

REVIEW ARTICLE

Mental health needs among pregnant and parenting adolescent girls and young women in South Africa: A scoping review

DOI: 10.29063/ajrh2023/v27i2.11

Linneth N. Mabila^{1*}, Livhuwani Muthelo², Masenyani O. Mbombi², Peter M. Mphekgwana³, Reneilwe G. Mashaba⁴, Cairo B. Ntimana⁴, Kagiso P. Seakamela⁴, Joseph Tlouyamma⁵, Inos Dhau⁶, Rathani Nemuramba⁴, Katlego Mothapo⁴ and Eric Maimela⁷

Department of Pharmacy, Faculty of Health Sciences, Polokwane, South Africa¹; Department of Nursing Science, University of Limpopo, Polokwane, South Africa²; Research Administration and Development, University of Limpopo, Polokwane, South Africa³; DIMAMO Population Health Research Centre, University of Limpopo, Polokwane, South Africa⁴; Department of Computer Science, University of Limpopo, Polokwane, South Africa⁵; Department of Geography and Environmental Studies, University of Limpopo, Polokwane, South Africa⁶; Department of Public Health, University of Limpopo, Polokwane, South Africa⁷

*For Correspondence: Email: nkateko.mabila@ul.ac.za; Phone: +2715 268 2356/3295

Abstract

Teenage pregnancy and parenting pose a greater risk of developing mental health problems among pregnant and parenting adolescent girls and young women. We report on a scoping review of peer-reviewed articles to identify mental health needs and challenges among pregnant and parenting adolescent girls and young women. We adopted only five steps of the Arksey and O'Malley framework to facilitate the scoping review of 125 articles published between July 2002 and August 2022 from these databases (MEDLINE, SABINET, EBSCOhost, Science Direct) using search syntax. Major themes emerged from the thematic content analysis; challenges experienced by pregnant and parenting adolescent girls and young women and the recommended interventions, factors associated with mental health in pregnant women and parenting adolescent girls and young women, and the implications of mental health problems. Mental health challenges, among others, include depression, stress and anxiety, post-traumatic stress disorders, and suicidal thoughts. Limited mental health interventions are provided to the group, including social support, parental coaching and counselling, and guidance, which translates to an imbalance between targeted mental health interventions and mental health challenges. We recommend involvement and education of the community on social support, development of digital health programs and integration of mental health services amongst schools, clinics, and community development to support pregnant and parenting adolescent girls and young women. (*Afr J Reprod Health* 2023; 27 [2]: 101-129).

Keywords: Pregnant adolescents, adolescent mothers, mental health needs

Résumé

La grossesse et la parentalité chez les adolescentes présentent un risque accru de développer des problèmes de santé mentale chez les adolescentes et les jeunes femmes enceintes et parentales. Nous rendons compte d'un examen de la portée d'articles évalués par des pairs pour identifier les besoins et les défis en matière de santé mentale chez les adolescentes et les jeunes femmes enceintes et parentales. Nous avons adopté seulement cinq étapes du cadre d'Arksey et O'Malley pour faciliter l'examen de la portée de 125 articles publiés entre juillet 2002 et août 2022 à partir de ces bases de données (MEDLINE, SABINET, EBSCOhost, Science Direct) en utilisant la syntaxe de recherche. Des thèmes majeurs ont émergé de l'analyse du contenu thématique ; défis rencontrés par les adolescentes et les jeunes femmes enceintes et parentales et les interventions recommandées, les facteurs associés à la santé mentale chez les femmes enceintes et les adolescentes et les jeunes femmes parentales, et les implications des problèmes de santé mentale. Les problèmes de santé mentale, entre autres, comprennent la dépression, le stress et l'anxiété, les troubles de stress post-traumatique et les pensées suicidaires. Des interventions limitées en santé mentale sont fournies au groupe, y compris un soutien social, un encadrement et des conseils parentaux et des conseils, ce qui se traduit par un déséquilibre entre les interventions ciblées en santé mentale et les problèmes de santé mentale. Nous recommandons l'implication et l'éducation de la communauté sur le soutien social, le développement de programmes de santé numérique et l'intégration des services de santé mentale dans les écoles, les cliniques et le développement communautaire pour soutenir les adolescentes et les jeunes femmes enceintes et parentales. (*Afr J Reprod Health* 2023; 27 [2]: 101-129).

Mots-clés: Adolescentes enceintes, mères adolescentes, besoins en santé mentale

Introduction

Adolescent pregnancy is a significant global public health problem in high, middle-and low-income countries¹⁻³. Adolescent pregnancies are more likely to occur in marginalised communities, with social difficulties commonly driven by a lack of education, employment opportunities, and poverty¹⁻³. Approximately 16 million girls aged 15 to 19 and 2 million girls under 15 give birth yearly, accounting for 11% of births worldwide⁴. In developing countries, 12 million girls aged 15–19 years and at least 777,000 girls under 15 years give birth yearly⁵.

Adolescent mothers aged 17 years and younger in South Africa (SA) accounted for approximately 33 899 births in 2020. In addition, over 600 adolescents aged 10-13 years (including late birth registrations) gave birth in 2020⁶⁻⁸. Maternal complications associated with early pregnancy and motherhood result in babies' low survival rates⁹. In 2021, the SA parliament was concerned about the pregnancy rate amongst adolescent school girls, which was reported to 'remain unacceptably high, with more than 36,000 babies delivered to girls aged 10 to 19 in the first quarter of 2021'^{7,8}. It cannot be overlooked that these adolescent girls are still in the developing stage. Therefore, the incidence of early pregnancy and motherhood forces many adolescent girls to prematurely take on an adult role which they are not emotionally or physically prepared for^{6,10}.

Adolescent pregnancy is a serious problem that has worsened over the past five years in all provinces and every year¹¹. Adolescents aged 10-19 represent a significant proportion of the population at 17.4%, contributing to 2.1% of the total mortality¹¹. The health and well-being of adolescents are of particular importance in society as they represent the future workforce and contributors to potential economic productivity. Adolescence is a crucial period associated with multiple factors that affect mental health⁹. While mental health has gained recognition as a significant public health concern, pregnant and parenting adolescent girls and young women are at greater risk for developing mental health problems during pregnancy and after birth. This is due to three main reasons: Adolescence is a transitional stage characterized by biological, psychological,

and social changes; pregnancy and parenting interfere with normative developmental processes, and the dual biological transitions of adolescence and pregnancy may increase individuals' mental and physical vulnerability^{12-14,52}.

The responsibilities and demands of parenting, lack of knowledge about child development and social support for pregnant and parenting adolescent girls and young women are associated with high stress, depression, and anxiety. These adversely affect the pregnancy and negatively influence future relationships between the mother and her baby¹⁵. Mental health problems adversely affect adolescent mothers' functioning and parenting behaviour and increase the risk of behavioural issues in their offspring¹². Therefore, the question is, what are the available services to address the mental health needs of adolescents during pregnancy and parenting?

As a consequence of adolescent pregnancy, pregnant teenagers experience mental health challenges⁹. Several studies also noted that adolescent girls and young women (AGYW) might experience mental health associated, with sexual and reproductive health, including pregnancy^{16,17}. Additionally, a study by DUBY *et al*¹⁶ indicated that the AGYW face various problems. According to WHO (2021)¹⁸, approximately 3.6% of adolescents aged 10 to 14 years and 4.6% aged 15 to 19-year-olds experience an anxiety disorder, while about 1.1% of adolescents aged 10-14 years and 2.8% of 15-19-year-olds experience depression¹⁸.

Studies show that Adolescent mothers experience higher rates of depression, both prenatally and postpartum, than non-pregnant adolescents and adult mothers. In addition, the rate of depression in adolescent mothers is estimated to be between 16% and 44%, and the rate of depression among non-pregnant adolescents and adult women ranges between 5% and 20%¹². Furthermore, literature revealed a gap in mental health service use among pregnant and parenting adolescent girls and young women^{12,16,52}. Further, there is limited data on mental health service use among low-income pregnant and parenting adolescents, especially in families from different cultural backgrounds¹². Additionally, DUBY *et al.*¹⁶ emphasise that mental health issues are defined differently across settings and socio-cultural contexts. They further argued that mental health

interventions are needed and should be contextually relevant to this population¹⁹ because implications of mental health problems among pregnant and parenting adolescents increase vulnerability to mental health and sexual and reproductive health problems. Therefore, this suggests that pregnant and parenting adolescents face substantial barriers to accessing mental health services to meet their needs. Hence this review aims to identify the gaps in addressing mental health needs among adolescent mothers in SA.

Aim and objectives

This study aimed to conduct a scoping review of the peer-reviewed literature to identify mental health needs and challenges amongst pregnant and parenting adolescent girls and young women aged 10 to 30 years. The pursuing research queries were looked into:

- What mental health challenges are experienced by pregnant and parenting adolescent mothers?
- What are the implications of mental health problems among pregnant adolescents and parenting mothers?
- What are the available interventions/strategies to address mental health problems amongst pregnant adolescents and mothers?

Methods

A scoping review methodology was chosen to synthesize knowledge by identifying key research concepts, gaps, and evidence to inform research in health practice and policymaking²⁰⁻²². Additionally, scoping reviews utilize rigorous methods to identify and analyze relevant research²³ from heterogeneous and methodologically diverse pieces of evidence. This study used a systematic approach to review and synthesize literature about gaps in the literature addressing mental health needs and interventions thereof amongst pregnant and parenting adolescents in SA. We adopted only five of the six steps of the Arksey and O'Malley²² framework to achieve the study purpose.

Step 1: Identifying the research question

Although there is vast global literature regarding the mental health needs of pregnant and parenting

adolescents, we noted few studies conducted in South Africa to address the socio-economic and health challenges among pregnant and parenting adolescents. The main review question was, '*What are the gaps and interventions in addressing the mental health needs of pregnant and parenting adolescents in South Africa?*'

The abstract screening was done to refine and consistently apply the inclusion and exclusion Levac *et al.*²⁰, based on the scoping review aims and objectives. A review team of ten reviewers experienced in quantitative and qualitative research jointly reviewed 122 articles that met the inclusion criteria. The team screened all titles and abstracts, which were recorded on the excel spreadsheet while noting reasons for excluding other articles. To validate the accuracy of the reviews, the group further discussed articles where decisions were unclear and retrieving full texts where necessary.

Step 2: Search strategy

We included primary and secondary evidence to understand the topic and methodology better. We designed the search strategy to find all articles about the mental health needs of Pregnant and Parenting adolescents aged 25 years and below. The subject librarian and the review team conducted a search process of studies from the 1st of July 2022 until 28 August 2022. Using the search syntax, studies were obtained from the four databases (MEDLINE, SABINET, EBSCOHOST, Science Direct). We identified relevant studies using keywords such as mental health challenges, adolescents/teenage mothers, adolescents/teenage pregnancy, mental health needs, pregnancy, parenting, and mental health needs. The search keywords were limited to only two disciplines (health and social sciences).

The included articles had to be written in English and published not longer than 20 years ago. We used Google advanced search and configured it to search article titles including a keyword such as mental health in adolescents, with at least one of the words in the article touching on adolescent/teenage pregnancy and adolescent/teenage parenting. We also searched PubMed for articles yet to be indexed for Google Scholar and South African National Electronic Theses and Dissertation Portal for grey literature.

Step 3: Article selection

Screening and selection procedures

The review team tabulated the search results in Microsoft Excel™, removed duplicates, and applied the following inclusion and exclusion criteria:

Inclusion criteria

The review included all studies written and published in English within the past 20 years. Articles with all the keywords or at least one word (mental health, adolescents, pregnant, mother or parenting) in the title were included. All studies focused on mental health illnesses such as depression, stress and anxiety, post-traumatic stress disorders, and suicidal thoughts, their causes, needs, challenges, or interventions amongst pregnant and parenting adolescent girls and young women aged below 10 to 30 years were reviewed.

Exclusion criteria

The following studies were excluded from the review:

- Studies that did not specifically address pregnant and parenting issues of adolescent girls or young women.
- Studies that did not include pregnant and parenting adolescent girls or young women in their population.
- Those that did not contribute information on mental health illness causes, needs, interventions or challenges.
- Studies involving adults were excluded because they cannot be used to discern mental health causes relating to adolescents.
- Articles not available in the English language.
- Full-text articles that could not be retrieved.
- Studies published over 20 years ago.

Step 4: Recording of data

We created a custom Microsoft Excel spreadsheet for data recording of the reviewed articles and checked the data extraction accuracy. The Microsoft Excel spreadsheet included study demographics, methodology, mental health

challenges, needs, interventions, study objectives, and limitations.

Step 5: Collating, summarizing, and reporting results

The review team tabulated critical information from included studies and quantified their characteristics. They then synthesized research findings thematically. By discussing the thematic codes, the reviewers developed a thematic framework, which M.O.M. applied to the remaining articles, and L.M. checked the coding accuracy in all articles. M.O.M. and L.N.M. quantified codes using NVivo word clouds to give a sense of the relative importance attached to the causes of mental health and the needs thereof, as described in the literature. We then developed themes, which were agreed upon by all reviewers.

Step 6: Patient and public involvement

We did not involve patients or families in conducting this review. This part of the review was aimed at mapping out the mental health needs of pregnant and parenting adolescent girls and young women to inform the data collection process for the project.

Results

Table 1 summarises the characteristics of the articles selected for use in this review. The table clarifies the features of the articles in terms of the year of publication, the country of study, methodological details employed in the study, the analysis used, and the part of the article where review information was sourced from. Further, twelve articles (12) were included after two reviewers (L.M and L.N.M) identified more articles through manual hand-searching reference lists.

The data in Table 1 illustrates that most of the articles (n=30.95%) included in the review were from studies published between 2002 and 2013, most of which were conducted in the United States of America (USA). In addition, systematic review articles (33.33%) had the highest frequency compared to other study types. Table 2 shows the list of articles included in the review. The table is arranged

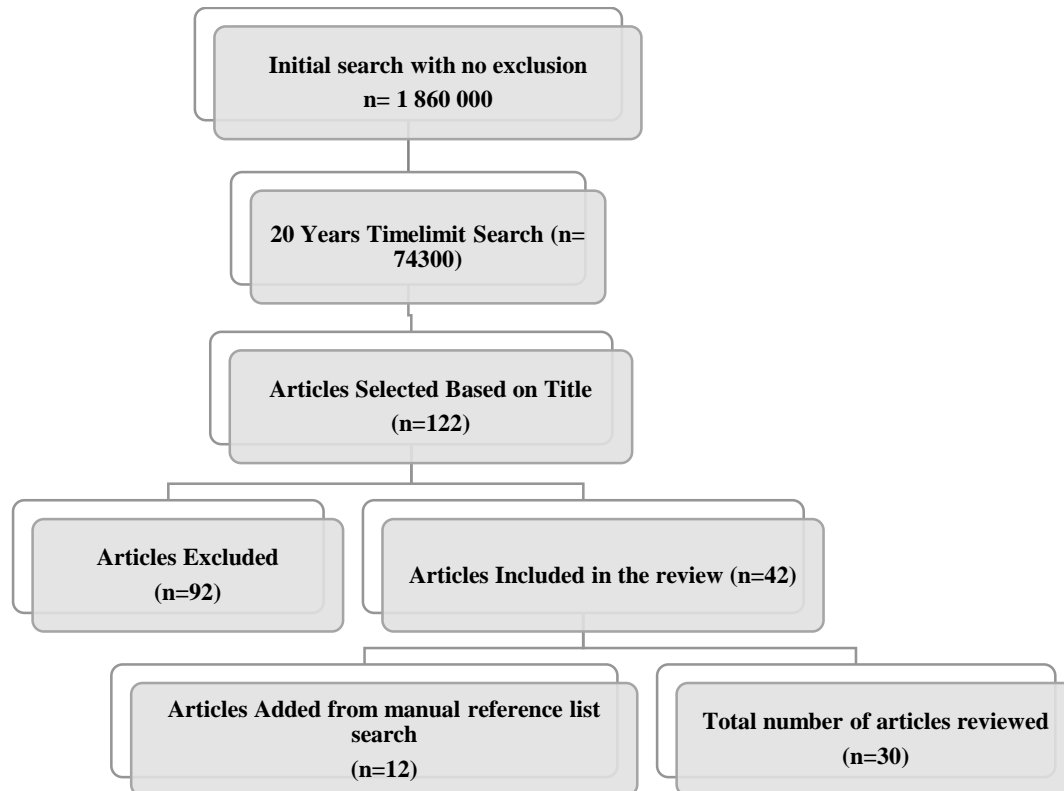


Figure 1: Study selection flow diagram

according to authors, year of publication, country, study design, context data source, age group, needs or challenges and suggested interventions.

Challenges experienced by pregnant and parenting adolescent girls and young women.

In addressing this first theme of challenges experienced by the pregnant and parenting adolescent. The following subthemes emerged from the synthesis; 1.1) Mental health problems experienced by pregnant and parenting adolescent girls and young women; 1.2) health service-related challenges affecting pregnant and parenting adolescent girls and young women; 1.3) parenting effects associated with mental health issues in parenting; 1.4) factors related to mental health in pregnant and parenting adolescent girls and young women.

Mental health problems experienced by pregnant and parenting adolescent girls and young women

The reviewed studies illustrated that pregnant and parenting adolescent girls and young women are vulnerable to mental health problems. Notable is the prevalence of mental health problems among pregnant and parenting adolescent girls and young women^{9,12,16,24,26,37,52} such as depression, stress and anxiety, post-traumatic stress disorders, and suicidal thoughts, were dominant among the reviewed articles. For instance, most studies reported stress and anxiety, post-traumatic stress disorders, and suicidal thoughts that occur during pregnancy and the post-natal period among adolescents^{9,12,16,24,26,37,52} as influenced by various socio-cultural and economic factors. The feeling of depression was associated with denial of pregnancy, lack of parental support or failure to

Table 1: Summary characteristics of included articles

Year of Publication (n=42)	Frequency	Percentage
2002-2013	13	30.95%
2014-2016	11	23.80%
2017-2019	6	14.29%
2020-2022	13	30.95%
Location (n=42)	Frequency	Percentage
Canada	1	2.38%
India	1	2.38%
Kenya	3	4.76%
South Africa	6	14.29%
Sub-Saharan Africa	5	11.90%
Uganda	1	2.38%
United Kingdom	2	4.76%
USA	18	42.86%
Ghana	1	2.38%
Australia	1	2.38%
Germany	1	2.38%
Iran	1	2.38%
Unknown	1	2.38%
Methodological Details of the included studies		
Study type (n=42)	Frequency	Percentage
Systematic review	14	33.33%
Randomised trial	1	2.38%
Quantitative	6	14.29%
Qualitative	9	21.43%
Mixed method	4	9.52%
Intervention Program	1	2.38%
Cross-sectional Data	2	4.76%
Prospective	3	7.14%
Retrospective study	2	4.76%
National comorbidity survey	1	2.38%
The analysis techniques used (n= 30)	Frequency	Percentage
Analytic strategy, cross-lagged path analysis, schematic analysis	1	3.33%
Complete case analysis	1	3.33%
Descriptive analysis	10	33.33%
Meta-analysis models	1	3.33%
Regression analysis	11	36.67%
Report	2	6.67%
Systematic review	2	6.67%
Thematic analysis	2	6.67%
Information Sourced from which part of the article (n= 42)	Frequency	Percentage
Full paper	31	73.81%
Abstract	6	14.29%
Abstract and discussion	5	11.90%

deal with challenges related to pregnant and parenting adolescents⁹.

Health service-related challenges are affecting pregnant and parenting adolescent girls and young women

Another contributing factor observed as a challenge affecting the healthcare needs of pregnant and parenting adolescent girls and young women is the lack of maternal and mental health services tailored to

meet their unique needs, unfriendly adolescent services experienced in public health institutions, lack of confidentiality by healthcare workers and judgemental healthcare workers' attitudes³³.

Legislature-related challenges are affecting pregnant and parenting adolescent girls and young women

South Africa is democratic, with several laws, legislations and constitutions that protect human rights and address mental health problems. For instance, the South African Bill of Rights of 1994 is the cornerstone of democracy. It protects the rights of all people in the country by affirming the democratic values of human dignity, equality, and freedom. The mental healthcare Act 17 of 2002 aims to provide care, treatment and rehabilitation of persons who are mentally ill, and the children's Act 38 of 2005, which aims at giving effect to certain rights of children as contained in the bill of rights. Even though these are in place, the literature reveals that challenges play a role in the mental well-being of pregnant and parenting adolescents, including the lack of legal and cultural protection, the denial of fundamental human rights, and the lack of comprehensive sexuality education²⁹.

Parenting effects associated with mental health issues in adolescents

Low social and economic status is associated with developing mental disorders in children and adolescents in low-and-middle-income countries (LMICs). It has been noted to contribute to poor mental health, harsh parenting, high childbearing regret and parenting stress, and lack of parental counselling and guidance^{25,57}. Additionally, lack of emotional support from family and partners and financial insecurities plays a role¹⁶. Furthermore, pregnant and parenting adolescents often experience the absence of social support, leaving them to feel all alone. These have been witnessed to be prevalent both at home and during antenatal appointments⁴².

Factors associated with mental health in pregnant and parenting adolescent girls and young women

Psychosocial challenges

Psychosocial challenges such as denial of the pregnancy, high childbearing regrets, lack of birth preparedness, unplanned pregnancies, being

Table 2: Summary of Included studies

Study Details First Author	Year	Country	Design Study Design	Context	Data Source	Age Group	Study Outcome(s) Needs/Challenges	Interventions
Bhana et al⁸	2021		Scoping review	Mental health needs	Full paper	10 to 24yrs	Little data addressing mental health treatment in adolescence.	More research is needed to identify evidence-based approaches and corresponding mechanisms for changing sustainable mental health treatment for adolescence
Eboreime et al⁹	2022	Sub-Saharan Africa	Systematic review	Mental health	Abstract and discussion	10 to 19yrs	Teenage pregnancy, complications, sociocultural norms	Ensure pregnant adolescents receive the mental health services and support they need. Prioritizing the mental health and physical health of the girl child
Hodgkinson et al¹²	2014	USA	Qualitative	Mental health needs	Full paper	15 to 19yrs	Prenatal and postpartum depression, risk of substance abuse, chronic and persistent mood symptoms, posttraumatic stress disorder, interpersonal violence disorder	Cognitive or social-emotional resources for the provision of sensitive and responsive parenting.

Laurenzi, et al¹⁴	2020	Sub-Saharan Africa	Systematic review	Interventions targeting mental health in pregnant adolescent	Full paper	n/a	Identifying the role of mental health within these contexts is critical to disentangling the risks that young parents face: poor mental health can complicate an adolescent's ability to be resilient, re-enrol in school, plan future pregnancies, and earn an income.	There is an urgent need to adapt and design new psychosocial interventions that can be pilot-tested and scaled with pregnant adolescents and adolescent parents and their extended networks, particularly in low-income settings
Duby, et al¹⁶	2021	South Africa	Quantitative	Mental, sexual and reproductive health in adolescents	Full paper	15 to 24yrs	Feelings of stress, anxiety and not being able to cope, even to the point of suicide ideation, associated with unexpected discovery of pregnancy, and parenting responsibilities. Violence in relationships, lack of emotional support from family and partners, and financial insecurity interact to exacerbate adolescent girls and young women	Efforts to address early pregnancy and HIV infection amongst adolescent girls and young women incorporate mental health components. Interventions to improve emotional wellbeing and coping mechanisms for adolescent girls and young women are needed. Understanding the context of mental health is crucial in order to design

							vulnerability to poor mental health and sexual and reproductive health outcomes.	and implement effective mental health programming. The provision of appropriate psycho-social support to address sexual and reproductive health challenges.
Mutumba and Harper ¹⁹	2015	USA	Exploration of Bronfenbrenner's Bioecological Systems Theory and the Social Stress Model	Mental health	Full paper	Young key populations (YKP)	Lack of concrete data to inform mental health interventions among adolescents	Strategies to address the mental wellbeing of young adolescents. Integrated interventions for the multiplicity of risk factors such as protection from physical and mental harm and exploitation. The use of evidencebased practices in establishing programmes. The provision of secure conditions that ensures dignity and promote selfreliance and participation in decision-making processes taken in their regard. serve to oppress young adolescent

Osok, et al²⁴	2018	Kenya	Qualitative	Mental Health Needs	Full Paper	15 to 19yrs	Lack of basic needs & provision of care. Restricted educational or likelihood opportunities for personal development post pregnancy	The development of more integrated health services for pregnant adolescents. The development of reproductive education and information dissemination. Strategies to improve community members' knowledge of pregnant adolescents' mental health issues support needed for 1st time mothers in the 1st six months of parenting
East et al²⁵	2012	USA	Quantitative	Mental health challenges & mental health	Full paper	15 to 19yrs	Initial difficulties in parenting, frequent depression symptoms, poor mental health and harsh parenting, high childbearing regret and parenting stress	n/a
Logsdon et al²⁶	2002	USA	Multisite Review	Mental health needs	Full paper	n/a	n/a	Social support to improve pregnancy and parenting outcomes
Berry et al²⁷	2022	South Africa	Quantitative	Mental health challenges	Full paper	12 to 22yrs	High depression risk rate increased substantial, violence victimization,	Recognising the significance of adolescents' relationships and socio-ecological contexts for the wellbeing of both the adolescents and their children

Xavier et al²⁸	2018	USA	Systematic Review	Mental health	Full paper	<20yrs	social factors play an important role in the aetiology of poor mental health beyond the postpartum period among women with a teenage pregnancy	Social factors are important in determining longterm mental health of teenage mothers and should be prioritised in prevention and intervention strategies. Future studies should employ age-period-cohort frameworks to disentangle effects of normative patterns and stress accumulation
Apolot et al²⁹	2010	Uganda	Qualitative	Mental health, health needs and mental health challenges	Abstract and discussion	15 to 18yrs	Maternal health challenges, psychosocial challenges, physical abuse, denial of basic human rights, unfriendly adolescent services, lack of legal and cultural protection, lack of birth preparedness	Strengthening parenting interventions targeting at risk adolescents.

Estrin et al³⁰	2019	United Kingdom	Qualitative	Mental health challenges	Full paper	16 to 24yrs	Anxiety disorders, Homeless or living in emergency accommodation, unemployed or unable to work, unplanned pregnancy, low social support, being a victim of abuse, becoming pregnant	To improve identification and interventions for women experiencing abuse, through training of staff and integrated intervention addressing mental health alongside abuse. Societal and community interventions to address insecure housing, employment and social networks may also reduce the risk of mental health disorders.
Muzik et al³¹	2016	USA	Intervention Program	Mental health services/ intervention	Full paper	15 to 22yrs	Major depression and post-traumatic stress disorder	Development of comprehensive models such as Mom-power program (important to address the mental health needs of young pregnant mothers)
Byford et al³²	2013	United Kingdom	Mixed method	Mental health	Full paper	13-15 and 19-29 yrs.	Predicted coercive parenting behaviours in adulthood.	Provision of intellectually stimulating home environment for the adolescent mothers and teenagers.
Mutahi, et al³³	2022	Sub Saharan	Systematic review	Mental health needs	Full paper	12 to 24yrs	Lack of confidentiality, judgemental health care worker's attitude, lack of services tailored to their unique needs	Lack of services tailored to the

Coyne and D'Onofrio ³⁴	2012	USA	Mixed method	Mental health challenges and mental health	Full paper	n/a	Poor parental monitoring, poverty, physical neglect, parental psychopathology and criminal history, low socioeconomic status maternal illiteracy, and single parenthood are associated with increased teenage motherhood.	A need for social development
DeMarco et al ³⁵	2021	Canada	Systematic review	Mental health challenges	Full paper	≤ 19yrs	Substance abuse, post traumatic disorder	Early and accessible prenatal care in vulnerable adolescents to mitigate the adverse outcomes and maximize the health of young mothers.

Meltzer-Brody et al³⁶	2013	USA	Quantitative	Mental health challenges	Full paper	n/a	Poor social Adjustment and social support, perceived maternal stress and negativity about the pregnancy,	A critical need to screen comprehensively adolescent mothers with depressive symptoms, history of trauma and abuse. The development of differentiated and targeted treatment interventions for adolescents, with attention placed on cultural and ethnic factors
Yakuba and Salisu³⁷	2018	Sub-Saharan Africa	Quantitative	Adolescent pregnancy	Full paper	n/a	Sociocultural, environmental and economic factors e.g., unequal gender relations, poverty, religion, early marriage, lack of parental counselling and guidance, parental neglect, absence of affordable or free education,	Further research is required on the determinants of adolescent pregnancy in the top five subSaharan African countries (i.e., Niger, Mali, Angola, Mozambique, and Guinea). Policymakers and

Roberts ³⁸	2021	Sub-Saharan Africa	Mixed method	Mental Health & Mental health needs	Full paper	10 to 19yrs	<p>lack of comprehensive sexuality education, male's responsibility to buy condoms. Individual factors like the excessive use of alcohol, substance abuse, educational status, low self-esteem, and inability to resist sexual temptation, & curiosity. Health service-related factors e.g., Cost of contraceptives, inadequate and unskilled health workers, long waiting time and lack of privacy at clinics, misconceptions about contraceptives, and non-friendly adolescent reproductive services</p> <p>The absence of research on this topic is a critical evidence gap limiting evidencebased policy and programming responses as well as regional development opportunities.</p>	<p>opinion leaders should focus on community sensitisation, comprehensive sexuality education and ensure girls enrol and stay in schools. Pregnancy rates, peers and significant others should be involved in designing interventional programs for teenage pregnancy prevention. The provision of adolescentfriendly health services at schools and healthcare centres. The initiation of adolescent empowerment programs could have a positive impact on reducing teenage pregnancy.</p> <p>A need for rigorous evidence regarding the mental health of pregnant and parenting adolescents living with HIV.</p>
------------------------------	------	--------------------	--------------	-------------------------------------	------------	-------------	---	---

Barnet et al³⁹	2002	USA	Randomised trial	Adolescent mothers and mental health. Interventions	Full paper	12 to 18yrs	Adolescent mothers experience high rates of depression and their children may suffer because of parental inadequacy.	Professional and paraprofessional home visits to for enhance parenting skills and improve maternal life course. Programmes to identify depressed teens and procedures to engage them in effective treatment.
Shri, et al⁴⁰	2022	India	Quantitative	Adolescent parenting	Full paper	15 to 19yrs	Adverse pregnancy outcomes, and violence contribute to poor pregnancy outcomes in adolescents.	An analysis of adverse pregnancy outcomes amongst to inform public policies & to meet the objectives of the sustainable development goals (SDGs). Improvement of adolescent education on sexual and reproductive rights & access to preferred contraceptive methods. Close monitoring of pregnancy & counselling regarding issues of weight & dietary habits. An understanding of risk factors affecting pregnancy outcomes and maternal death.

LePlatte,et al ⁴¹	2012	USA	Qualitative	Mental health and adolescent parents	Full paper	15 to 21yrs	Seeking mental health services is challenging for parenting teenagers. Few programmes that are embedded into primary care settings, are unable to provide comprehensive and integrated care for the medical, social, and psychiatric needs of teenage mothers and their young children.	Comprehensive care models need to be established to address the many needs that at-risk young mothers and their children face. Mental health needs among adolescents are common, yet commonly unmet, and service delivery complex due to the developmental stage of the target population.
Moltrecht et al ⁴²	2022	UK	Systematic review	Mental health	Abstract	16 to 24yrs	Absence of social support, feeling alone both at home and during antenatal appointments	The importance of supporting both parents during perinatal appointments. Providing parents with mental health support early on. Finding ways to facilitate communication pathways between professionals and parents

Sorsdahl et al⁴³	2021	South Africa	Mixed method	Mental health, Mental health challenges	Abstract and discussion	≤ 25 yrs	Alcohol use, symptoms of depression, self-esteem, social support, family relationship, anxiety, tobacco and other drug abuse, school environment	There is a need to fill an important knowledge gap regarding promising transdiagnostic counselling interventions for at-risk adolescents.
Mchunu et al⁴⁴	2013	South Africa	Cross sectional population-based household survey	Mental health	Full paper	12 to 19yrs	Adolescent pregnancy interferes with young women's educational attainment, resulting in fewer job opportunities for young women,	There is need to concertise adolescents about the prevalence adolescent pregnancy and associated factors in the South African context.
Huang et al⁴⁵	2014	USA	Retrospective study	Mental health issues	Abstract	18yrs	Parenting stress and social support can impact outcomes experienced by adolescent parents and their children.	The importance of examining parenting factors (e.g., parenting stress, social support and maternal depression in adolescent parents
Merikangas, et al⁴⁶	2010	USA	National comorbidity survey	Mental health disorders	Abstract	13 to 18yrs	Common mental disorders in adults first emerge in childhood and adolescence	To transition from common focus on treatment of youth to that of prevention and early intervention

Patchen, et al⁴⁷	2009	USA	Prospective Study	Mental health	Abstract	12 to 18yrs	Depression is identified as a risk for rapid repeat childbearing which is defined as experiencing two pregnancies in less than 24 months	A need for early screening and treatment of depression for young pregnant adolescents.
Pires et al⁴⁸	2014	USA	Cross-sectional	Mental health needs	Full paper	12 to 18yrs	n/a	Improving the quality of irrelations and promoting satisfactory support to prevent and treat depressive symptoms during pregnancy. Identification of adolescents with negative perceptions of the impact of pregnancy to help prevent depression and increase quality of life (QoL).
Zhou, et al⁴⁹	2015	USA	Systematic Review	Mental health risks for adolescent pregnancy and mental health issues that may emerge during	Full paper	07 to 18yrs	psychotherapies are understudied in adolescence	Interpersonal therapy (IPT) and cognitive-behavioural therapy (CBT) should be considered as the best available psychotherapies for depression in

Brown, et al ⁵⁰	2012	USA	Prospective study	pregnancy and parenting for teenage mothers Mental health need and mental challenges	Abstract	<19yrs	Depression among adolescent mothers	children and adolescents. Effective longterm interventions are needed to lessen depression and enhance social support.
Mangeli, et al ⁵¹	2017	Iran	Qualitative	Mental health and mental health challenges	Full paper	19yrs	Adolescent mothers experience many physical, psychological, mental, and social challenges.	Special attention and care support from health care providers. A comprehensive understanding of their challenges. The development of culturally appropriate health promotion guidelines and strategies.
Roberts, et al ⁵²	2022	South Africa	Cross Sectional Data	Risk factors for poor mental health among adolescent mothers	Full paper	<18yrs	Identified risk factors for common mental health disorder among adolescent mothers: history of abuse (physical, sexual or verbal); lack of perceived social support, & exposure to community violence	Rigorous intervention research to determine avenues for the reduction of mental health risk factors, and the promotion of protective factors for the mental health burden among adolescent mothers.

Gbogbo ⁵³	2020	Ghana	Qualitative	Mental health needs and mental health challenges	Full paper	10 to 19yrs	Lack of appropriate interventions strategies like counselling and social support for adolescent mothers	Tailor advice and support to their specific circumstances, e.g., their past experiences, ideas, and expectations regarding the role of motherhood.
Ngum Chi Watts ⁵⁴	2015	Australia	Qualitative	Early motherhood & its challenges	Full paper	17 to 30yrs	Increased responsibilities, social recognition, and a sense of purpose for young mothers. Competing demands of schooling, work and taking care of a baby.	Emerging research to highlight the positive aspects of teen pregnancy and early motherhood. Initiatives and services are required to support young people become parents whilst maintaining broader settlement and life goals.
Kheswa and Pitso; Pitso et al. ^{55,56}	2014	South Africa	Systematic review	Mental health challenges and mental health needs	Full paper	11 to 21yrs	Lack of knowledge and skills during motherhood leading to alcohol use during breastfeeding, a risk for c Fetal Alcohol Syndrome (FAS) development in children. Teenage mothers demotivated and felt embarrassed to seek sexual health care, resulting in	Improving their psychological well-being, sex-education and counselling, should be provided, at home, schools and health centres

Reiss et al ⁵⁷	2019	Germany	Prospective BELLA cohort study	Mental health problems and mental health needs	Full paper	7 to 17yrs	them being exposed to risky sexual behaviours and HIV infections. Children from families with low socioeconomic are at increased risk of suffering from mental health problems	Reduction of socio-economic inequalities and interventions for families with low parental education might help to reduce children's mental health problems.
----------------------------------	------	---------	--------------------------------	--	------------	------------	--	---

pregnant and HIV positive at a young age, and violence were found to contribute to poor mental health and pregnancy outcomes in adolescents^{12,16,24,25,27,29,38,40}. Consequently, these factors have been identified to drive pregnant and parenting adolescent girls and young women towards substance abuse as a coping mechanism, which often leads to poor parenting outcomes.

Sociocultural, environmental, and economic challenges

They are looking at the diversity of the sociocultural, economic and gender inequality experienced in LMICs, including SA^{9,37}. High violence, such as physical abuse, violence in relationships and interpersonal violence disorder, have been observed¹². These are attributed to the poverty status in most of these countries,³⁴ and the cultural concepts of arranged marriages^{9,29}. Wherein teenagers as young as 18 years are expected to marry a man older than them. In other instances, young adolescent girls have sexual relations with older men to make ends meet financially.

The implications of mental health problems among pregnant and parenting adolescent girls and young women

The reviewed articles illustrated diverse implications of mental health problems among pregnant and parenting adolescents^{9,12,16,24,26,37}. The repercussions can be grouped into individual adolescents, adolescent parents, and child-related implications. For instance, some pregnant adolescents were young women vulnerable to poor mental health and sexual and reproductive health outcomes, which restricted them from accessing education or likelihood opportunities for personal development post-pregnancy³⁷.

On the other hand, some studies demonstrated implications related to parenting the child as an adolescent, indicating that children may suffer from parental inadequacy or child neglect

and self-harm in parenting adolescents^{9,12,16,24,26,37}. The review also noted that some pregnant and parenting adolescent girls and young women reported pregnancy and parenting challenges, such as mental health problems and their implications on parenting which overwhelmed them to express the desire for suicidal thoughts.

Recommended interventions/ strategies to address the mental health needs of pregnant and parenting adolescent girls and young women

Within the literature, several studies recommended interventions and strategies that can be adopted to curb the burden of mental health needs and to address the challenges experienced by pregnant and parenting adolescent girls and young women. The recommendations gave this study a view of the possible interventions that can be adopted considering different factors such as social, environmental, educational, and health-related factors.

Strategies for community engagement and dissemination of information

To improve community members' knowledge of pregnant adolescents' mental health issues. Different studies suggested a need to build social awareness among community members regarding their support to improve the psychosocial well-being of adolescents during early motherhood⁵³. Osok *et al.*²⁴ study recommended developing information dissemination strategies to improve community members' knowledge of pregnant adolescents' mental health issues²⁴. A study by Laurenzi *et al.*¹⁴ showed an urgent need to adapt and design new psychosocial interventions that can be pilot-tested and scaled with pregnant and parenting adolescent girls and young women and their extended networks, particularly in LMICs¹⁴. Social support is essential during pregnancy and motherhood because women seek the encouragement of people around them^{14,16,41}.

Development of an educational program to assist in combating mental health challenges amongst pregnant and parenting adolescent girls and young women in schools and communities

The literature revealed that school and higher education institutions based on mental health interventions have long been identified as a gap in the scaling up of mental health interventions for pregnant and parenting adolescent girls and young women^{37,58}. On the other hand, Osok *et al.*²⁴ review study argued that most parental discussions tend to be authoritarian and uni-directional, characterized by vague warnings rather than a direct, open discussion that the adolescents receive and engage in at the school level. Therefore, increasing the engagement of parents and teachers at the school and health facility levels where children are free to communicate and share their ideas or thoughts innocently might help the parents and families to know how to support them, therefore, assisting in curbing the mental health needs of these adolescents²⁴.

Establishment of comprehensive care models to address the mental health needs of pregnant and parenting adolescent girls and young women

A study done in South Africa by Kheswa and Pitso⁵⁵ and Pitso *et al.*⁵⁶ recommended that there is a need for the development of “Young- Mums- to -Be” courses which should be delivered at the local clinics and government hospitals to provide intensive support and counselling around issues such as postnatal depression, low self-esteem, and destructive family relationships. For instance, in 2014, the Department of Health in SA launched and implemented Mom connect App to improve maternal and child health, which has been successfully implemented and recommended^{55,56}.

Development of an integrated programme for improved pregnant and parenting adolescent-friendly mental health services

Several studies have recommended that scaling up holistic mental health services integrated within school, community, and healthcare settings should be further tailored for this group to ensure privacy,

dignity and quality care are offered in a youth-friendly manner.^{24,59} Furthermore, integrating tailored mental health services for pregnant adolescents and young women in sub-Saharan Africa can improve maternal and child health, which is a challenge in SA. Bhana *et al.*⁸ recommended using digital health approaches to integrate mental health treatment into healthcare settings to support more standardized and scalable treatments⁸.

Discussion

This review aimed to identify mental health needs and challenges amongst pregnant and parenting mothers. The review findings indicate mental health problems experienced by pregnant and parenting adolescent girls and young women, which include depression, stress, anxiety, posttraumatic stress disorders and suicidal thoughts^{12,16,24,25,26,27,30,31,43,45,47,50}. Consequently, several studies have revealed that the prevalence of depression amongst adolescent pregnant and parenting mothers may pose several risks for the children. Such risks might impact the developmental stages of their children and the quality of the mother-to-child relationship^{25,34,41,46}. Moreover, a depressed mother might need to be nurtured and cared for, making it difficult to meet her children's emotional and social requirements^{25,34,39,41}. Furthermore, mothers who are depressed may be emotionally unavailable and feel a sense of helplessness amid parenting challenges^{25,51}. The review also identified an association between depressed young mothers and their thinking patterns and behaviours. As a result, they tend to see their children's behaviour negatively and use low rates of reward and high rates of punishment or respond indiscriminately to the child's behaviours^{25,32,39,41,60}.

The review findings also indicated factors associated with mental health in pregnant and parenting adolescent girls and young women, which include sociocultural, environmental, and economic challenges and psychosocial challenges^{9,34,37,57}. It is documented that adolescent parents are mostly found to spend most of their young adult years parenting alone and impoverished^{12,42}. Several studies suggest that many parenting adolescents lack the resources and social support to alleviate stressors^{24,30,36,52}. This

then predisposes them to an increased risk of depression, which can either be self-reported or medically diagnosed^{28,30}. These mental health challenges, if not addressed, have been linked to predicted coercive parenting behaviours in adulthood^{25,41,61}. Therefore, social support is needed to improve pregnancy and parenting outcomes^{25,26}. The review also revealed that most adolescent pregnant and parenting mothers lack basic requirements for the provision of appropriate childcare, resulting in the majority being unemployed and living in poverty-stricken communities^{24,34}.

The review findings also indicated restricted educational or likelihood opportunities for personal development post-pregnancy as some of the contributing factors to mental health problems amongst adolescent pregnancy and parenting mothers^{14,24,34}. Estrin *et al*³⁰ studies recommended developing an integrated health and educational programme to meet their mental health needs³⁰. DUBY *et al*¹⁶; Yakuba and Salisu³⁷ study suggested the provision of adolescent-friendly health services at schools and healthcare centres and the initiation of adolescent empowerment programs could positively impact reducing teenage pregnancy^{16,37}.

In developing countries, early motherhood is a common health issue that requires urgent investigation due to its effects on mothers, children, families, and communities⁵¹. The implications of mental health problems among pregnant and parenting adolescent girls and young women increased vulnerability to mental health, sexual and reproductive health problems⁵². This suggests a need for educational interventions, such as parental coaching, support programs and guidance targeted to pregnant and parenting adolescent girls and young women.

Sustainable Development Goals 3 (SDGs) emphasize ensuring universal access to sexual and reproductive health services, including adolescent-friendly services. Sanders, Divan, Singhal *et al*⁶² noted to need to improve parenting interventions such as young parental programs, combining parenting school and community-based interventions. Lastly, parenting skills should be expanded to attain sustainable development goals⁶². Therefore, it is crucial to inform public policies to meet the objectives of the developmental goals.

Several studies recommended interventions and strategies such as community engagement and the establishment of comprehensive care models and integrated educational programmes that can be adopted to curb the burden of mental health needs and to address the challenges experienced by pregnant and parenting adolescent girls and young women^{31,34,36}. Implementing these interventions and policies can assist in improving the health of pregnant and parenting adolescent girls, young women, and their children. The literature revealed limited research and implementation studies, specifically targeting addressing mental health needs amongst pregnant adolescents and teenage mothers in African regions, including South Africa^{33,37}.

It has also been identified that mental health services currently focus more on adults and do not adequately address the mental health needs and challenges experienced by pregnant and parenting adolescent girls and young women⁶³. According to the SA National mental health policy framework and strategic plan 2013-2020, there is considerable inequity in mental health service provision, especially between the private and the public sectors and urban and rural areas⁶⁴. Furthermore, in SA, there is still a gap in mental health services within community-based mental health services, which are underdeveloped. More importantly, people with mental disorders and disabilities continue to be stigmatized and discriminated against in most aspects of their lives. While mental health services in SA are not fully developed, this indicates the urgent need for the governmental and non-governmental sectors, including the community, to develop and implement mental health services for pregnant and parenting adolescent girls and young women, thereby improving their lives and that of their children. Moreover, Eboime *et al.*⁹ argued that providing sufficient mental, physical, social and policy support to pregnant adolescents is a significant responsibility that should not be considered a choice⁹.

Furthermore, Ngum Chi Watts *et al.*⁵⁴ outline that pregnancy in adolescence and early motherhood is associated with struggle and disappointment. It is therefore important for pregnant and parenting adolescent girls and young women to receive some form of social support from

their families, baby's fathers, friends, and the community. Grandmothers to adolescent mothers and newborns are also known for providing positive reinforcement in the care of children even when they are influenced by popular beliefs⁶⁵. This calls for governmental action and collaborations with other stakeholders such as communities, schools and NGOs to put in educational interventions, such as parental coaching, support programs and guidance targeted to addressing the needs of pregnant and parenting adolescent girls and young women.

Conclusion

The study findings highlight that pregnant and parenting adolescent girls and young women are faced with mental health challenges which include depression, stress and anxiety, post-traumatic stress disorders, suicidal thoughts, denial of pregnancy, high childbearing regrets, lack of birth preparedness, unplanned pregnancies, being pregnant and HIV positive at a young age, and violence as contributory factors of mental health problems for pregnant adolescent and adolescent mothers. According to SDGs goal 3.4. by 2030, all countries are encouraged to have strategies for the promotion of mental health and well-being. However, the study revealed that in SA in SA, there is still a gap in implementing community-based mental health services among adolescent and parenting mothers. Therefore, we recommend that governmental and non-government sectors and policymakers develop and implement community-based mental health services for pregnant and parenting adolescent girls and young women, thereby improving their lives and that of their children. Furthermore, there is also a need for governments, policymakers, and stakeholders to enhance parenting interventions such as young parental programs, combining parenting school and community-based interventions. Limited mental health interventions are provided to the group, including social support, parental coaching and counselling, and guidance that translates to an imbalance between targeted mental health interventions and mental health challenges. We recommend involvement and education of the community on social support, development of digital health programs such as mom connect and integration of mental health services amongst

schools, clinics, and other relevant community development to support pregnant and parenting adolescent girls and young women.

Acknowledgement

The researchers would like to acknowledge Wits Health Consortium for funding the study and DIMAMO PHRC for providing the necessary infrastructure, which is a part of the South African Population Research Infrastructure Network (SAPRIN). This initiative is hosted by the South African Medical Research Council and receives long-term funding from the National Department of Science and Innovation.

References

1. Franjić S. Adolescent pregnancy is a serious social problem. *J Gynecol Res Obstet.* 2018;4(1):006–8.
2. Kumar M, Huang KY, Othieno C, Wamalwa D, Madeghe B, Osok J, Kahonge SN, Nato J and McKay MM. Adolescent pregnancy and challenges in Kenyan context: perspectives from multiple community stakeholders. *Glob Soc Welf.* 2018;5(1):11–27.
3. Cahyaningtyasa DK, Astutib AW and Hanic U. Parents involvement and barriers of programme interventions to reduce adolescent pregnancy. *J Health Technol Assess Midwifery* ISSN. 2020;2620:5653.
4. WHO. Adolescent pregnancy [Internet]. 2022 [cited 2022 Nov 9]. Available from: https://apps.who.int/iris/bitstream/handle/10665/112320/WHO_RHR_14.08_eng.pdf
5. Blum, R.W and Gates, W.H. Blum: Girlhood, not motherhood: preventing adolescent... - Google Scholar [Internet]. 2015 [cited 2022 Nov 9]. Available from: https://scholar.google.com/scholar_lookup?hl=en&publication_year=2015&author=UNFPA&title=Girlhood%2C+not+motherhood%3A+preventing+adolescent+pregnancy
6. Stats SA. Recorded live births [Internet]. 2020 Oct [cited 2022 Aug 26]. Report No.: P0305. Available from: <https://www.statssa.gov.za>
7. Ramulumo MR and Pitsoe VJ. Teenage pregnancy in South African schools: Challenges, trends and policy issues. *Mediterr J Soc Sci.* 2013;4(13):755–755.
8. Bhana A, Kreniske P, Pather A, Abas MA and Mellins CA. Interventions to address the mental health of adolescents and young adults living with or affected by HIV: state of the evidence. *J Int AIDS Soc* [Internet]. 2021 Jun [cited 2022 Nov 9];24(Suppl 2). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8222850/>
9. Eboime E, Ezeokoli A and Adams K and Banke-Thomas A. Prioritizing the mental health needs of pregnant

- adolescents in sub-Saharan Africa. *J Glob Health Neurol Psychiatry*. 2022;
10. Molek K and Bellizzi S. Teenage motherhood in Africa: The epidemic in the COVID -19 pandemic. *Int J Gynecol Obstet*. 2022 Jul;158(1):218–9.
 11. Barron P, Subedar H, Letsoko M, Makua M and Pillay Y. Teenage births and pregnancies in South Africa, 2017–2021—a reflection of a troubled country: Analysis of public sector data. *S Afr Med J*. 2022;112(4):252–8.
 12. Hodgkinson S, Beers L, Southammakosane C and Lewin A. Addressing the Mental Health Needs of Pregnant and Parenting Adolescents. *Paediatrics*. 2014 Jan 1;133(1):114–22.
 13. Nakku JE, Okello ES, Kizza D, Honikman S, Ssebunnya J, Nyanabangi S, Hanlon, S and Kigozi, F. Perinatal mental health care in a rural African district, Uganda: a qualitative study of barriers, facilitators and needs. *BMC Health Serv Res*. 2016;16(1):1–12.
 14. Laurenzi CA, Gordon S, Abrahams N, du Toit S, Bradshaw M, Brand A, Melendez-Torres GJ, Tomlinson M, Ross DA, Servili C, Carvajal-Aguirre L, Lai J, Dua T, Fleischmann A and Skeen S. Psychosocial interventions targeting mental health in pregnant adolescents and adolescent parents: a systematic review. *Reprod Health*. 2020 Dec;17(1):65.
 15. Goossens G, Kadji C and Delvenne V. Teenage pregnancy: a psychopathological risk for mothers and babies? *Psychiatr Danub*. 2015;27(suppl 1):499–503.
 16. Duby Z, McClinton Appollis T, Jonas K, Maruping K, Dietrich J, LoVette A, Kuo C, Vanleeuw L and Mathews C. "As a Young pregnant girl... the challenges you face": exploring the intersection between mental health and sexual and reproductive health amongst adolescent girls and Young women in South Africa. *AIDS Behav*. 2021;25(2):344–53.
 17. Donenberg G, Merrill KG, Atujuna M, Emerson E, Bray B and Bekker LG. Mental health outcomes of a pilot 2-arm randomized controlled trial of an HIV-prevention program for South African adolescent girls and young women and their female caregivers. *BMC Public Health*. 2021 Dec;21(1):2189.
 18. WHO. Improving the health and development of newborns, children and adolescents in the Eastern Mediterranean Region: the regional implementation framework for newborn, child and adolescent health, 2019–2023 [Internet]. Cairo: World Health Organization. Regional Office for the Eastern Mediterranean; 2021 [cited 2022 Nov 9]. Available from: <https://apps.who.int/iris/handle/10665/346301>
 19. Mutumba M and Harper GW. Mental health and support among young key populations: an ecological approach to understanding and intervention. *J Int AIDS Soc*. 2015;18:19429.
 20. Levac D, Colquhoun H and O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci*. 2010;5(1):1–9.
 21. Tricco AC, Lillie E, Zarin W, O'Brien K, Colquhoun H, Kastner M, Levac, D, Carmen Ng, Sharpe, JP, Wilson, K, Kenny, M, Warren, R, Wilson, C, Stelfox, HT and Straus SE. A scoping review on the conduct and reporting of scoping reviews. *BMC Med Res Methodol*. 2016 Dec;16(1):15.
 22. Arksey H and O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol*. 2005 Feb;8(1):19–32.
 23. Pham MT, Rajić A, Greig JD, Sargeant JM, Papadopoulos A and McEwen SA. A scoping review of scoping reviews: advancing the approach and enhancing the consistency. *Res Synth Methods*. 2014;5(4):371–85.
 24. Osok J, Kigamwa P, Stoep AV, Huang KY and Kumar M. Depression and its psychosocial risk factors in pregnant Kenyan adolescents: a cross-sectional study in a community health Centre of Nairobi. *BMC Psychiatry*. 2018 Dec;18(1):136.
 25. East PL, Chien NC and Barber JS. Adolescents' pregnancy intentions, wantedness, and regret: Cross-lagged relations with mental health and harsh parenting. *J Marriage Fam*. 2012;74(1):167–85.
 26. Logsdon MC, Birkimer JC, Ratterman A, Cahill K and Cahill N. Social support in pregnant and parenting adolescents: Research, critique, and recommendations. *J Child Adolesc Psychiatr Nurs*. 2002;15(2):75.
 27. Berry KM, Parker WA, Mchiza ZJ, Sewpaul R, Labadarios D, Rosen S and Stokes A. Quantifying unmet need for hypertension care in South Africa through a care cascade: evidence from the SANHANES, 2011–2012. *BMJ Glob Health*. 2017 Aug;2(3):e000348.
 28. Xavier C and Benoit A, Brown HK. Teenage pregnancy and mental health beyond the postpartum period: a systematic review. *J Epidemiol Community Health*. 2018;72(6):451–7.
 29. Apolot RR, Tetui M, Nyachwo EB, Waldman L, Morgan R, Aanyu C, Al, Mutebi A, Kiwanuka SN and Ekirapa E Maternal health challenges experienced by adolescents; could community score cards address them? A case study of Kibuku District– Uganda. *Int J Equity Health*. 2020 Dec 1;19(1):191.
 30. Estrin GL, Ryan EG, Trevillion K, Demilew J, Bick D, Pickles A and Howard LM. Young pregnant women and risk for mental disorders: findings from an early pregnancy cohort. *BJPsych Open*. 2019;5(2).
 31. Muzik M and Rosenblum K. A Mental Health and Parenting Intervention for Adolescent and Young Adult Mothers and their Infants. *J Depress Anxiety* [Internet]. 2016 [cited 2022 Nov 9];5(3). Available from: <https://www.omicsgroup.org/journals/a-mental-health-and-parenting-intervention-for-adolescent-and-young-adult-mothers-and-their-infants-2167-1044-1000233.php?aid=75434>
 32. Byford M, Abbott RA, Maughan B, Richards M and Kuh D. Adolescent mental health and subsequent parenting: a longitudinal birth cohort study. *J Epidemiol Community Health*. 2014;68(5):396–402.
 33. Mutahi J, Larsen A, Cuijpers P, Peterson SS, Unutzer J, McKay M, John-Stewart G, Jewell T, Kinuthia J, Gohar F, Lai J, Wamalwa D, Gachuno O and Kumar M. Mental health problems and service gaps experienced by pregnant adolescents and young women in Sub-Saharan Africa: A systematic review. *eClinicalMedicine*. 2022 Feb;44:101289.

34. Coyne CA and D'Onofrio BM. Some (but not much) progress toward understanding teenage childbearing: A review of research from the past decade. *Adv Child Dev Behav.* 2012;42:113–52.
35. DeMarco N, Twynstra J, Ospina MB, Darrington M, Whippey C and Seabrook JA. Prevalence of low birth weight, premature birth, and stillbirth among pregnant adolescents in Canada: a systematic review and meta-analysis. *J Pediatr Adolesc Gynecol.* 2021;34(4):530–7.
36. Meltzer-Brody S, Bledsoe-Mansori SE, Johnson N, Killian C, Hamer RM, Jackson C, Wessel J and Thorp JA. Prospective study of perinatal depression and trauma history in pregnant minority adolescents. *Am J Obstet Gynecol.* 2013;208(3):211–e1.
37. Yakubu I and Salisu WJ. Determinants of adolescent pregnancy in sub-Saharan Africa: a systematic review. *Reprod Health.* 2018;15(1):1–11.
38. Roberts KJ, Smith C, Cluver L, Toska E and Sherr L. Understanding mental health in the context of adolescent pregnancy and HIV in sub-Saharan Africa: a systematic review identifying a critical evidence gap. *AIDS Behav.* 2021;25(7):2094–107.
39. Barnett B, Duggan AK, Devoe M and Burrell L. The effect of volunteer home visitation for adolescent mothers on parenting and mental health outcomes: a randomized trial. *Arch Pediatr Adolesc Med.* 2002;156(12):1216–22.
40. Shri N, Singh M, Dhamnetiya D, Bhattacharyya K, Jha RP and Patel P. The Burden of Adolescent Pregnancy, Motherhood and Adverse Pregnancy Outcome in Uttar Pradesh and Bihar [Internet]. In Review; 2022 Apr [cited 2022 Nov 9]. Available from: <https://www.researchsquare.com/article/rs-1454585/v1>
41. LePlatte D, Rosenblum KL, Stanton E, Miller N and Muzik M. Mental health in primary care for adolescent parents. *Ment Health Fam Med.* 2012;9(1):39.
42. Moltrecht B, Dalton LJ, Hanna JR, Law C and Rapa E. Young parents' experiences of pregnancy and parenting during the COVID-19 pandemic: a qualitative study in the United Kingdom. *BMC Public Health.* 2022 Mar 17;22(1):523.
43. Sorsdahl K, Naledi T, Lund C, Levitt NS, Joska JA, Stein DJ and Myers B. Integration of mental health counselling into chronic disease services at the primary health care level: Formative research on dedicated versus designated strategies in the Western Cape, South Africa. *J Health Serv Res Policy.* 2021 Jul;26(3):172–9.
44. Mchunu G, Peltzer K, Tutshana B and Seutlwadi L. Adolescent pregnancy and associated factors in South African youth. *Afr Health Sci.* 2013 Feb 1;12(4):426–34.
45. Huang CY, Costeines J, Kaufman JS and Ayala C. Parenting stress, social support, and depression for ethnic minority adolescent mothers: Impact on child development. *J Child Fam Stud.* 2014;23(2):255–62.
46. Merikangas KR, He JP, Burstein M, Swanson SA, Avenevoli S, Cui L, Benjet C, Georgiades K and Swendsen J. Lifetime prevalence of mental disorders in US adolescents: results from the National Comorbidity Survey Replication—Adolescent Supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry.* 2010;49(10):980–9.
47. Patchen L and Lanzi RG. Maternal Depression and rapid subsequent pregnancy among first-time mothers. *MCN Am J Matern Child Nurs.* 2013;38(4):215.
48. Pires R, Araújo-Pedrosa A and Canavarro MC. Examining the links between perceived impact of pregnancy, depressive symptoms, and quality of life during adolescent pregnancy: The buffering role of social support. *Matern Child Health J.* 2014;18(4):789–800.
49. Zhou Y, Zheng J, Li S, Zhou T, Zhang P and Li HB. Alcoholic Beverage Consumption and Chronic Diseases. *Int J Environ Res Public Health.* 2016 May 24;13(6):522.
50. Brown JD, Harris SK, Woods ER, Buman MPN and Cox JE. Longitudinal Study of Depressive Symptoms and Social Support in Adolescent Mothers. *Matern Child Health J.* 2012 May;16(4):894–901.
51. Mangeli M, Rayyani M, Cheraghi MA and Targari B. Exploring the challenges of adolescent mothers from their life experiences in the transition to motherhood: a qualitative study. *J Fam Reprod Health.* 2017;11(3):165.
52. Steventon Roberts K, Smith C, Toska E, Cluver L, Haag K, Wittesaele C, Langwenya N, Jochim J, Saal W, Shenderovich Y and Sherr L. Risk factors for poor mental health among adolescent mothers in South Africa. *Psychology, health & medicine.* 2022 Dec 15;27(sup1):67–84.
53. Gbogbo S. Early motherhood: voices from female adolescents in the Hohoe Municipality, Ghana—a qualitative study utilizing Schlossberg's Transition Theory. *Int J Qual Stud Health Well-Being.* 2020;15(1):1716620.
54. Ngum Chi Watts MC, Liamputtong P and Memichael C. Early motherhood: a qualitative study exploring the experiences of African Australian teenage mothers in greater Melbourne, Australia. *BMC Public Health.* 2015;15(1):1–11.
55. Kheswa JG and Pitso TJ. Psychological well-being and sexual behaviour of South African teenage mothers: An overview. *Mediterr J Soc Sci.* 2014;5(10):563–563.
56. Pitso T, Kheswa J, Nekhwevha F and Sibanda M. The psycho-social wellbeing of the teenage mothers. *Mediterr J Soc Sci.* 2014;5(10):610–610.
57. Reiss F, Meyrose AK, Otto C, Lampert T and Klasen F, Ravens-Sieberer U. Socioeconomic status, stressful life situations and mental health problems in children and adolescents: Results of the German BELLA cohort-study. *PloS One.* 2019;14(3):e0213700.
58. Kutcher S, Perkins K, Gilberds H, Udedi M, Ubuguyu O, Njau T, Chapota R and Hashish M. Creating evidence-based youth mental health policy in sub-Saharan Africa: A description of the integrated approach to addressing the issue of youth depression in Malawi and Tanzania. *Front Psychiatry.* 2019;10:542.
59. Kumar SR, Davies S, Weitzman M and Sherman S. A review of air quality, biological indicators and health

- effects of second-hand waterpipe smoke exposure. *Tob Control*. 2015 Mar;24(Suppl 1):i54–9.
60. Corcoran J. Teenage pregnancy and mental health. *Societies*. 2016;6(3):21.
61. Huang S, Li J, Shearer GC, Lichtenstein AH, Zheng X, Wu Y, Jin C, Wu S and Gao X. Longitudinal study of alcohol consumption and HDL concentrations: a community-based study. *Am J Clin Nutr*. 2017 Apr;105(4):905–12.
62. Sanders MR, Divan G, Singhal M, Turner KM, Velleman R, Michelson D and Patel V. Scaling up parenting interventions is critical for attaining the Sustainable Development Goals. *Child Psychiatry Hum Dev*. 2022;53(5):941–52.
63. Gelaye B, Rondon MB, Araya R and Williams MA. Epidemiology of maternal depression, risk factors, and child outcomes in low-income and middle-income countries. *Lancet Psychiatry*. 2016 Oct;3(10):973–82.
64. Moodley J. The Significance of Intersectionality in Mental Health-Care Policy in South Africa. In: *The Palgrave handbook of intersectionality in public policy*. Springer; 2019. p. 625–40.
65. Santos AL, Teston EF, Cecílio HP, Serafim D and Marcon SS. Grandmothers' Involvement In The Care Of Children Of Adolescent Mothers. *REME Rev Min Enferm [Internet]*. 2015 [cited 2018 Jan 15]; 19 (1): 55-9.