

## FOOD HANDLING AND SAFETY PRACTICES OF CHILD AND YOUTH CARE WORKERS IN CHILD AND YOUTH CARE CENTRES, KWAZULU-NATAL, SOUTH AFRICA: IMPLICATIONS FOR GUIDELINE DEVELOPMENT

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### ABSTRACT

A study analysed the food handling and safety practices of Child and Youth Care Workers (CYCWs) in Child and Youth Care Centres (CYCCs) in KwaZulu-Natal, South Africa. The study involved nine respondents, both permanent and long-term contract employees, and questionnaires, observations, and microbial swabs were used to analyse Total Microbial Activity (TMA), *Escherichia coli*, *Staphylococcus aureus*, *coliforms*, and *Escherichia coli*. The results were used to develop comprehensive guidelines on hygiene, food handling, and food preparation.

The findings revealed that none of the respondents had received training in food safety, food preparation, food contamination, or personal hygiene, resulting in a lack of knowledge about the necessary procedures. Furthermore, no written guidelines, policies, or procedures place to assist with receiving, storing, serving, sanitising, and monitoring food products. Some workers did not wash their hands when preparing food, which increased the possibility of contamination. The lack of handwashing soap for children and youth sparked worries regarding hygiene practices.

The study identified a lack of education, training, information, and proper working guidelines as significant contributors to improper implementation of food preparation, handling, hygiene, and safety protocols. The urgent need for developing comprehensive training programs and guidelines is highlighted to improve food preparation, handling, and safety practices within these child and youth care centres.

### KEYWORDS

food safety, food preparation, food handling, child and youth care centres, child and youth care workers

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## INTRODUCTION

Globally, food safety has been a concern for most countries (Azanaw *et al.* 2021). World Health Organization (WHO 2015) reiterated that most foodborne diseases are associated with food preparation, such as using unsafe water, poor hygiene practices, inadequate food production and storage conditions, and low literacy, and low education levels. Unsafe food puts billions of people at risk (Fung *et al.* 2018). Microbial, chemical, personal, and environmental hygiene challenges are present throughout the food chain, extending from farm to fork or plate. About 420 000 individuals die every year due to unsafe food (WHO 2022). Despite concerted efforts by authorities to increase food safety, the problem remains a serious health concern for people in different countries, including South Africa (Ashkanani *et al.* 2021). Inadequate sanitary conditions and poor hygiene practices contribute to developing infectious diseases (diseases that spread from one person to another) (Vivas *et al.* 2010). Food service facilities are identified as the places most affected by bacterial, chemical, and personal hygiene issues (Fung *et al.* 2019). Failure to practice proper food handling, preparation, and feeding practices when caring for children can result in their contracting foodborne illnesses and ultimately, malnourishment (Bailey & Hedlund 2012; Scott 2003; Vinck 2013; World Food Program 2015). Factors such as cross-contamination from food contact surfaces, poor food safety, and improper handling procedures contribute to the increase in foodborne illnesses (Ashkanani *et al.* 2021; Fung *et al.* 2018). Since food is necessary for survival, food safety constitutes a fundamental human right.

Annually, millions of people get sick due to foodborne diseases and thousands eventually lose their lives (Fung *et al.* 2018). In the past, deliberate or unintentional individual behaviour and the SA government's failure to enhance food quality and safety have resulted in documented human tragedies and economic disasters related to the consumption of contaminated food (Fung *et al.* 2018). According to Käferstein and Abdussalam (1999), unsafe handling of food in the kitchen can result in the emergence of foodborne illnesses. The authors found that most food handlers do not completely comprehend the importance of food safety, especially those in food service facilities. Meanwhile, poor personal hygiene, sanitation, inadequate cooking, long-term storage in unhygienic facilities, and cross-contamination have been outlined as the primary factors contributing to the increase in unsafe food in different food service facilities more especially by untrained food handlers (Mjoka & Selepe 2017; Osaili *et al.* 2018).

Child and youth care workers (CYCWs) should be educated and informed on their roles and responsibilities, which include providing healthcare to at-risk children (Barford and Whelton 2010), which means that failure to practice good nutrition and proper food handling, preparation, and feeding practices when caring for children can lead to foodborne illnesses and, ultimately, malnutrition (Ogut, Ellis, Rodriguez, Caruso, McClintic, Ventura, Arriola, Kowalski, Linabarger, Wodnik & Webb-Girard 2022). The purpose of this study was to evaluate food handling by child and youth care workers (CYCWs) in Child and Youth Care Centres (CYCCs) in KwaZulu-Natal, South Africa, in order to inform the development of guidelines for personal hygiene, food handling, and food preparation. The study is focused on Sustainable Development Goal (SDG) 3 (Good Health and Well-Being), as learning about food hygiene, handling, and preparation in CYCCs requires significant critical attention

(Grobbelaar & Napier 2014; Napier *et al.* 2021). One of the most significant, current discussions on this subject is that there is a need to improve food safety, nutritional and hygiene practices in residential care facilities and CYCCs, in South Africa (Grobbelaar & Napier 2014). The recognition that CYCWs lack proper food handling, food preparation and hygiene practices reveals a knowledge gap that this study seeks to cover in terms of food handling practices, nutritional value and food safety. This pilot study was set to investigate the food safety and hygiene practices of child and youth care workers and the findings supported the development of guidelines for CYCWs. These guidelines will contribute to safe food preparation, nutritional knowledge and balanced meal presentation for children in CYCCs. Proper food handling practices, combined with CYCW nutrition knowledge, can be used as an effective tool to care for affected children who are at risk of low birth weight, malnutrition, failure to breastfeed, overcrowding, unsafe drinking water and food, and poor hygiene practices (WHO 2023) as a strategy to improve their quality of life in accordance with SDG 3 (Good Health and Well-being).

## METHODS

### Study area

A purposive sampling method was used, which is a type of non-probability, or non-random sampling in which respondents who met the criteria of easy accessibility, geographical proximity, availability at a given time, or willingness to participate in the study were recruited (Berndt 2020). Two CYCCs were selected based on their easy accessibility, considering road infrastructure and the distance to be travelled for data collection. Each CYCC had a central kitchen and dining area with a handwashing basin and several rooms that could accommodate

between 28 and 90 children and youths.

### Research instruments

This study used various data collection techniques, including surveys, observations, and swabs. Questionnaires developed by Meaker 2008 and Whati *et al.* (2005) were adjusted and used to collect the quantitative data. The researcher distributed three sets of questionnaires to the respondents (two managers' questionnaires, seven food handlers' questionnaires, and nine nutrition knowledge questionnaires [NKQ]). The study used triangulation of methods, which entailed self-administration and along with one-on-one (three) setting administration where respondents could not read or write, completion of the questionnaire that was written in English (translated to IsiZulu), and observation of the food handling practices in the two kitchens. Daily activities, such as food handling, preparation, and safety in both CYCCs, were observed and documented in the observation checklist on two different days. Direct observation was used to observe the respondents without communicating or interacting with them. Activities taking place in the kitchen, such as pre-preparation, preparation, plating, and serving of food, the use of storerooms, and the storage of the food were observed and recorded. A trained researcher collected samples from the surfaces that were in contact with food and hands, using a sterile cotton swab, whereas water samples were taken using a sterile bottle. Samples were sent to the laboratory for microbiological analysis (Mérieux NutriSciences 2022).

### Data analysis

After collecting all the completed questionnaires (managers, food handlers and NKQ), data were screened for errors prior to analysis. The data were then entered into an Excel spreadsheet, which was analysed to

generate descriptive statistics for the small sample size of two (n=2) Child and Youth Care Managers (CYCMs) and seven (n=7) CYCWs. The observed activities (checklist – n=2) information was screened and entered into an Excel spreadsheet. The results were reported in a table that outlined the variables observed and the number of observations conducted.

The surface samples for Total Microbial Activity (TMA) hand samples were analysed for *Escherichia coli* and *Staphylococcus aureus*, while water samples were analysed for Total Microbial Activity (TMA), coliforms, and *Escherichia coli*, all by an accredited laboratory.

### Ethical considerations

This study prioritised ethical principles (IREC No: 076/15) by obtaining informed consent, ensuring voluntary participation, and assuring confidentiality. No financial incentives were provided, and no costs were incurred by participants. Rigorous measures were taken to mitigate risks by excluding the children

residing in the CYCC from the study. Participants had the right to withdraw without the fear of any negative consequences. Upholding these ethical standards enhanced the study's integrity and protected respondents' well-being.

## FINDINGS

### Demographic characteristics of the respondents

The study included a total of nine (n=9) CYCWs. Three respondents (33.3%) had no education. None of the respondents had a residential care qualification or had completed any of the NACCW's short courses. Years of experience as child and youth care workers ranged from one year (n=2; 22.2%) to more than five years (n=4; 44.4%) (Table 1).

### Child and youth care centres infrastructure (water, electricity and gas): CYCCs

The infrastructure at CYCCs, which included supply and administration, provided for access

**TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS: CYCMs AND CYCWs**

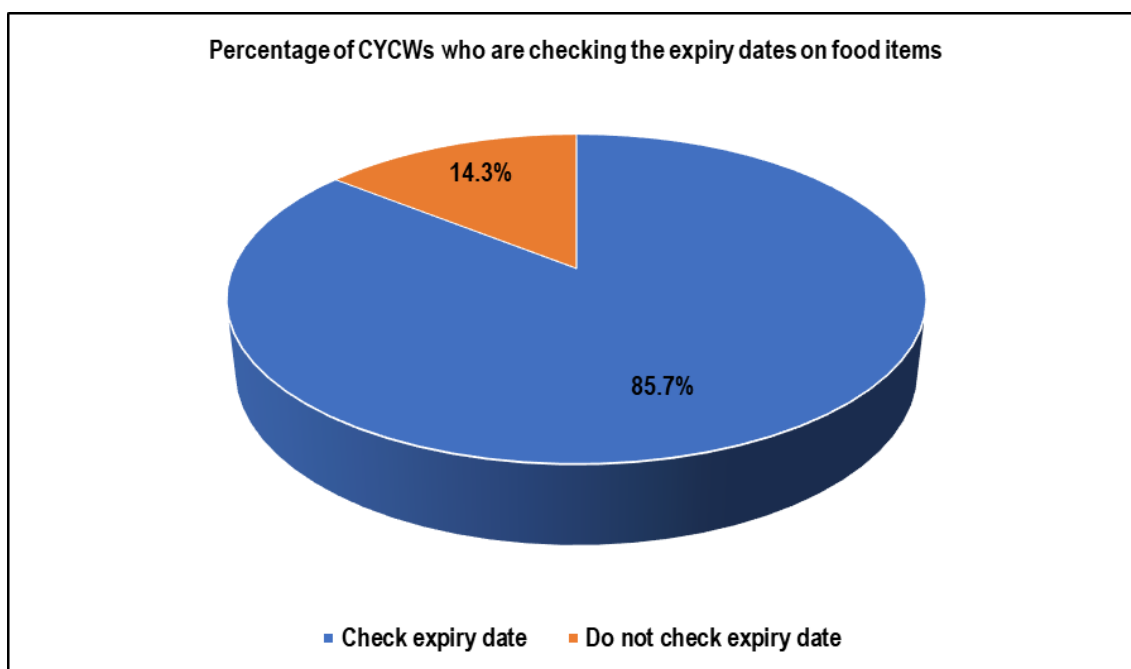
Variables	Managers, food handlers, and NKQ data	
	Numbers (n=9)	Percentage (100%)
<b>EDUCATION LEVEL</b>		
No education	3	33.3
Entered high school	1	11.1
High school graduate	3	33.3
Completed some college education	0	0.0
Associated Degree in CYC-related qualification	0	0.0
Other	0	0.0
<b>JOB POSITION IN CYC</b>		
Manager	2	22.2
Coordinator	1	11.1
Food handler (cook)	3	33.3
<b>Caregiver</b>	3	33.3
Volunteer	0	0
<b>EXPERIENCE (LENGTH OF SERVICE IN CYC)</b>		
0-2 years	2	22.2
3-4 years	3	33.3
5 and more years	4	44.4

**TABLE 2: THE INFRASTRUCTURE AT CYCCs**

Infrastructure in the CYCCs	
Variable	Positive responses
>	2 (100%)
Access to water outside the kitchen	1 (50%)
Access to hot water	2 (100%)
Access to electricity	2 (100%)
Alternative energy supply (Gas)	2 (100%)

**TABLE 3: POLICIES AND PROCEDURES ON RECEIVING, STORAGE, SERVING, HYGIENE, ADMINISTRATION, AND MENU PLANNING IN THE FACILITIES**

Written policies and procedures for food receiving, storage, serving, and administration	
Variable	Positive responses
Written policy on receiving, storage, serving, and hygiene	2 (100%)
Menu planning	1 (50%)



**FIGURE 1: PERCENTAGE OF CYCWs CHECKING THE EXPIRY DATES ON FOOD IN THE CYCCs**

to running water. Municipal taps were installed in the kitchens and outside of each CYCC. Kitchen sinks had hot and cold water that was used mainly for meal preparation and dishwashing. During days when the municipal water supply was turned off, water was drawn from an external backup tank filled with rainwater. The CYCCs used electricity as the main source of energy for food preparation, with gas as an alternative during load shedding.

**Policies and procedures on receiving, storage, serving, hygiene and administration, and menu planning**

Table 3 shows that there were no official or documented policies and procedures in place at the CYCCs for receiving, processing, serving, hygiene and administration, or for menu planning. Suppliers had informally agreed on basic supplies such as bread and milk that require frequent delivery. The one

CYCC had a written menu with nutritious items including oats, fruits, and vegetables. However, the menu was not followed consistently.

### Checking food expiration dates and storing food in CYCCs: CYCCWs

The respondents checking of the food expiry date of food. Six (85.7%) of the respondents checked the expiry dates on food products before cooking or consuming them, while three (14.3%) did not (Figure 1).

### Food preparation practices in the CYCCs

In terms of food preparation practices, the results displayed in Table 5 show that food was produced in a distinct kitchen. The data also revealed that the primary personnel responsible for meal preparation were three (60.0%) cooks, one (20.0%) caregiver, and one (20.0%) CYCCs. Most respondents (n=6; 85.7%) perceived the kitchen space to be acceptable, while five (71.2%) thought that the cooking equipment was adequate. Three

(42.8%) respondents indicated that they had access to chopping boards, while one (14.3%) reported having access to measuring equipment. Seven (100%) respondents stated that the CYCCs lacked recipes.

### Observation of the storage facilities

As stated in Table 5, perishable foods were stored in a cold room/fridge, whereas non-perishable products were stored in a separate room in the CYCCs. Cleaning supplies (50% of the CYCCs) were stored with food. The storerooms at the CYCCs were locked. Only one (50%) storeroom was found to have sufficient lighting and storage space. Food was delivered to CYCCs in its original containers, with products accurately branded and an expiry date printed on them. Storage containers in the CYCCs were not labelled with food expiry dates. Food containers were covered. During the observation, no cold, stale, or spoiled food was identified.

The storage facility at one CYCC was found to be filthy and disorganised. In the storeroom,

**TABLE 4: FOOD PREPARATION PRACTICES IN THE CYCCs: CYCCWs RESPONSES**

Variables	n=7 (Percentage)
<b>PLACE WHERE FOOD IS PREPARED</b>	
Designated kitchen	7 (100%)
<b>THE PERSON PREPARING THE FOOD (N=5)</b>	
Cooks	3 (60.0%)
Manager	1 (20.0%)
Caregivers	1 (20.0%)
<b>ADEQUATE SPACE FOR FOOD PREPARATION</b>	
Yes	6 (85.7%)
<b>AVAILABILITY OF COOKING UTENSILS (KNIVES)</b>	
Yes	5 (71.2%)
<b>AVAILABILITY OF CHOPPING BOARDS IN THE CYCCs</b>	
Yes	3 (42.8%)
<b>AVAILABILITY OF MEASURING EQUIPMENT</b>	
Yes	1 (14.3%)
<b>AVAILABILITY OF SPOONS</b>	
Yes	3 (42.8%)
<b>AVAILABILITY OF MIXING BOWLS</b>	
Yes	3 (42.8%)
<b>AVAILABILITY OF RECIPES</b>	
Yes	0 (100%)

**TABLE 5: OBSERVATIONAL FINDINGS OF THE RESEARCH WITH REGARD TO STORAGE FACILITIES**

Variables	Positive Observations n=2 (%)
Storage of perishable food in a cold room/fridge	2 (100%)
Storage of non-perishable food in a separate room	2 (100%)
Storage of cleaning materials with food	1 (50%)
Locking of storage room	2 (100%)
Proper storage room lighting	1 (50%)
Adequate space in the storage area	0 (100%)
Food stored in original packaging	2 (100%)
Labelling of products stored in the storeroom	2 (100%)
Food items with expiry dates	2 (100%)
Food that had passed the expiry date	1 (50%)
Labelling of expiry date onto products that are transferred to a storage container	0 (50%)
Utilisation of expired food items	0 (50%)
The covering of all containers in the storeroom	2 (100%)
Stale food items observed	0 (100%)
Evidence of decayed fresh produce	0 (100%)
Cleanliness of the storage areas	1 (50%)
Arrangement of the storage areas	1 (50%)
Food stored on the floor	1 (50%)
Stock sheets availability	0 (100%)
Application of the FIFO storage method (usage of old stock before using newly arrived stock)	2 (100%)
Evidence of pest (rodents/ insects) infestation	0 (100%)
Unpleasant odours in the storage areas	1 (50%)

the researchers found that food was stored directly on the floor. Further, food was distributed without a completed stock sheet being used. The CYCCs adopted the first expired, first out (FEFO) strategy for issuing and utilising the stock. There was also no evidence of pest infestation (rodents/insects) in the CYCCs and there was no evidence of flies in the kitchen or storeroom. However, there was an unpleasant aroma in the food storage area.

**The observation of food preparation, food serving and wastage**

Table 6 shows that there was enough space for food preparation and serving in the two (100%) CYCCs. Further, Table 6 shows that the respondents did not implement recipe standardisation since recipes were not available or displayed in the kitchen. The internal temperature of the food was also not

checked. The researchers observed that the CYCCs had easy access to water for cooking.

Both the CYCCs had a limited amount of food serving utensils for dining (100%). All of the food prepared for the day had been served, and there was no food left over. The children and youths all finished their meals. There were covered trash bins in the CYCCs, but one (50%) of them had not been cleaned.

**Observation of personal and kitchen hygiene practices by cooks, children, and youths**

According to Table 6, only one CYCC had the necessary cleaning supplies such as chemicals and cloths, scourers, and sponges. There were some utensils, equipment, and workstations that were not clean. In the CYCCs, clean-as-you-go (a method for reducing hygiene, health, and safety hazards)

**TABLE 6: OBSERVATIONAL FINDINGS OF FOOD PREPARATION, FOOD SERVING AND WASTAGE**

Variables	Positive observations n=2 (%)
<b>FOOD PREPARATION</b>	
Enough space for food preparation	2 (100%)
Space for serving/portioning	2 (100%)
Recipes	1 (50%)
Standardisation of existing recipes	0 (100%)
Checking the food's internal temperature	0 (100%)
Availability of water for cooking	2 (100%)
<b>SERVING OF FOOD AND FOOD WASTE</b>	
Sufficient food serving utensils	1 (50%)
Sufficient eating utensils	1 (50%)
Portion size standardization	0 (100%)
Serving of the prepared/cooked food	2 (100%)
Leftover food management	0 (100%)
Children and youth finished their meals on their plates	2 (100%)
Leftover food that had been thrown away from a plate	0 (100%)
Designated rubbish bins	2 (100%)
Covering of rubbish bins	2 (100%)
Cleaning of the rubbish bins	1 (50%)
Waste lying outside the rubbish bins	0 (100%)

**TABLE 7: OBSERVATIONAL FINDINGS ON HYGIENE CONCERNING COOKS, CHILDREN AND YOUTHS**

Variables	Positive Observations n=2 (%)
<b>HYGIENE</b>	
Cleanliness of the kitchen utensils	1 (50%)
Cleanliness of the kitchen equipment	1 (50%)
Use of correct cleaning chemicals	1 (50%)
Availability of cleaning supplies: cloths, scourers, sponges, etc.	1 (50%)
Cleanliness of the work area	2 (100%)
Cleaning of the food preparation area frequently	2 (100%)
Availability of water for cleaning	2 (100%)
Washing of hands by cooks	1 (50%)
Availability of handwashing soap	1 (50%)
Cleanliness of food handlers' uniforms	1 (50%)
Washing of hands by servers before serving the food	1 (50%)
Washing of hands by children and youths before eating	2 (100%)

was employed only infrequently during food preparation. The CYCCs' kitchens were provided with both hot and cold running water from taps in the kitchen area. However, only one CYCC staff member was seen washing their hands routinely during food preparation. Children and youths did not have soap for

handwashing. The food handlers' uniforms appear not to be clean. Before serving the food to the children and youths, food service personnel from both the CYCCs did not wash their hands. Meanwhile, children and youths in the CYCCs were seen washing their hands before consuming the food, even though



some did not use hand soap.

### **Training for CYCMs and CYCWs on food safety**

According to the CYCMs and CYCWs, they had not been trained in food safety, menu planning, food preparation, food handling, or personal hygiene to enhance food safety.

### **Microbiological results of work surfaces, equipment, and food handlers' hands**

Using the SWJM 35 technique, surface swabs were tested for Total Microbial Activity (TMA). The results showed that one CYCC had 10 colony-forming units (cfu) per area while the other had 40. This indicates that, when comparing the acceptable parameter per surface, one of the CYCCs reported cfu to be significantly low, while the other cfu was in the middle of the acceptable standard but still within the acceptable range. According to the guidelines, less than 100 TMA cfu per swab area parameter is acceptable, (Mérieux NutriSciences 2022).

The South African Bureau of Standards (SABS) recommends 15 cfu/1000 mm<sup>2</sup>, while Swift Silliker, a Mérieux Nutrisciences Company, approved a value of 71-99 cfu/10 cm<sup>2</sup> (Mérieux Nutrisciences 2022:2). The samples were collected from the hands of the three food handlers who prepared the food in the kitchens and were tested for *Escherichia coli* (*E.coli*) and *Staphylococcus*. The results revealed that none of the food handlers tested positive for cfu/area development in the hands. That is, the food handlers' hands met all of the acceptable standards for clean hands. Since there was no growth, no figure for this particular test was displayed in the growth results.

The results of the water swabs showed that the samples collected had less than 100 TMA. In one CYCC, a count of approximately 60

cfu/ml was reported, as well as a coliform count of 57, which was greater than the legally acceptable limit of 10 or less per 100 ml. When tested, the activity level of *E.coli* did not proliferate (CYCC 2). Meanwhile, growth of TMA in a cfu/ml, coliforms in a cfu/100, or *Escherichia coli* in a cfu/100ml was also inactive in the CYCC results. As a result, it can be concluded that the water in one of the CYCCs was safe for consumption, whereas the coliform count in CYCC 2 was slightly higher than expected.

### **DISCUSSION**

The purpose of this study was to assess the food handling and safety practices of CYCWs in the CYCCs. The combination of these findings provides support to the hypothesis that there is a need to strengthen CYCW education, training, and food safety practices. The study also identified several areas for improvement, and the results provided helpful information for inclusion in guidelines that would be specifically customised for CYCWs to meet the requirements of the children and youth. One-third (33.3%) had no formal education, and only two (22.2%) held a postgraduate degree. The current study's results are congruent with Berejena and Kleynhans (2020) and those of Grobbelaar and Napier (2014), who investigated the profile, nutrition knowledge, food safety, and hygiene practices of child and youth care workers (CYCWs) in residential care settings in Durban, South Africa. The goal of that study was to help contribute to the development of a guide to food preparation and nutrition guidelines. According to the findings, very few individuals had obtained a relevant tertiary certification, and there was concern regarding food safety because food safety practices were not always evident. Other research has highlighted that food handlers' lack of education may jeopardise food safety and hygiene practices, potentially exposing them

to microbiological or chemical contamination risks (Allam *et al.* 2016; Lee *et al.* 2017).

South Africa is prone to foodborne epidemics that primarily impact children, but there are insufficient resources to trace all such cases (Khuluse & Deen 2020). The findings from the respondents' work experiences demonstrated the necessity for intervention measures such as the training of CYCWs to improve their awareness of food safety practices. The results of this study revealed that only four (44.4%) of the respondents had more than five years of work experience in child and youth care. The research also reveals that none of the respondents from the two CYCCs had been trained in food safety and hygiene. Hence, it could conceivably be hypothesised that their experience could be supplemented by the NACOSA Training Institute course programme, which could then ensure a professional appointment according to their recognised skills (NACOSA Training Institute 2016). The results of this study provided further support for the hypothesis that to be effective in any situation, people working with vulnerable children must be able to promote and support the optimal development of such children and young people (youths) with both normal and exceptional developmental needs (NACOSA Training Institute 2016).

Limited food safety knowledge among food handlers/CYCCWs can lead to cross-contamination and food borne illness as hands carry bacterial contamination (Lambrechts *et al.* 2014; Lee *et al.* 2017). The respondents who participated in the study (n=9) reported that no one had received training in food safety, menu planning, food preparation, food contamination, and personal hygiene. Several studies have identified food handling as the main vector of microorganisms (Assefa *et al.* 2019; Honua 2018; Rossi *et al.* 2018). Poor personal hygiene of food handlers is acknowledged as a potential source of infection because of pathogenic bacteria. Knowledge is essential

for influencing food handlers' food handling practices (Alemayehu *et al.* 2021). Furthermore, in a study conducted by Alemayehu *et al.* 2021, good handling practice was linked to good food safety knowledge, whereas individuals with insufficient knowledge were found to lack the ability to implement proper food handling practices. This notion is also supported by a study conducted by Nasrolahei *et al.* (2017) in Sari, northern Iran, that was designed to determine the prevalence of bacterial infestation among the food handlers attending the public health care centre laboratory for annual check-ups.

The results of Nasrolahei *et al.*'s (2017) study indicated that, of the 220 food handlers, 62,2% (n=137) carried some pathogenic bacteria, including *S.aureus*, *P.aeruginosa* and *S.boydii* under their fingernails. Similarly, Uyttendaele *et al.* (2016) noted that food safety is a worldwide health concern that affects many industrialised nations, resulting in foodborne illnesses that have a negative impact on health and the economy. As a result, food handlers' work experience in terms of hygiene and food safety is critical. Contrary to expectations, this study found that, in one of the CYCCs, there was no soap for hand washing for either the children or the food handlers. Extant literature shows that hands are a common way of spreading germs (WHO 2015). Moreover, hand washing with soap is the most effective method to minimise the occurrence of contaminants such as *Enterococcus SPP* (Burton *et al.* 2011).

According to the safe food handling procedures protocols, the Foodstuffs, Cosmetics, and Disinfectants Act 54 of 1972), all food products, including labelling, must comply with its regulations (DoH 2013). Surprisingly, none of the CYCCs had documented policies or guidelines for receiving, storing, serving, sanitising, or managing food products. Before preparing or utilising the food, most of the six respondents (85.7%) checked the expiration date on the

food label.

A service level agreement (SLA) is an approach for developing a common understanding of the service to be given between a service provider and the customer. Communication is also essential for managing expectations, clarifying roles, and establishing objectives for measuring effectiveness (Krych-Appelbaum *et al.* 2007). SLAs were verbally agreed upon with a community member in this study for the supply of fresh milk to one of the CYCCs. Other food items were purchased at a nearby supermarket and delivered by CYCCMs. Food waste as a result of improper food handling is a challenge for CYCCs. Food deemed unsafe for human consumption was received and discarded, according to one of the CYCCMs. The findings of this study concur with those of Cronjé *et al.* (2018), who found that 61% of food was thrown away. This conclusion confirms Lipinski *et al.*'s (2013) findings that food waste has an economic and environmental impact.

At least two billion people worldwide do not have access to safe drinking water (United Nations 2023). Water contamination and inadequate sanitation have been linked to the spread of diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid, and polio (WHO 2020). Omotayo *et al.* (2019) reported that tap water, either off-site or on-site, was commonly available to households in South Africa, with 98.5% in the Western Cape, 97.6% in Gauteng, 85.4% in KwaZulu-Natal, and 94% in the Northern Cape, with Limpopo (70.0%) and the Eastern Cape (73.9%). During the same period (2019), the percentage of households with off-site or on-site tap water increased by 3.8% points nationally. These figures on the availability of water to South African households are consistent with the results of the present study in terms of the availability of drinking water and water used to clean utensils in the CYCCs. Seven (100%) of the respondents

claimed to have water available to them. This was the case even though South Africa is considered a water-scarce country (Donnenfeld *et al.* 2018; Mpongwana *et al.* 2022). The drinking water sample from one of the CYCCs contained 57 coliform bacteria and was therefore unsafe for consumption. Toxins in drinking water are a concern, particularly for the elderly and children suffering from diseases such as HIV and AIDS, who can be severely affected by toxins in drinking water (SA, Department of Water Affairs and Forests 2005). Water is key to household food security, and it is a basic human need required for food preparation, processing, and production (Selepe *et al.* 2015).

## IMPLICATIONS OF THE STUDY

The study is unique in that it is based on issues of food safety, handling, preparation and nutrition standards for children, and safe food handling methods and preparation of the CYCWs in the CYCCs. The study will be used to guide the process of developing guidelines on proper menu planning, the preparation and serving of nutritious foods, as well as the safe handling and preparation of food. One of the study's findings was that the food receiving, storage, serving, hygiene, administration, and menu planning at the CYCCs were not governed by any defined policy or guidelines. The researchers will lobby the Department of Social Development (DSD) to support the CYCCs by means of providing guidelines or training on food handling and safety practices. The intention is to contribute to safe food preparation and adequate meal presentation to children and youth in CYCCs by providing information based on identified gaps in the knowledge and the behaviour of CYCWs.

## Limitations

A limitation of the study was that the researchers used only two CYCCs, based on

their accessibility. The study focused only on CYCCs situated within the Ulundi cluster. While the results cannot be generalised, as per provisions of trustworthiness, particularly the transferability criterion, they can be transferable to contexts of a similar nature.

## CONCLUSION

In the absence of information or a working protocol to advise CYCWs on how to successfully enforce safe food preparation, hygiene, and safety, the overall findings revealed a need for child nutrition, food preparation, food safety, and healthy eating guidelines. As a result, guidelines for relevant proper nutrition, such as safe food preparation, hygiene, and safety and nutrition, should be developed based on the study's findings and relevant literature. The guidelines should enhance CYCWs' self-efficacy in planning and preparing healthy menus and meals for the children and youths who reside in those facilities. The results of the research study support the need for the development of child nutrition, food preparation, food safety, and healthy eating guidelines for children aged 5-18 years.

A more comprehensive investigation of nutrition, food safety, and hygiene practices in CYCCs is suggested in order to acquire a better knowledge of the practices and provide guidelines for nutrition, food preparation, safety, and hygiene. The research can also help to design or serve as a guide for good menu planning, the preparation and serving of healthy foods, as well as the safe handling and preparation of food guidelines for use in CYCCs. The researcher can utilise the findings to persuade the DSD to adopt child nutrition, food preparation, food safety, and healthy eating guidelines, which can then be used as guidance to design and educate CYCWs to provide safe and nutritious meals to children and youth in CYCCs. Although the study that helped generate child nutrition, food

preparation, food safety, and healthy eating standards was conducted in KwaZulu-Natal, the guidelines contain information that can be applied in other South African provinces and elsewhere.

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