
http://userguide.sajot.co.za/wp-content/uploads/2022/01/Guidelines-for-Publishing-in-the-South-African-Journal-of-Occupational-Therapy-Jan-2022-27.pdf

The South African Journal of Occupational Therapy (SAJOT) is seeking researchers, scholars, educators, and seasoned practitioners to be reviewers for the journal. Find out more about this call for reviewers at:
http://userguide.sajot.co.za/reviewers/call-for-reviewers/

To advertise in the South African Journal of Occupational Therapy (SAJOT) please contact El-lerisa at email **otoffice@otoffice.co.za** for information on advertising rates.

SOUTH AFRICAN JOURNAL OF OCCUPATIONAL THERAPY

VOLUME 53, NUMBER 2, AUGUST 2023, ISSN 0038-2337