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Title: An exploration of parents' and guardians' perspectives on facilitators and barriers to menstrual cup usage amongst adolescent girls in De Doorns, Cape Winelands.

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Abstract

Adolescent girls in low-income communities in South Africa often cannot afford to buy disposable sanitary pads. Though menstrual cups are considered relatively cost-effective, uptake in South Africa remains low. This qualitative study investigated parents' and guardians' perspectives on factors that enable or hinder menstrual cup use among adolescent girls. Two focus group discussions and 10 individual interviews were conducted with study participants in De Doorns, a farming community in Cape Winelands. Data were uploaded onto NVivo 14 and analysed thematically. The study findings indicate that parents and guardians viewed menstrual cups as a viable option for upholding adolescent girls' dignity and alleviating the financial burden of purchasing menstrual products. This emerged as a supportive factor for adolescent girls' adoption.

Further, parents and guardians believed that adolescent girls are a diverse group with varying needs, emphasising the importance of promoting their autonomy in choosing menstrual products. However, they encountered various challenges in adapting to menstrual cups, which left them feeling ill-equipped to provide support to their adolescent girls. Concerns related to menstrual cup sizing and fears about potential impacts on virginity were common issues that contributed to their hesitation in endorsing usage among adolescent girls. To facilitate adoption, manufacturers of menstrual cups and community organisations involved in supporting the use of the same should consider parents' and guardians' perspectives, bearing in mind their pivotal roles as caregivers of adolescent girls. Further, there is a need for further knowledge dissemination to increase community buy-in.

Abbreviations

MHM	Menstrual Health Management
MMM	Menstrual Management Materials
AGYW	Adolescent Girls and Young Women
LMICs	Low- and Middle-Income Countries
HICs	High-Income Countries
SSA	Sub-Saharan Africa
FGD	Focus Group Discussion
IDIs	Individual Interviews

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PART A: RESEARCH PROTOCOL

Research Question

What are the facilitators and barriers of menstrual cup use amongst adolescent girls from parents' and guardians' perspectives in De Doorns Cape Winelands?

Purpose of the study

This qualitative study explores parents' and guardians' perspectives on barriers and facilitators of Menstrual Cup (MC) use amongst adolescent girls in De Doorns, Cape Winelands.

Research Objectives

1. To explore parents' and guardians' knowledge, attitudes, and beliefs about menstrual cup usage amongst adolescent girls.
2. To understand parents' and guardians' perspectives on key drivers and influencers of menstrual cup use and menstrual materials used by adolescent girls.

Background/Significance

Menstruation is a natural and essential part of reproductive passage for all women and girls, which requires adequate attention and understanding as it carries stigma and silence. Menstrual health and Menstrual Health Management (MHM) discussions are crucial and, thus, should be prioritised. This is because, as highlighted by the World Health Organization (WHO), menstrual health encompasses a complex interplay of physical, mental, and social well-being, which also impacts the empowerment of individuals (1). This renders menstrual health a critical public health issue, with significant ramifications for girls' and women's well-being at a global level. The achievement of menstrual health relies on proper MHM, defined as access to menstrual health products to absorb or collect blood flow during menstruation, privacy to change materials and facilities to dispose of used menstrual products (2,3). Addressing menstrual health challenges can improve the quality of life for women and girls, as well as promote gender equity and reduce inequalities, contributing to overall

public health and well-being.

There is a global crisis in access to affordable, hygienic menstrual hygiene products. Approximately 10% of girls and women globally experience challenging menstruation cycles due to the inability to access menstrual materials (4). Adolescent girls constitute a vulnerable group which is often affected by the inaccessibility of menstrual materials. This results in adolescent girls and young women (AGYW) using unsafe alternatives such as clothes, rags and newspapers, which is known as period poverty (3). The lack of access to sanitary products is the cause of period poverty, as a result of budget constraints. The occurrence of the phenomenon is more widespread in low-middle-income countries (LMICs) than in high-income countries (HICs) (3).

Period poverty is a challenge for AGYW in resource-limited contexts, including LMICs, where adolescent girls have limited choices for managing menstruation (4,5). Limited access often leads many women to spend long hours with the same sanitary product or resort to available traditional menstrual products, which are often not hygienic, such as cloths and newspapers. Using such products increases the risk of leakage, vaginal infections, and rash (3–5). In LMICs, the challenge is worsened by inadequate facilities for change and disposal of sanitary materials. In addition, there are often challenges to accessing water, which is essential when experiencing menstruation. It is suggested that one in ten girls in Africa misses school when they have their periods (3). This highlights how it is vital to ensure the availability of affordable and hygienic menstrual materials, which are currently lacking in AGYW's lives, which lessens their self-esteem and restricts movement.

In sub-Saharan Africa (SSA), access to affordable and hygienic materials remains challenging. Due to a lack of adequate menstrual products, adolescent girls often experience leakage and foul odour, which results in them being stigmatised, especially by boys, limiting their capacity to concentrate in class and participate in learning activities (6,7). The gap in access to sanitary products is worsened in indigent households where menstrual care ranks as a 'low priority' in the allocation of household resources (6,8). In addition, there is a social stigma attached to menstruation, which makes it difficult for men, who are usually the breadwinners, to prioritise menstrual hygiene in household resource allocation (9). In such instances where limited family resources are diverted to other household needs, some AGYW may be forced to engage in activities such as transactional sex to obtain money to buy sanitary materials, as reported in a study in rural Western Kenya (10). In this study, 10% of participants 15 years and younger admitted to having transactional sex to obtain money to buy pads.

Transactional sex- related unintended consequences may include increased sexually transmitted infections (STIs) and early and unintended pregnancies amongst adolescent girls, which harms their education. Mothers play a critical role in first menarche, sharing advice and guidance on proper MHM and self-care. Understanding parents and guardians offers essential lessons for understanding issues of menstrual material usage amongst adolescent girls. This is so because the concept of 'mother' in understanding menstruation is non-biological but sociocultural (11). In South Africa, at first, menarche mothers play a pivotal role. They can be identified in everyday society as grandmothers, older females in the community, neighbours, aunties, and biological mothers (12). There is a further need for deeper insight into parents' and guardians' perspectives to understand the barriers and motivators of menstrual cup use fully, hence the focus of this study (13). Understanding parents' and guardians' perspectives intends to shed more light on the barriers and facilitators of menstrual cup use amongst adolescent girls as they are vulnerable to period poverty.

Several menstrual hygiene products are available, such as disposable sanitary pads, tampons, and menstrual cups. Menstrual cups are bell-shaped silicone-inserted menstrual hygiene material which collects three times as much fluid as the average tampon (9). This cup is cleaned following the removal of menstrual discharge every 4-12 hours and then reinserted into the vagina, making it appropriate for use in locations with limited access to water (7). The cup can be used for ten years, which provides significant economic savings over the cost of other commercial supplies (9). Menstrual cups are cost-effective, environmentally friendly, and sustainable. Using menstrual cups may be deemed economical in the context of period poverty because they can hold more menstrual blood than sanitary pads and tampons (14–16). The median cost of 145 brands of menstrual cups in 99 countries is US\$23.30, which is cheaper than tampons and sanitary pads (15). Further, menstrual cups are considered more environmentally friendly than other menstrual materials, i.e. Using menstrual cups incurs 5% of the purchase cost and 0.4% plastic waste compared to 12 pads, and 7% of the purchase 6% of plastic waste compared to 12 tampons (15).

In SSA, menstrual cup use so far has been limited, hence the need for research to explore factors that may enable or inhibit the use of menstrual cups in contexts of period poverty, for example, in South Africa, where three and a half million girls experience period poverty due to financial constraints (17). There is evidence of the acceptability of menstrual cups amongst adolescent girls in Kenya, Uganda, and Tanzania (6,7,17). Some of these studies qualitatively explore adolescent girls' perspectives, which is essential to understanding their subjective experiences

interacting with the menstrual cup. Two studies conducted in rural Uganda and rural Kenya, respectively, reported that some mothers influenced their adolescent girls against using menstrual cups due to their subjective reservations about the characteristic features of the cup. However, in both studies, there was no detailed exploration of these parents' views and reservations towards menstrual cups. This study, therefore, aims to provide in-depth information on their perspectives on other facilitators and barriers that strengthen MHM programmes and various levels of intervention in the lives of adolescent girls.

Literature review

Menstrual cups have started to gain popularity as an alternative to the traditional disposable sanitary pads in Sub-Saharan Africa due to the complex interplay of challenges experienced by AGYW. This review delves into the existing literature on menstrual cup usage amongst adolescent girls to understand what has been found in similar contexts where studies asked similar questions found in this study. The review focuses on facilitators of and barriers to menstrual cup usage. The guiding theoretical framework for this study is also presented.

Facilitators of menstrual cup use

Menstrual cups are widely used in HICs where they are deemed cost-effective and sustainable, which makes them a favourable alternative to AGYW in resource-limited contexts. Several studies have explored the comparison between menstrual cups and other usual menstrual products and how that would influence usage. Menstrual cup prices range from US 0.72 to US 46.72. They are reusable for up to ten years, and participants from some of the studies preferred them due to their cost effectiveness in the UK, USA, and Canada (15,18,19). In addition, menstrual cups are regarded as environmentally friendly, a characteristic that most countries embrace as a move towards environmentally conscious practices. Compared to other menstrual hygiene products such as tampons and sanitary pads, menstrual cup reusability over ten years makes them a sustainable and eco-friendly alternative for participants who exhibit eco-friendly values, as reported in a study conducted in the USA (20). While some of these studies have suggested that menstrual cups are environmentally friendly, it is essential to acknowledge that some research indicates the need for more studies demonstrating how they are environmentally friendly (15). Cost-effectiveness and sustainability are suggested in these studies, making menstrual cups a suitable alternative menstrual material in resource-limited contexts.

This renders menstrual cups a feasible option in resource-limited contexts, specifically LMICs, beset with accessibility and limited water supply challenges. Menstrual cups have notable advantages, such as limited leakage and effective control of unpleasant odours, as suggested in studies conducted in Nepal, India, and Iran (21–23). This is because of how they are inserted, and the characteristics of the materials used to make menstrual cups (21,24). Menstrual cups are more effective in collecting menstrual blood than other menstrual products, such as tampons and sanitary pads, as suggested by the systematic review and meta-analysis on leakage, acceptability, safety, and availability (15). One study in rural Nepal suggested a notable reduction in laundry time for users of menstrual cups when compared to other menstrual products (21). While protection from leakage influenced usage, leakage might be experienced in the initial days due to incorrect insertion and removal or haemorrhaging (15).

In SSA, using menstrual cups is deemed economical in the context of period poverty because they can hold more menstrual blood than sanitary pads and tampons. Access to menstrual hygiene products is a necessity not everyone can afford, especially in low-income households (6,9). In addition, as there are often challenges in water supply and facilities for disposal of used menstrual materials, menstrual cups offer a sustainable solution. Menstrual cups do not require frequent changing, making them ideal for areas where access to water is a challenge, as suggested by a study conducted in rural Kenya (6). This makes them a hygienic alternative and environmentally friendly in the context of challenges experienced by menstruating AGYW in SSA. While studies in SSA have suggested menstrual cups to be an adequate alternative for menstruating adolescent girls, usage is influenced by society's acceptance of the menstrual product, as suggested by the literature.

Menstrual cups were met with positive reception by first-time users, like adolescent girls with no experience with tampons. Studies in SSA, such as Kenya and Uganda, have highlighted how adolescent girls embrace menstrual cups in their context (6,7,10). These studies focused on adolescent girls between 12 and 19 years of school-going age. Many parents and guardians of these adolescent girls accepted the use of menstrual cups; however, there were some with reservations as they are insertable. A study on menstrual cups as alternative menstrual management material (MMM) for women and girls in low socio-economic contexts reports on how there are limited studies on adolescent girls' usage. This might be due to cultural barriers that deter such studies from being conducted (9). These studies provide insight into how menstrual cup usage amongst adolescent girls has a positive impact on their well-being in the context of shaming and stigma associated with the lack

of adequate materials to use.

Menstrual cup usage alleviates social stigma significantly amongst AGYW in the context of preventing leakage and foul odour. As AGYW often resort to using ineffective menstrual materials, menstrual cups, as suggested by studies conducted in Uganda and Kenya, menstrual cups effectively absorb and contain menstrual flow, reducing the likelihood of visible stains on clothes (6,10). These studies have expounded on how leakage and bad odour have been the cause of adolescent girls' loss of self-esteem and confidence as they are taunted when they spoil their uniforms in school (6,7,25). Access to reliable and sufficient menstrual products enhances confidence and reduces anxiety about leaks or stains. This positively impacts individual perception, contributing to a positive attitude towards menstruation.

In South Africa, disposable menstrual hygiene products are prohibitively expensive, resulting in women resorting to newspapers, rags, and cloth. The amount spent on menstrual hygiene products for one cycle is between ZAR9 and ZAR200, with an average of ZAR33 (17). Participants in a study conducted in Durban acknowledged how menstrual materials were not affordable. Thus, 91.7% were influenced to use menstrual cups because of their cost-effectiveness (17). As an alternative option, menstrual cups offer solutions that could curb MHM challenges experienced by AGYW regarding access to affordable and environmentally friendly materials.

Additionally, older women in South Africa met menstrual cups with positive reception, which might influence usage amongst adolescent girls. Approximately 3.7 million girls in South Africa lack access to menstrual hygiene products, leading to negative mental and physical health consequences (26). It is suggested that one in seven learners in Gauteng lacked enough products to use during their menstruation (13). The South African context underscores the profound impact of inadequate menstrual materials on adolescent girls. Health risks are magnified using unhygienic materials or improper practices, heightening the susceptibility to infections (27). Furthermore, school absenteeism among adolescent girls often traces back to discomfort, fear of leakage, or insufficient access to menstrual products. Additionally, the scarcity of sanitary materials exacerbates feelings of shame and social isolation, ultimately compromising the mental well-being and productivity of adolescent girls across South Africa. Menstrual cups are a better alternative for adolescent girls in South Africa as they are considered safe and cost-effective, which makes them suitable in low-income households (28). It would be of immense importance in South Africa to gain a better understanding of how menstrual cup adoption amongst adolescent girls would alleviate the challenges associated

with the lack of adequate and sustainable menstrual products. Engaging parents and guardians will provide insights into what would influence their popularity in low-income households.

Furthermore, South Africa has a pool of potential users in low-income settings. A randomised controlled trial and follow-up cohort study were conducted to assess young women's response to the usage of menstrual cups (17,28). These two studies were conducted amongst young women aged between 18-27 years, suggesting that menstrual cups were a preferred alternative even in the population of novice users. These studies ascertained how menstrual cups have been embraced; however, uptake is still low amongst adolescent girls, which can be regarded as a challenge.

Barriers to menstrual cup use

Menstruation is shrouded by cultural stigma, which influences the choice of menstrual hygiene products used by AGYW. Contexts may differ due to diverse geographical locations; however, culture tends to deter menstrual cup use in LMICs (21). Insertable vaginal materials such as menstrual cups tend to be the opposite of cultural acceptability. There is a need to dismantle stigma and norms amongst society at large to fully accept various menstrual products, which would ensure AGYW have informed choices (16). Menstrual products that go against norms tend to take time to become entirely acceptable. In countries like Nepal and India, virginity testing is a cultural theme that literature around menstrual cups has noted, which makes parents and guardians have reservations towards full adoption and use (21). A study focusing on menstrual health management in eight LMICs highlighted the choice of menstrual products to be culturally appropriate to ensure use amongst the menstruating population (29). This cultural stigma creates a gap in knowledge amongst parents and guardians, who are often the custodians of menstrual knowledge.

A barrier to utilising menstrual health products is a lack of information and knowledge. There have been limited studies on visibility in LMICs. Amongst the few studies conducted, it suggested that at first sight, participants were surprised by the size, shape, and texture of the menstrual cup in Nepal and India (21,22). In these studies, findings suggested that participants feared that the menstrual cups would be stuck inside their bodies when inserted (21,22). This reflects how parents and guardians have limited knowledge of menstrual cups, which discourages usage among adolescent girls. This has been witnessed in studies which have been focusing on adolescent girls' usage, which suggested how parents had reservations based on first impressions (24). In LMICs, female parents and guardians are essential actors in influencing menstrual health management. Menstrual cup

literature needs a more in-depth understanding of their role as they have limited information and knowledge of the product.

In SSA, insertable menstrual materials like menstrual cups break the hymen, which is associated with virginity. This affects acceptability as menstruation in countries like Kenya, Tanzania, Uganda, and Zimbabwe have tacit rules, norms, myths, and traditional practices around menstruation, especially when considering inserted menstrual materials (6,9,10,30). This becomes the basis behind parents' and guardians' apprehension towards usage. Two East African studies observed that among some rural girls, menstrual cups were believed to cause infertility and break virginity, which may deter the acceptability of menstrual cup usage in such contexts (6,7). Limited acceptability is evident in reports of limited popularity of menstrual cups in South Africa and Zimbabwe (9,13). To gain a better insight into challenges and barriers, as menstruation has a cultural dimension which needs to be understood from different geographical areas, the perspective of parents and guardians must be explored (12,13).

Parents and guardians lack information and knowledge of menstrual cups to support adolescent girls, making them apprehensive towards usage. In studies conducted in rural Kenya and Uganda, parents and community members discouraged adolescent girls from using menstrual cups for fear of them causing infertility, thus showing signs of a lack of adequate information on the menstrual product (6,7). These information gaps have translated to school policies and government programs that are mostly silent about menstrual cups. Organisations and other interventions have been primarily focusing on traditional menstrual products rather than menstrual cups, which increases their unpopularity as people do not fully accept what they do not know and understand (15). In Western Kenya, in a qualitative study that compared menstrual cups and sanitary pads, some participants did not use the product due to discouragement from parents and guardians (7). The lack of adequate information on menstrual cups makes it challenging for researchers to focus their studies on adolescent girls due to the importance of virginity as a social norm and mothers being the custodians of the tradition (9).

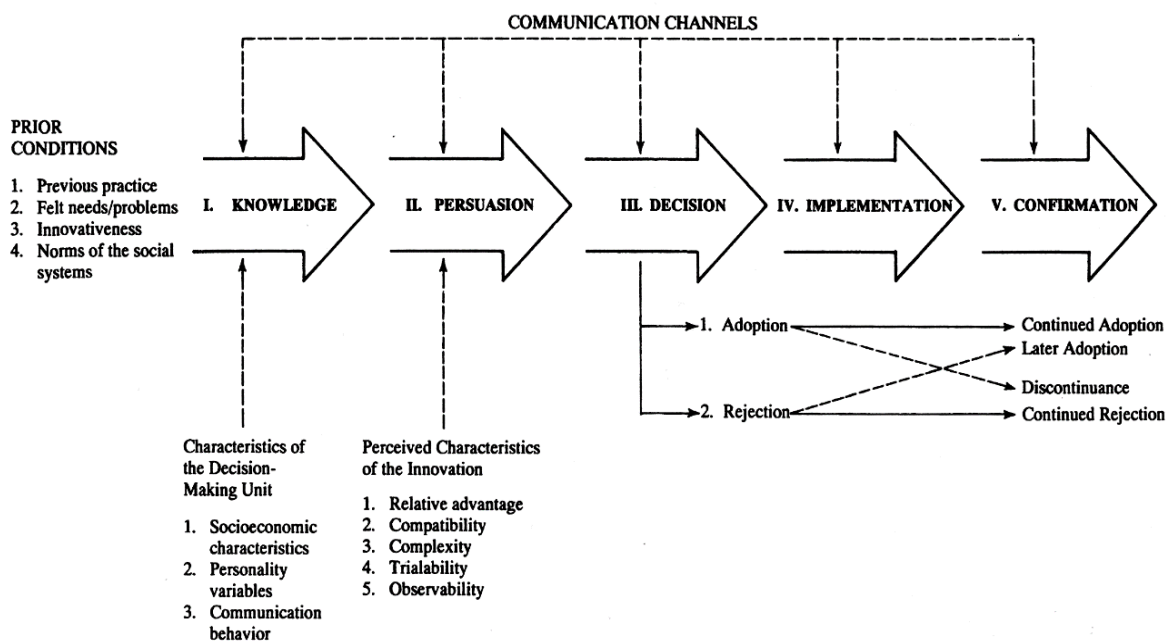
In South Africa, there are limited studies of menstrual cup use amongst adolescent girls. This may be attributed to the same taboos and cultural barriers associated with inserted menstrual management materials in SSA societies (13). Menstrual cup studies suggested that young and older women accepted them; thus, it cannot be generalised to consider adolescent girls as they are considered different based on cultural expectations of being virgins. Menstrual materials adopted and used by

adolescent girls must be supported by skilled female family members and society (12,13,31). South Africa has conducted studies mostly looking at young and older women's perceptions, which needs to provide information on barriers and motivators of the device use amongst adolescent girls. There needs to be more literature on the exploration of parents' and guardians' views of menstrual cup use amongst adolescent girls, as they are critical influencers of menstrual health management. Parents' perspectives provide knowledge that would answer questions that help understand why menstrual cup usage is still not widespread among adolescent girls to inform future interventions in similar contexts across LMICs (30).

Theoretical Framework

This study will apply the Diffusion of Innovation theory as a theoretical lens. The theory, attributed to Everett Rogers, explains how people gradually grasp new ideas or concepts and accept or reject them based on their perceptions (32). Rogers posits that introducing new interventions is surrounded by uncertainties that need to be reduced by information. Although menstrual cups as an innovation have been introduced in LMICs for some time, there has been relatively low uptake among AGYW due to factors such as limited knowledge, as highlighted in the literature (15). In that regard, the innovation-decision process individuals go through is an information-seeking and information-processing stage (32). People, therefore, gain awareness and knowledge by going through the intervention's perceived attributes like relative advantage, trialability, complexity, compatibility, and observability. Due to this, the DOI proposes that the rate of diffusion is influenced by factors such as effective communication, access, availability, and social norms. Subjective evaluations, therefore, take a persuading role as diffusion is a social process that relies on interpersonal communication. Interpersonal communication and sound networks significantly shape individual perceptions and adoption decisions (32). When a new idea is introduced, ensuring that it gets accepted or rejected relies on individuals within the social system perceiving the product as relevant and needed, as highlighted in the study conducted by Oster et al. (33).

Figure 1: Everett Rogers Innovation Decision Process (32)



Diffusion does not simultaneously happen in a society, as demonstrated in LMIC literature showing variations in adoption of menstrual cups where some AGYW were more eager to use menstrual cups than others (6,7,21). Eager users in the cited studies served as peer influencers to drive use amongst other participants. Studies have found that people who adopt an innovation early have distinctive characteristics compared to people who embrace an innovation later. Interpersonal networks ensure that information about the new intervention is exchanged, making diffusion a social process (32). This theory will be utilised as a lens to discuss the study results and, specifically, to identify facilitators and barriers of menstrual cups as perceived by parents and guardians. Considering that parents and guardians play a pivotal role as the gatekeepers of menstrual education, including the selection of menstrual materials, exposing them to the innovation-decision process positions them as influencers in the decision-making process for adolescents regarding their usage (33,34).

Methodology Study Design

The research study will employ a qualitative, exploratory study design. This study design allows the exploration of lived experiences and generates rich, context-specific insights (35). As human experiences are complex and subjective, this study design facilitates a detailed exploration of parents and guardians, providing a nuanced understanding of menstrual cup usage amongst adolescent girls. It is, therefore, essential to understand individual perspectives to be able to gain a better understanding of parents' and guardians' perspectives. Due to its open-ended nature, it allows for the discovery of unexpected insights and patterns, which is essential as in South Africa, qualitative studies focusing on menstrual cup usage amongst adolescent girls are limited (36).

Study Setting

De Doorns, in Cape Winelands, is a viticulture farming community area, which is situated in the Hex River valley, an hour's drive from Cape Town, just N1 and 35 km North of Worcester and 40 km South-west of Touwsrivier (37). The area is in South Africa's table grape industry, the centre of a grape-growing export region surrounded by over 200 table grape farms. In 2011, the population was 11,278, with 12% unemployed and 53% female population (36). The population of De Doorns is made up of Coloured (52 %) and black Africans (39%), who mostly make up the farm workers, and 64% of the people's first language is Afrikaans (37). This study focuses on menstrual cups as a possible menstrual material alternative for vulnerable and low-income families.

The study will involve the New Moon Trust, a community partner in Cape Winelands. New Moon Trust is a South African organisation that manufactures commercial menstrual cups. The organisation has donated 2,830 cups (so far) to vulnerable women and girls in low-income settings (38). Their primary target population are menstruating women and girls, and they believe menstrual cups are an eco-friendly, economical, practical, and empowering menstrual material that can improve menstrual health and management (38). New Moon Trust believes menstrual cups provide an essential sense of dignity. They operate in Western Cape Town and other districts in South Africa.

Population and Recruitment

The research population will comprise parents and guardians of adolescent girls who are beneficiaries of menstrual cups from the New Moon Trust and Mpower organisation in De Doorns in Cape Winelands. The study will, therefore, include female parents and guardians who are above the age of 18 as they will be able to share their insights on either potential intergenerational barriers or facilitators of menstrual cup use amongst adolescent girls. To be eligible for the study, female parents and guardians should have a menstruating adolescent girl in their care. The participants will be selected from low-income settings or poorly resourced communities in De Doorns in Cape Winelands. These participants will be part of the beneficiaries of menstrual cups donated by the New Moon organisation.

Sampling

This study will adopt convenience sampling as participants are recruited from New Moon Trust networks. As this study will be conducted within a limited timeframe, resources, and workforce to conduct the mini dissertation, convenience sampling will allow information collection from easily

accessible participants in De Doorns Cape Winelands (39). This sampling technique aligns with the research study question as, in most contexts' menstrual cups are an innovation in South Africa; participants, therefore, will find it easier to connect and engage from the distribution links. As the convenience population is geographically concentrated, the cost of collecting information becomes lower (40).

Bearing that qualitative and convenience samples are not representative; this study seeks to generate rich descriptive data to increase understanding of menstrual cup use in the De Doorn context. Providing such descriptive detail as possible may enable other researchers to determine the extent to which findings from this study may be transferable to similar contexts (41). However, as this study explores and seeks insight into parents' and guardians' perspectives, the sampling technique provides a platform to access relevant information quickly. The study will include a sample of 20 participants. There will be 2-3 focus group discussions (FGDs), each with 5-6 participants, and 8-10 participants will be selected from the same sample for individual interviews (IDIs).

Data collection approach

The researcher will collect data for this study through FGDs and IDIs. The researcher, NR, is not proficient in Afrikaans. Therefore, a qualified translator will be engaged to facilitate effective communication with participants during data collection to facilitate interactions with participants who prefer to communicate in this language. Additionally, an observer will be present during data collection sessions to assist with notetaking and to provide additional support as needed. Potential participants will be requested to give verbal and written permission to participate in the study (Appendix D and E, pg. 62 &64). Focus group discussions will allow the researcher to use group synergy to gain insight into parents' and guardians' perspectives (42). Such groups are appropriate for this study context as parents and guardians have a forum to share their perspectives on what they think are the key drivers and barriers of menstrual cup usage amongst adolescent girls in a familiar environment and with their peers (35). Focus group discussions allow discussion of shared and variant viewpoints (43).

Eligible 8-10 participants from the total 20 participants, will be invited to engage in IDIs following their participation in the FGDs. This sequential approach aims to delve deeper into their perspectives, experiences, and opinions. By transitioning from FGDs to IDIs, participants are expected to feel more at ease and will be able to express themselves more freely, allowing for a more comprehensive

exploration of the topic. Furthermore, conducting IDIs with the same participants will ensure continuity, facilitating follow-up on issues raised during the FGDs. This approach is also expected to foster a sense of trust and rapport, leading to more candid and honest responses. Participants for individual interviews will be selected based on insights shared, which would require further exploration of their thoughts, feelings, and beliefs about menstrual cup usage amongst adolescent girls (35). Adopting this method ensures triangulation, and the researcher may achieve a more comprehensive understanding of parents' and guardians' perspectives (44).

Before conducting FGDs or IDIs, the study objectives will be explained to the potential participants so they will consent to participate. Informed consent sheets and information sheets will be given to participants for the study. What would be expected of them? After reviewing the consent form and information sheets, participants will be afforded ample time to consider participation. Following this, they will have the opportunity to take the time they need to consider their decision before expressing their willingness to participate. Semi-structured interviews will be conducted where the participants mostly feel safe, for instance, in the comfort of their homes and not in public.

Data Management: Use and protection of research data

This study will generate data in the form of voice recordings for focus group discussions and individual interviews, field notes, which will be written after each visit to the research community, interview transcripts, and electronic reflective journals, which will be uploaded onto a password-protected computer. An independent transcriber will transcribe from Afrikaans to English and anonymise the data before transcribing it into Microsoft Word format for analysis and uploading it to NVivo software on a password-protected computer. All the files will be clearly labelled to make retrieval manageable for the researcher. The signed consent form will be securely kept in a locked cupboard, which can only be accessed by the researcher and two supervisors. Per institutional guidelines, data will be securely stored for five years before disposal.

Data Analysis

This study uses qualitative thematic analysis to gain insight and generate knowledge from parents, guidance experience, and understanding of menstrual cups. Data collected for the study will be translated and transcribed from Afrikaans to English and uploaded onto the NVivo (version 14) qualitative analysis software for easy data management. Audio-recorded FGD and SSI data will be transcribed and translated into English. Braun and Clark's six-step thematic analysis framework (45)

will be employed to analyse data systematically. The researcher will immerse in data to *become familiar* with the depth and breadth of the diverse discussions (45). The researcher will read and re-read transcripts, searching for meaning and patterns before generating initial codes.

The researcher will deductively *generate initial codes* in a meaningful and systematic way and then inductively come up with new codes and iterate on them as we sift through the data. Theoretical thematic analysis will be employed as the study has specific questions which seek to be answered to understand the facilitators and barriers to menstrual cup usage amongst adolescent girls. After generating codes, the researcher will identify patterns in data and *search for themes* to capture and unify the basis of parents' and guardians' perspectives on the barriers and facilitators of menstrual cup usage amongst their adolescent children into a meaningful whole (45). Themes will also be *defined and named* as per Braun and Clark's (45) stages in an organised, coherent, and meaningful way. Thematic analysis will facilitate exploring the subjective experiences and perceptions of menstrual cup usage among study participants. Moreover, similarities and differences across data sets, that is, FGDs and SSIs, will be examined (46). The final stage is to produce a report in the form of a Master of Public Health thesis.

Rigour

Researcher bias and researcher characteristics are essential, as these can influence data analysis. To minimise researcher bias and influence, reflexivity is essential in qualitative research. The student researcher will keep a journal during this study to document the decision process, feelings, and thoughts as a way to minimise researcher bias and misrepresentation that can take place (47,48). An audit trail would be kept throughout the data analysis process of coding and grouping into themes to ensure the rigour and credibility of findings. This will be done and transparent as the researcher will utilise NVivo 14 software, enabling systematic data organisation. Member checking would be done in FGDs and one-on-one interviews as the researcher will repeat what the participants shared to ensure that interpretation aligns with the participant's experiences and perspectives. As data would be collected from FGDs, it would be triangulated with data from one-on-one interviews to corroborate findings and enhance the credibility of the results.

Moreover, peer debriefing would be conducted with the translator and observer in the field during the data collection phases to identify biases and evaluate how we would have collected data and engaged with participants. Supervisors will oversee the entire process since this is a student research project. Established themes and findings would be considered in the context of diffusion of

innovation theory and existing literature.

Ethical considerations

This qualitative research explores and captures parents' and guardians' subjective experiences, meaning, and voices, thus resulting in ethical challenges for participants and the researcher. The researcher will collect data to avoid harm to the participants by applying appropriate ethical principles would preserve the participant's autonomy and dignity as guided by the Helsinki Declaration (49).

Voluntary Participation

Voluntary participation is a principle that is upheld by the researcher when engaging potential participants. To ensure that the researcher will share and explain the study's objectives in the form of informed consent sheets and information sheets and give potential participants ample time to understand what is required of them in the research. This is important as the desire to participate in a research study depends on participants sharing their opinions and experiences (50). The researcher will, therefore, follow up after a day to inquire into questions that need to be answered and clarified before a potential participant decides whether to be involved. This will ensure that potential participants are not pressured to participate in the study as it is voluntary (50). To ensure participants are comfortable, they can terminate the interview at any point should they not want to proceed with the interview.

Reimbursement

No monetary remuneration will be provided for participation in the study. However, New Moon Trust will provide refreshments for all participants.

Informed Consent

Informed consent will be sought both written and verbally. The researcher will share an informed consent sheet with the potential participants, which will provide information on the purpose and duration of the study, the nature of the participation or involvement, and ways to ensure the confidentiality and anonymity of the participants. This is important as participants must be fully aware of what they are getting into to give informed consent before participating (51). The informed consent sheet will be written in plain, simple English for those comfortable with the language and have the option to have another copy translated into Afrikaans, which will reach the level of parents

and guardians in Cape Winelands. Informed consent will allow the researcher to negotiate trust from the participants.

Confidentiality and anonymity

Data will be collected through focus group discussions and one-on-one interviews, so the researcher and supervisors will protect parents and guardians' confidentiality and anonymity. Data collected by the researcher will be treated with confidentiality by separating data from identifiable individuals and storing the codes linking data to individuals securely (52). Due to that, participant's views, perspectives, and experiences will be analysed. The researcher and Supervisors who will have access to the audio recording and transcribed transcript will maintain confidentiality. Parents and guardians will be anonymised by using pseudonyms during the write-up. Regarding FGDs with multiple participants, the researcher will emphasize that complete confidentiality cannot be assured, as participants may share information discussed during the session outside of the research setting. This information will be conveyed to ensure that participants are fully aware and provide their consent voluntarily.

Ethics Approval

The ethics approval will be sought from the University of Cape Town Faculty of Health Science Human Research and Ethics Committee (HREC).

Risks

The study is anticipated to be of minimal risk. Discussing menstrual cup use among adolescent girls to parents and guardians could be uncomfortable to some, as open menstruation discussions are considered taboo in some contexts. To ameliorate this harm, participants can skip any questions that make them uncomfortable and terminate the interview at any given time. If they must speak to experts about their discomfort, a referral will be made to New Moon Trust to assist at the interview site.

Benefits

There is a global crisis of period poverty, with AGYW resorting to the use of unhygienic materials such as rags, newspapers, and foam, which results in leakages, foul odour, and low self-esteem. This study gives insights on information that menstruating women and girls in the proposed research area will know of an alternative material, which literature suggests has limited leakages, no odour, and can be utilised in low-resourced areas where water is a challenge.

The proposed research also answers why menstrual cups are not popular in South Africa, which helps understand the topic from a community-based context and amongst people of low- income status. Parents and guardians will contribute to the generation of knowledge which has the potential to alleviate period poverty in low-income settings. This knowledge can further improve the adoption of menstrual cups, enhancing adolescent girls' menstrual health. De Doorns, as a slum area where water and sanitation are already a challenge for the community, would benefit immensely from the availability of alternative sanitary materials which can be used regardless of their environmental challenges.

Study period and timeframe

Research Activity	Intended Timeline
Protocol submission	End of July
Literature review submission	August
Data Collection	Mid-September-October
Data Analysis	September -November
Draft submission and final write up	September 2023
Submission	January 2024

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PART B: JOURNAL

An exploration of parents' and guardians' perspectives on facilitators and barriers of menstrual cup usage amongst adolescent girls in De Doorns.

Target Journal: Journal of Community Health

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Abstract

Adolescent girls in low-income communities in South Africa often cannot afford to buy disposable sanitary pads. Though menstrual cups are considered relatively cost-effective, uptake in South Africa remains low. This qualitative study investigated parents' and guardians' perspectives on factors that enable or hinder menstrual cup use among adolescent girls. Two focus group discussions and 10 individual interviews were conducted with study participants in De Doorns, a farming community in Cape Winelands. Data were uploaded onto NVivo 14 and analysed thematically. The study findings indicate that parents and guardians viewed menstrual cups as a viable option for upholding adolescent girls' dignity and alleviating the financial burden of purchasing menstrual products. This emerged as a supportive factor for adolescent girls' adoption.

Further, parents and guardians believed that adolescent girls are a diverse group with varying needs, emphasising the importance of promoting their autonomy in choosing menstrual products. However, they encountered various challenges in adapting to menstrual cups, which left them feeling ill-equipped to provide support to their adolescent girls. Concerns related to menstrual cup sizing and fears about potential impacts on virginity were common issues that contributed to their hesitation in endorsing usage among adolescent girls. To facilitate adoption, manufacturers of menstrual cups and community organisations involved in supporting the use of the same should consider parents' and guardians' perspectives, bearing in mind their pivotal roles as caregivers of adolescent girls. Further, there is a need for further knowledge dissemination to increase community buy-in.

Keywords: Menstrual cups, facilitators, barriers, parents and guardians, menstrual health, and management

Introduction

Menstrual hygiene management (MHM) is critical for adolescent girls' well-being and is pivotal in improving their quality of life; hence, it is a significant public health concern. In South Africa, 3.7 million girls lack access to menstrual hygiene products, leading to negative mental and physical health consequences (1). This lack of access to sanitary products due to financial constraints, often referred to as period poverty, is highly prevalent among adolescent girls and women in low-income settings. There are various menstrual hygiene materials currently available in the market. These include menstrual cups, which have gained popularity amongst young and older women as a sustainable alternative. Menstrual cups are reusable materials that can potentially improve women's and girls' menstrual experiences, preserving their dignity (2,3). Understanding factors that would influence usage amongst adolescent girls is essential to ensure a holistic approach to menstrual health management. It is, therefore, crucial to understand the facilitators and barriers of usage amongst adolescent girls from female parents' and guardians' lenses, as they play an essential role in shaping their perspectives on choices of menstrual materials as menstruation has a cultural dimension.

There is limited information on the usage of menstrual cups amongst adolescent girls and young women (AGYW) in South Africa. However, studies conducted on young women and older women suggest that period poverty may drive menstrual cup usage in South Africa (4,5). Disposable menstrual hygiene materials in South Africa are prohibitively expensive, which results in women using unsafe alternatives, increasing the risk of leakage, and diminishing their dignity (2,4,6). Studies from neighbouring countries, such as Kenya, Uganda, and Tanzania, found that menstrual cups are an acceptable and sustainable alternative for adolescent girls (7,8). In South Africa, menstrual cups are thus considered a feasible option, including for first-time users like adolescent girls with no experience with tampons (2).

Despite the advantages of menstrual cups, some adolescent girls and parents have expressed reservations about using menstrual cups. These reservations were based on the characteristics and nature of insertable menstrual materials that affect the hymen. Insertable vaginal materials such as menstrual cups tend to be counter-cultural in countries such as South Africa, Kenya, Tanzania, Uganda, and Zimbabwe, where prevailing beliefs discourage the use of insertable menstrual materials for fear of potentially breaking girls' hymen (associated with loss of virginity) and causing infertility (3,7). Skilled female family members and society must support menstrual materials adopted and used by adolescent girls (6,9,10). Female parents and guardians are often the custodians

of menstrual information yet have limited knowledge of menstrual cups, which makes them discourage usage. There is a need to dismantle stigma and norms amongst society at large to fully accept various menstrual materials, which would ensure adolescent girls and young women (AGYW) have informed choices (11,12).

Given the limitations of prior studies, mothers and female guardians of adolescent girls offer important lessons for understanding issues of menstrual materials usage amongst adolescent girls. This is because the concept of "mother" in understanding menstruation is non-biological but socio-cultural (13). In South Africa, mothers can be identified in everyday society as grandmothers, older females in the community, neighbours, aunts, and biological mothers (9). However, despite understanding the critical role they play, there still needs to be more comprehensive research on mothers' and female guardians' perspectives on menstrual cup usage amongst adolescent girls. Previous empirical studies have demonstrated that mothers and female elders are the gatekeepers and custodians of information, advice, and guidance on proper menstrual health management and self-care (14).

This study, therefore, sought to bridge this knowledge gap by exploring parents' and guardians' perspectives on facilitators and barriers to menstrual cup usage amongst adolescent girls. Menstruation in African society is not one-dimensional; hence, understanding parents' and guardians' perspectives ensures menstrual health management is approached holistically considering the cultural and social dimensions of menstrual management.

The objectives of this study were:

1. To explore parents' and guardians' knowledge, attitudes, and beliefs about menstrual cup usage amongst adolescent girls.
2. To understand parents' and guardians' perspectives on key drivers and influencers of menstrual cup use and menstrual materials used by adolescent girls.

Theoretical framework

This study utilised the Diffusion of Innovation theory as a theoretical lens. The theory, attributed to Everett Rogers, explains how people gradually grasp new ideas or concepts and accept or reject them based on their perceptions (15). Rogers posits that introducing new interventions is surrounded by uncertainties that need to be reduced by information. Although menstrual cups as an innovation have been introduced in LMICs for some time, there has been a relatively low uptake among AGYW due to factors such as limited knowledge, as highlighted in the literature (16). In that regard, the innovation-decision process individuals go through is an information-seeking and information-processing stage (15). Individuals gain awareness and knowledge by going through the intervention's perceived attributes like relative advantage, trialability, complexity, compatibility, and observability. Due to this, the DOI proposes that the rate of diffusion is influenced by factors such as effective communication, access, availability, and social norms. Subjective evaluations, therefore, take a persuading role as diffusion is a social process that relies on interpersonal communication. Interpersonal communication and sound networks significantly shape individual perceptions and adoption decisions (15). When a new idea is introduced, ensuring that it gets accepted or rejected relies on individuals within the social system perceiving the product as relevant and needed, as highlighted in the study conducted by Oster et al. (17).

Diffusion does not simultaneously happen in a society, as demonstrated in LMIC literature showing variations in adoption of menstrual cups where some AGYW were more eager to use menstrual cups than others (7,18,19). Eager users in the cited studies served as peer influencers to drive use amongst other participants. Studies have found that people who adopt an innovation early have distinctive characteristics compared to people who embrace an innovation later. Interpersonal networks ensure that information about the new intervention is exchanged amongst people, which makes diffusion a social process (15). This theory will be utilised as a lens to discuss the study results and, specifically, to identify facilitators and barriers of menstrual cups as perceived by parents and guardians. Considering that parents and guardians play a pivotal role as the gatekeepers of menstrual education, including the selection of menstrual materials, exposing them to the innovation-decision process positions them as influencers in the decision-making process for adolescents regarding their usage. (17,20).

Methodology

Study Design and Setting

There is limited research available on menstrual cup usage among AGYW. Thus, an exploratory qualitative study design proved helpful in understanding the nuances of menstrual cup usage from the stance of parents and guardians, which is also an issue that has been modestly studied (22). Der Doorns is a predominantly Afrikaans-speaking viticulture farming community in the Hex River valley and half an hour's drive from Cape Town (21). The area provides South Africa's rural areas and small-town sub-region. In 2011, it had a population of 11278, with Coloureds (52%) and black Africans (39%) making up the population, with 12% unemployed and 53 % female (21,22).

Population, Recruitment, and sampling

The study participants comprised female parents and guardians of adolescent girls. All participants were adults aged 18 years and above from poorly resourced communities in Der Doorns, and each had at least one menstruating adolescent girl in their care. Participants were recruited through New Moon Trust, a community-based organisation based in the area. New Moon Trust acted as the gatekeeper therefore introducing the student researcher in the community. The student researcher was therefore responsible for the active recruitment of participants. Convenience sampling was adopted due to limited timeframe and resources (23). New Moon Trust is a South African organisation operating in Western Cape Town and other districts in South Africa. The organisation manufactures menstrual cups for commercial purposes, and as a way of giving back to the community, they have donated 2,830 to vulnerable women and girls in low-income settings (24). A total of 10 parents and guardians participated in individual interviews (IDIs), while two FGDs were conducted with 9 and eleven participants, respectively.

Data collection

Data was collected from October to November 2023 by a team comprising a researcher, a translator, and an observer. De Doorns is predominantly Afrikaans, so the translator's role was to facilitate effective communication while ensuring accuracy and cultural sensitivity throughout data collection. The observer noted nonverbal nuances during the FGDs, which were conducted in a mix of English and Afrikaans. IsiXhosa language speakers in the group were fluent in Afrikaans. Informed consent

was sought from the participants with both the translator and observer present during FGDs. Participants were afforded ample time to review the consent form carefully at their own pace. All participants provided written consent prior to participating in the study.

Additional data was collected through field notes, pre-data collection, and post-FGDs based on a mapping exercise and individual interviews for a selected few from the FGDs. Pre-data collection visits to the research site was conducted as a way of being introduced to the community and potential participants. An invitation of a women's day celebration was extended which allowed better interaction and establishing rapport with potential participants. During the FGDs, participants were introduced to a mapping process. In this approach, participants used visual representations (drawings of their bodies) to communicate their experiences, thoughts, and emotions. The FGD-based mapping exercise examined parents' and guardians' knowledge and gained access to their perceptions of menstrual cup usage amongst adolescent girls (25). Analysis was therefore conducted with participants' verbal reflections to gain insights into their experiences with menstrual cups. Participants' experiences with menstrual cups were inferred to adolescent usage. Similarities or differences in experiences were identified between adult participants and potential adolescent users, considering factors such as comfort, ease of use, and emotional responses. After the session, the research, translator, and observer had a debriefing session reflecting on the session and identifying possible participants as follow up for the IDIs. Ten individual interviews were conducted with a selected few from the FGDs. Audio recordings were stored in OneDrive, accessible only to supervisors as this is a student thesis.

The student researcher employed FGDs followed by IDIs to delve deeper into participants' perspectives. Building on the rapport established in FGDs, IDIs facilitated candid exploration of experiences and opinions, ensuring comprehensive data collection and continuity in addressing research themes. Two focus group discussions were conducted, engaging a total of 20 participants, with subsequent IDIs conducted for 10 participants. The FGDs took place in a local creche near participants' residences and in a church following a church session. Following each FGD, IDIs were conducted either on the same day, at participants' homes for immediate follow-up, or the following week for those unable to meet immediately, ensuring comprehensive data collection.

Data Analysis

Data was translated, transcribed verbatim, and uploaded to NVivo 14 software for easy data management. Braun and Clark's six-step framework for thematic analysis (26,27) was utilised to analyse data. Codes were developed inductively through an iterative process of reading transcripts multiple times, grouping them based on themes, and revising them by both supervisors. Data analysis initially followed a deductive approach using a conceptual framework. However, as novel insights began to emerge, we employed a more inductive approach, incorporating Thematic analysis. This allowed for a more nuanced exploration of emerging themes and enriched the depth of our findings. An audit trail was kept throughout the data analysis process of coding and grouping into themes to ensure rigour. Member checking was done in FGDs and IDIs to facilitate an accurate representation of participants' experiences and perspectives. Data collected from FGDs was triangulated with data from one-on-one interviews to facilitate understanding of nuances of kin menstrual cup usage from individual and co-constructed group perspectives and enhance the credibility of the results.

Moreover, peer debriefing was conducted with the translator and observer in the field during the data collection phases to identify biases and evaluate the data collection process and participant engagement. Supervisors oversaw the entire process because this is a student research project. Established themes and findings were considered in the context of diffusion of innovation theory and existing literature. Ethical approval for the study was obtained from the University of Cape Town's Faculty of Health Science Human Research Ethics Council (HREC Ref: 474/2022) (See Appendix G pg. 67)

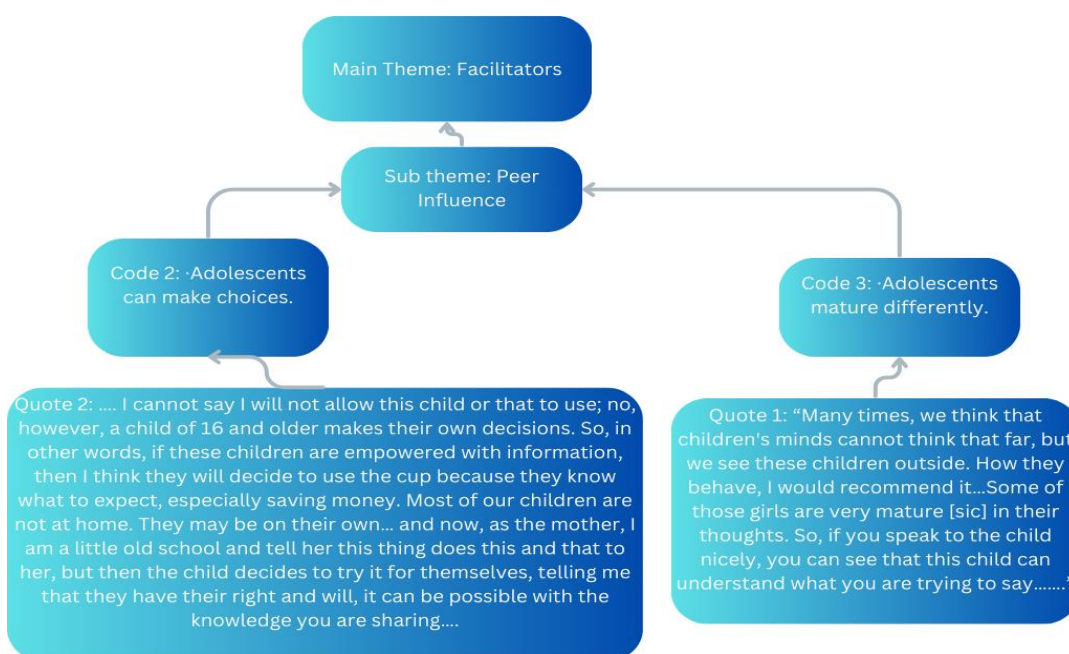
Study Sample

The study sample consisted of 20 female participants with ages ranging from 23 to 65 years. Among the participants, some reported caring for between 1 to 3 adolescents in their care. Participants were recruited from diverse occupational backgrounds, including roles in private households, vineyards, creches, and as assistants. Educational backgrounds varied, with participants having completed standard 8, matriculation, or attained diplomas. This diversity in occupational roles and educational levels reflected the varied socioeconomic status of the participants. The comprehensive description of the study sample provides essential context for understanding the subsequent analysis of themes and findings.

Research Findings

This section presents findings on parents' and guardians' perspectives on facilitators and barriers to menstrual cup usage amongst adolescent girls. Focused group discussions and Individual Interviews were conducted amongst female parents and guardians aged 25 to 59. Findings revealed 5 facilitators, namely relative cost advantage, preserving dignity supersedes cost, free menstrual cups as trade-offs, peer influence and choice and autonomy and 4 barriers, namely cost of menstrual cups, limited menstrual cup knowledge and apprehension towards novelty, pragmatic concerns about menstrual cup use and cultural stigma and concerns about menstrual cups breaking hymen. These facilitators and barriers are detailed in subsequent paragraphs, drawing from FGD and IDI data.

Figure 2: Coding tree



Facilitators of Menstrual cup usage

Relative cost advantage

Several participants identified disposable sanitary pads as their menstrual products before the discussion. Even so, there appeared to be consensus that sanitary pads were expensive, adding to their financial burdens. Challenges in accessing proper menstrual hygiene products forced women to resort to using improvised materials such as low-quality sanitary pads, as illustrated in the following excerpt:

Tamani (FGD 1): They cost much money, so maybe R60 for a month.

Kimberly (FGD 1): Some pads are Fake; they have these Japanese things R18. So that is a waste of time because it only lasts for a while. It moves around, which leads to a mess [**all participants nod in agreement**].

The excerpt reflects how participants were forced to use inadequate sanitary pads due to their circumstances, increasing the possibility of experiencing leakage. This could lead to discomfort, embarrassment, and a sense of shame. The use of less effective sanitary pads has a negative impact on AGYW's dignity, that is when affordable and accessible menstrual products are not readily available.

Preserving dignity supersedes cost

In the context of period poverty, women were forced to choose between preserving finances and preserving their dignity. Menstrual leakage often results in embarrassing situations for women and girls due to menstrual bloodstains on clothes. Women working on farms experienced discomfort and distress, as illustrated by participants from FGD 2.

Raina...you are away from home the whole day.... You are rash-ed [sic], wet and stink. You feel dirty. You do not want to be close to men because, if you open your legs, especially when you get onto the truck, you can smell yourself when you lift your legs. You feel uncomfortable. You feel less of a person because you know something is wrong, and people can smell it, too. They also gossip amongst themselves that so and so does not smell nice...

Miriam: the wetness is not pleasant. Furthermore, as I had mentioned to another participant earlier, like for them in the vineyard, it is difficult when you are standing there and the manager or owner is there; if you feel like "I am wet", then you cannot just walk and go to the bathroom quickly. It is not possible because there are no toilets in the vineyard. So now, when you wear a pad, it smells because sometimes you must pee in the vineyard. It isn't easy.... I also mentioned to her that it would probably be easier if you have that cup, then, you will not be as wet the whole time. I cannot deal with the wetness, but I am not in the position to do anything in the vineyard, so we place used pads in the bag [Raina, Lilian, and Pricilla agreed and mentioned that they keep used sanitary pads in their]

Participants reported feelings of shame, embarrassment, and a diminished sense of self-worth associated with using cheap materials and increased leakage. Period poverty, as described by parents and guardians, is shrouded in stigma, which may have adverse effects on adolescent girls' self-esteem. Through the stories and experiences shared, it is evident that low-quality sanitary materials negatively impact their everyday lives. This reflects on the adolescent girls in their care, suggesting that they might face similar challenges. Consequently, the parents and guardians expressed openness to utilizing free menstrual cups, recognizing the potential benefits in alleviating the stigma and providing a more reliable menstrual health solution for the girls.

Encouraged adoption through free distribution

Parents and guardians were recipients of donated menstrual cups from a local NGO. These donated menstrual cups were introduced to mitigate challenges to menstrual health experienced by AGYW in De Doorns. In this context, Kelly shared how challenging accessing affordable menstrual materials was for them; hence, access to free menstrual cups would be a welcomed gesture in low-income settings.

Kelly (IDIs): So, doing pads shopping is like shopping for food now.

Free menstrual cups were deemed more cost-effective than cheap, low-quality sanitary materials. This resulted in some parents being willing to try using them as they often struggled with sanitary pads costs, as expressed in the excerpts.

Katie (FGD 2): I would also say that I will go for it because, like I said earlier, it makes me feel comfortable, and it does not soil my clothes, and it saves, like I said earlier, it saves us money to have to buy pads.

Priscilla (FGD 2): I am also scared, but I will try to use it because I do not always have money for pads and so forth.

Free menstrual cups gained societal approval as women were receiving menstrual materials without having to spend money on them. This structure improved accessibility for women facing challenges affording menstrual materials. Therefore, positive dissemination and interaction were experienced regarding how these free menstrual cups were a favourable alternative.

Peer Influence

The excerpts below demonstrate that FGDs were peer interaction, learning, and group meaning-making forums. The importance of open discussions among parents and guardians came through in these discussion sessions. As participants had access to menstrual cups, they were a blend of individuals possessing knowledge of MCs while others lacked it. Several participants expressed general apprehension towards usage, which resulted in some participants sharing their knowledge and expertise.

Susan (FGD 2): They say you must fold it, and then you push it in. No, for me, it looks very sore. I am very afraid of this thing. I am scared that it would go inside and be stuck. If I push it in too deep, how will I get it out? That is why I have not used mine yet. I am rather still using pads.

Lilian (FGD 2): There is a certain level where it stops, so it will not go here on top.

Portia (FGD 2): if you have folded it, it is not possible. See, as a woman on the inside, if you have felt yourself, you might notice that you feel round inside your vagina. So, when the cup opens inside you, it will stay right there, just as round.

Peer interaction gave more insight and assurance to participants with limited awareness and understanding of the menstrual cup. This, therefore, influenced usage by other people, as highlighted by Susan, who was now a menstrual cup user after being introduced by a peer.

Susan (IDIs): ... I heard about it when Tammy came here, and I am glad Regina came because women are now using it. The other day, I saw a young girl, and she came up to me as she had gotten the cup from the church that day. She called me Dune [Nickname], your thing is working. I am telling you she was wearing white pants. I asked her why she wore white on her period, and she said the cup worked. I asked her again to be certain, and she told me she liked it and would use it again. She said she would tell her friends....

As highlighted in the above quote, interpersonal communication influences usage amongst other people. Hence, during focus group discussions, some participants enhanced their self- understanding and arrived at the conclusive realisation that menstrual cups were unsuitable for them, as illustrated by an excerpt from FGD one.

Tanya (FGD 1): for me, it was a very good session. The cup story is very good because many people cannot afford pads, but I don't think it is for me. But it is something good.

Jane (FGD 1): It was a good session. I think going forward, this looks like something for the future; I mean, it would be, how do I say, would be more normal.

Peer interaction influenced usage amongst other parents and guardians as their knowledge gaps were filled by participants who had experience. Therefore, participants with limited experience and exposure to MCs were reassured by other participants' experiences and testimonies, which gave them a better understanding of menstrual cups, which could benefit adolescent usage. Such interactions may positively influence the uptake of menstrual cups in due course, as some parents and guardians were open about adolescent girls making the choice.

Primrose (FGD 2): Today's session helped a lot. I learned more, the fear will likely disappear from me, and I would recommend my child to use the cup and I will explain it to her, what I learned here today and maybe in the future, she can tell her friends, if she went to school on Monday, tomorrow, then she will say, "My mommy went to a session today about a cup that we as young people can use" Then maybe that girl will tell her, I'm going to go home with you, so your mom can just show me what the cup looks like, then your mom can give it and I can take it home" and that's how the cup will travel

Peer influence is critical in promoting new practices. For example, a parent who learns about menstrual cups and recommends them to her daughter, who then shares this information with her friends, highlights how peer networks can facilitate the spread of innovative solutions. This underscores the role of community and peer influence in driving the acceptance and adoption of health practices.

Choice and autonomy: "But it also depends on her..."

Parents and guardians discussed the concept of choice and autonomy in menstrual material selection, emphasising maturity as a determining factor. They reflected on how adolescent girls mature differently; hence, some may be able to understand the complexities surrounding MCs. As perceived by parents and guardians, usage was not a one-size-fits-all fit; hence, they had the responsibility to assess their daughter's maturity.

Lynett (FGD 2): "Many times, we think that children's minds cannot think that far, but we see these children outside. How they behave, I would recommend it...Some of those girls are very mature [sic] in their thoughts. So, if you speak to the child nicely, you can see that this child can understand what you are trying to say....."

Parents and guardians acknowledged their generational differences, impacting their adolescent usage perspectives. Despite parents and guardians acknowledging limited menstrual cup knowledge, they were willing to make concessions so as not to deny adolescent girls the opportunity to try something new. Adolescent girls ought to take control of their bodies at some point and make choices as they are still struggling to understand the new menstrual product, as highlighted by Tammy, a focus group participant:

Tammy (FGD 2): I cannot say I will not allow this child or that to use; no, however, a child of 16 and older makes their own decisions. So, in other words, if these children are empowered with information, then I think they will decide to use the cup because they know what to expect, especially saving money. Most of our children are not at home. They may be on their own... and now, as the mother, I am a little old school and tell her this thing does this and that to her, but then the child decides to try it for themselves, telling me that they have their right and will, it can be possible with the knowledge you are sharing....

Parents and guardians perceived mid and late-adolescent girls to be capable of making menstrual cup usage-related choices. This was based on their reflection on usage; hence, they were willing to allow them to choose. Their only concern was the need for information and knowledge to be shared with adolescent girls, even in clinics, for the choice to be informed, as suggested by Tanya during one-on-one interviews.

Tanya (IDIs): I think that is the primary reason because of the privacy. She must be introduced first to the cup. Maybe if it can be done clinically... Like if there can be a route or path where someone can clinically show her how to use it, but I am not comfortable; however, it also depends on her... I am also a parent who says she needs to like the thing. She is free to choose.

While some participants conveyed their discomfort in encouraging adolescent girls' usage of MCs, the overall view shared by a significant number of participants was encouraging choice and autonomy even if MCs were not for them. This, to a certain level, signifies partial support based on their lack of adequate knowledge, which they would require to offer support. Parents and guardians require more information and awareness so that they may actively support adolescent girls with valuable advice to make informed choices.

Barriers to Menstrual Cup Usage

Cost of menstrual cups

As noted in the previous section, menstrual cup use among AGYW in De Doorns was made possible by free donations, without which they could only afford cheap sanitary materials. In this regard, purchasing menstrual cups may be prohibitive in resource-limited contexts, as illustrated in the excerpt from FGD two.

Portia (FGD 2): ...For our people, it would be difficult to spend R500 just like that. So, in other words, we do not have money. You will tell yourself, looking at the shelf, seeing it costs R300 because that is a whole week's grocery. I would rather take the R7 pad.

Lilian (FGD 2): Now that I know the cost, I cannot go into the shop as a first timer and see this on the shelf costing R160 and take it. I would rather buy myself pads because I do not know this thing.....

As noted by parents and guardians, the cost of menstrual cups served as a facilitator in the long run but an immediate barrier due to the upfront expenses. This underlined the nuanced decision-making process in menstrual product choices. Upon realising the cost of menstrual cups, a few participants were willing to go for a low-quality menstrual product. Their choices were limited to either having food on the table or preserving their dignity. Allocation of limited resources was a challenge experienced by parents and guardians, as suggested in the excerpt, therefore highlighting the economic trade-offs they have to make when considering their sexual and reproductive health needs and other aspects of life.

Limited MC knowledge and apprehension toward novelty

Menstrual cups were new to a significant number of parents, guardians, and the whole community at large, which made them apprehensive about usage. Parents and guardians expressed how they were still adapting to the arrival of something new to them, as demonstrated by Maria in FGD two.

Elizabeth (FGD 2): "... It is something new; they have never seen it before; they have never heard about it before. And now, we, as people who have been introduced to it, say to our friends, "I am telling you; I have this stuff, and I received it from certain people; they ask whether we have used it or not. My response would be only a day or two, and they say, "Okay, no, I am scared. You first use it, and then you come back to tell me".

To use and not to use a product in this excerpt context was a decision people made collectively rather than individually. This collective decision-making was vital in influencing whether to use MCs. Due to this, parents and guardians were anxious, doubtful, and sceptical about using insertable material. Uncertainty on potential outcomes unsettled them, as highlighted by Tyra.

Tyra (IDIs): I was sceptical about it being small and how is it going to fit. Can I do number one with it? Can I do number two with it? I was number two, and that was so scary. Because I thought if I push too hard, this thing will come out, and then I must work my way here in the poo to look for it.

Several participants had asked themselves these questions, reflecting their limited knowledge about menstrual cups. This became a challenging situation because at menarche, female parents and guardians seem to share the opinion that they ought to assist adolescent girls transition to be able to cater for their menstrual hygiene maintenance. As challenging as the processing stage was, other participants felt it was expected as they drew parallels from the more familiar narrative of demystifying HIV in the community, as highlighted in this excerpt in FGD2.

Portia: ...It is difficult to explain to the girls, so you must start with adults first. When that happens, I can share the information with my daughter, who is 17. She sees that I am using it and always asks and tells me she will not use this thing because it looks strange. So, now, thinking about those girls aged 10 and 11, it is difficult. Remember, we, as parents, are still closed off about sexuality, and we do not talk to our children about it. So, now I come home with this thing, and my daughter is 11 or 12, new to menstruation, and explain to her about it.... You will scare your child off because already, as an adult, this thing looks strange, and now you want the child to use it.

Lydia: the M-cup is something new to all of us. And you will see on my poster that I wrote "I have hope" because it is a new thing, but the start of good things. During the early days of HIV, we used to be afraid of people with HIV because we were not informed. Do you understand? But with time, we spoke with all these get-togethers and learnt more about it and what it entails. We realised after gaining more knowledge that we were not supposed to be afraid of infected people. Then, we also started to hug, love, and support them. Now, the same with the M-cup, if people outside are more empowered with information to know more and see it on social media or whatever, I think they will go for it....."

Parents and guardians struggled with accepting MC usage due to their limited knowledge. This, therefore, shaped their perspectives on usage. As female elders in their families, inadequate understanding of the cups and their usage frustrates them as their daughters rely on their wisdom and experience. As suggested by the excerpt above, their optimism needed to be supported by education.

Pragmatic Concerns about MC use

Parents and guardians had practical concerns about using menstrual cups based on their experience. Some participants expressed apprehension related to the size of the MC, as expressed by the excerpt from FGD one.

Tina: For me, I wrote that it is small. Small, and I am afraid that it will disappear here inside somewhere.

Kate: The same with me, the size of the cup for me, like, I feel it is big because compared to a tampon, it is like smaller. For me, it's a bigger thing to insert first, and I do not like touching my vagina, like scratching and taking and putting [laughs] so I am not comfortable.

These personal reflections made them infer whether adolescent girls used on whether they could be able to handle such complexities or not. They perceived that early adolescent girls would be unable to handle the hygiene level required for maintaining MCs as they require using one's hands to insert and remove, as highlighted in the excerpt from FGD two.

Miriam: ... because they are young, they will not be hygienic when handling. They will take it out with dirty hands. They are going to think consult and ask their friends when they think of what their mothers would have cation them, like taking it out after an hour or two. They will ask their friends to come and see as they will be taking it out and even ask others to help them take it out after tracking time.

Tamia: you must just try to keep it upright because if you put it in skew, it leaks. If it is upright, it does not spill.

Ashly: it will take a few exercises before you are comfortable with this. On your third day, you still will not be putting it in correctly.

These practical concerns shared by parents and guardians further increased their apprehension as it also often took time to learn insertion and removal skills without experiencing leakage. Materials used for menstrual cups unsettled other participants. From the individual interviews, Daphne shared how she was uncomfortable with the process and material used.

Daphne (IDIs): I think even the material, I know it is a silicone cup, I know its rubber, but I just felt like having it in my hand and thinking about me having to insert it... I did not feel comfortable... I did not even feel comfortable trying, now to go to the next step and say, "Okay, let me try it at least' I had it in my hand, I looked at it, I saw it was a rubber, I folded it, even the way I fold it, it still felt like big...."

Parents and guardians rely on personal experiences to inform and shape their perspectives. Concerns about sizing and materials reflect their level of understanding of menstrual cups, which might influence them to deter usage amongst adolescent girls. Due to the critical role, they play in adolescent girls' lives during menstruation, the process of inserting makes them apprehensive towards usage.

Cultural stigma and concerns about menstrual cups and breaking hymen

Parents and guardians shared concerns about menstrual cup usage having the ability to break the hymen, which is associated with loss of virginity. They feared that would encourage early sexual debut amongst adolescent girls. Tanya, one of the participants in FGD one, expressed her fear to the rest of the group and said:

Tanya (FGD1): "..... with my daughter, who is 14, the thought of her now having to open her mind to things that I would not want her to explore, like now, is difficult. Like having to go through that, the thought of having to insert and all those things. I am not comfortable with it".

Participants further reflected on the importance of virginity in De Doorns, with some sharing how the socio-cultural and religious significance of virginity is deeply intertwined with notions of honour and purity. Mirriam, in FGD two, shared her experience being a mother of three and how virginity was important in her family as a Black African religious woman.

Miriam: "I have three girls and it is important for me, aged 27, 24, and 19. I also think that one day, when they leave the house, someone will marry my daughter right. As a Black woman from the black tribe, I feel it is very important that they are virgins. As for my spiritual belief that I, my children, should remain pure.

Dorika: ... the world is very fast these days. So, it is not about virginity anymore....

Meaghan: Some children are sexually active at an earlier age, some children later, but sometimes it does depend on you as the parents.

Parents and guardians from the excerpt highlight the importance of virginity, which can vary across communities and is often intertwined with family dynamics and cultural values. Diane, a participant who identified as Xhosa during individual interviews, shared her perspective as virginity testing was part of their tradition.

Diane (IDIs): "... because as soon as that "eye" is broken, it is bad. My daughter, when she visits my side of the family, my mother checks to see if her "eye" is closed. She always tells her grandmother that her eye is still closed, and my mother often confirms it for herself rather than taking her word. My daughter always tells her that she has not yet started having sex..."

Based on the excerpt, one can observe that in the participant's family, virginity testing was regarded as necessary, which may influence usage amongst adolescent girls. In South Africa, post-apartheid, racial categories were classified, including Black Africans, Whites, Indians, and Coloureds in no order of importance. This participant was married to someone who identifies as Coloured, and virginity, as perceived by the participant, was not perceived as being as crucial for marriages as within the Xhosa community.

Discussion

This study sought to explore parents' and guardians' perceived facilitators and barriers to MC usage amongst adolescent girls. Participants identified various perceived facilitating factors and barriers to menstrual cups. Parents and guardians perceived menstrual cups to uphold dignity, cost-effectiveness, and sustainability. Some were of the view that the choice of menstrual products should align with maturity levels, as they were unfamiliar with menstrual cups. Focus group discussions provided the platform for sharing menstrual cup knowledge amongst peers. This, in turn, shaped and influenced parents' and guardians' perspectives and willingness to consider their usage and that of adolescent girls. Despite the facilitating factors, parents and guardians felt ordinary people would not afford the once-off payment of costs. In addition, as the gatekeepers of menstrual information and knowledge, they felt inadequate to provide such support to adolescent girls as they were unfamiliar with menstrual cups. This lack of knowledge resulted in them having reservations and concerns about menstrual cup size and material used, as well as their ability to break the hymen, which is associated with loss of virginity. The research aimed to contribute a nuanced understanding of parents' and guardians' perspectives focusing on menstrual cup introduction, acceptance and rejection as guided by the Diffusion of Innovation Theory (28).

Diffusion of Innovation is a valuable framework for mapping out how new interventions are introduced, gradually understood, accepted, or rejected. When individuals are exposed to a new intervention, such as menstrual cups, need and relevance are prior conditions which are crucial for people to expose themselves to the new idea (15). Findings revealed that individual parents and guardians who were part of the same social system in De Doorns and of similar socio-economic status and beliefs differed in their readiness to accept menstrual cup usage for AGYW under their care, which also impacted the exchange of information about menstrual cups.

In exploring the facilitators and barriers to menstrual cup adoption, several themes emerged. Knowledge was pivotal in parents and guardians' willingness to support adolescent girls using menstrual cups, yet participants had limited understanding, leading to anxiety. Findings indicated parental uncertainty, which could have been alleviated by closing the information gap (15). Some believed adolescents should freely choose menstrual products based on maturity. Early adopters showcased how differing levels of knowledge shaped perspectives and willingness to support, embracing cups with their daughters' approval.

While data suggested parental support for autonomy, the study revealed nuanced realities. Parents and guardians admitted their lack of knowledge made them feel inadequate in assisting their daughters. Literature highlights similar concerns in rural Uganda and Kenya, where limited knowledge led to parental worries (7,19). Participants here expressed concerns about their role as custodians of menstruation in their families and community (3,13,19). This challenges the idea of a one-size-fits-all approach to menstrual products and autonomy. It emphasizes the need for comprehensive exploration of factors influencing choice. What's clear is the importance of providing women and girls with adequate information to make informed decisions, which could increase demand for products like menstrual cups (28,29).

Menstrual cups were perceived as cost-effective, convenient, and leakage-reducing, which contributed to their relative advantage over other menstrual products. Peer interactions facilitated communication and positive testimonies, influencing the decision-making process, and encouraging willingness amongst parents and guardians for adolescent girls to utilise MCs. This aligns with findings from studies conducted in South Africa, where participants expressed willingness to continue using menstrual cups due to their relative advantages over other menstrual products (2,4).

The literature further supports this claim as menstrual cups collect more blood and could be used for ten years (3,28,29). This willingness to adopt was propelled through peer interactions, as highlighted in the study, and aligns with literature findings in Kenya and Uganda (7,17,30).

However, the cost of menstrual cups emerged as a barrier for some families, particularly when considering the sustained expenses of sanitary pads versus the one-time investment in reusable alternatives. This is consistent with previous research by Van Eijk, which highlighted the challenges associated with menstrual cup accessibility and sustainability, especially among socio-economically disadvantaged populations (16). A few participants in this study were willing to choose sanitary pads of low quality due to the once-off costs of menstrual cups. This raises questions about menstrual cup accessibility and sustainability as participants used free MCs. Full adoption in this context is challenging, as menstrual cups do not align with the socio-economic characteristics of AGYW in De Doorns (15). However, interestingly, in one-on-one, in-depth interviews, menstrual cups' relative advantages outweighed and justified the cost. This therefore affected parents and guardians' willingness to support adolescent girls' usage of MCs.

Furthermore, the study uncovered nuanced realities regarding parents' and guardians' attitudes towards menstrual cups, shaped by cultural stigma and concerns around virginity. The perceived incompatibility of menstrual cups with existing practices and values, particularly regarding virginity, influenced decision-making among parents and guardians. Virginity significance in this study was based on people's religious and cultural values, which differed by families. This was highlighted by a participant who perceived virginity to be of importance amongst the Xhosa community as she was married to a man who identified as Coloured as per the racial classifications in South Africa post-Apartheid (9,31–33). Studies on menstrual cups among adolescent girls in Sub-Saharan Africa have been limited due to the perceived importance of virginity, which is closely associated with breaking or stretching of the hymen (3). This is supported by studies conducted in Sub-Saharan Africa, India, and Nepal, which highlighted the significance of cultural beliefs in shaping attitudes towards menstrual hygiene practices (3,18,34,35).

This highlights the importance of considering cultural variations in attitudes towards menstrual hygiene practices, as these can significantly impact acceptability and usage. By understanding and addressing these facilitators and barriers, stakeholders can work towards promoting the widespread acceptance and usage of menstrual cups as a sustainable and dignified menstrual hygiene solution.

In this study, it may be challenging to consider the confirmation stage of the theory as that would require a longitudinal study to confirm.

Implications and recommendations

This study provides insights into facilitators and barriers of menstrual cup usage as perceived by parents and guardians, which informs interventions on improving adolescent girls' menstrual health and hygiene. This study suggests what should be done when adopting menstrual material alternatives like menstrual cups. One of this study's significant findings highlights how knowledge was limited among parents, and guardians who are the custodians and gatekeepers of menstruation. School programs, companies manufacturing menstrual cups, and organisations donating them should understand parents' perspectives to ensure they are embraced and fully adopted. Knowledge was an overarching limitation for parents and guardians; hence, there is a need to increase the knowledge sources to inform teachers and nurses' trust. There is need for adequate training for parents and guardians to ensure they are able to offer support to adolescent girls if they opt to utilise MCs.

There is a need for organisations and manufacturers to increase knowledge sources for parents and guardians to understand MCs. As parents and guardians were persuaded by their relative advantages, it is viable to consider improving the knowledge intake, as giving people free menstrual cups is not sustainable. As the adoption decision was based on pragmatic concerns, organisations and companies that manufacture menstrual cups should consider parents' and guardians' concerns and redesign to meet adolescent girls' needs, as sizing was an issue. At this point, information to support continued adoption is still limited. We can speculate that continued adoption is likely to be influenced by the availability and affordability of menstrual cups, particularly given the socio-economic context in De Doorns. One, therefore, would need to do a longitudinal study to establish continued adoption over time, which we still need to do. A longitudinal study would capture dynamic changes over time and understanding the complex interplay of factors influencing user behaviour. In addition, it is imperative to conduct a dedicated study focusing on AGYW to elucidate their perspectives on usage. Such research would offer valuable insights into the unique needs and preferences of this demographic, thereby informing targeted interventions and strategies for effective implementation.

Limitations of the study

Though participants spoke some English, their fluency was limited, so the researcher relied on a translator. In the process, it is possible that some nuances may have been missed, for instance,

meanings contained in idiomatic expressions of the original language and specifically for a few participants who mixed Afrikaans with isiXhosa. Another limitation of this study is that data was collected at a single point due to time constraints. A longitudinal study would help track how menstrual cups are adopted (or not) over time. Further, findings from a small qualitative study may need more generalisations in other contexts. Additional studies in other low-income contexts may help establish potential comparisons.

Conclusion

It is crucial to consider the opinions of parents and guardians when discussing the menstrual materials used by adolescent girls. Through our study and examination of existing literature, we have identified several key findings and insights related to their perspective. We found that menstrual cups were not common in De Doorns, and parents and guardians needed to learn about them, which made them apprehensive towards their usage despite their popularity due to their convenience and cost-effectiveness. Additionally, parents and guardians were concerned about the informational and practical complexity of menstrual cups, which they believed could break the hymen associated with virginity. Addressing these concerns is necessary for alleviating knowledge gaps among parents and guardians. This study highlights the importance of informing parents and guardians about production methods and menstrual cup materials. It also emphasises the need to enhance public awareness of menstrual cups and other products available, including their benefits. Menstrual cups have the potential to be fully adopted in communities as an alternative solution for adolescent girls' menstrual health. Schools, organisations, healthcare providers, and manufacturers should work together to provide menstrual education and promote menstrual cup use. Our study contributes to the ongoing dialogue on menstrual health and hygiene for adolescent girls, highlighting the importance of parents' and guardians' voices. It will serve as a foundation for further investigations and policy development to improve menstrual dignity and health for adolescent girls.

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Appendices

Appendix A: Focus Group Discussion Schedule

The consent procedure will occur prior to the focus group discussion.

An overview of the study will be shared with the participants before the discussion.

Draw up a mutually agreed upon confidentiality contract.

Voluntary participation will be clarified before the discussion session.

Trust-building game in pairs (What do you like about your body?)

Menstrual cycle reflection (menstrual cycle drawing with a red marker symbolising menstrual blood). What is essential when choosing menstrual materials?

Reflection on our adolescent memory by outlining a small body on a flipchart sheet (Choose a name for your outline)

Internal processing (where are menstrual cups inserted and placed) How are they used?

Can we reflect on our thoughts on menstrual cups before using them?

What are your initial concerns about using menstrual cups?

External processing (By using colour to outline the body, what do your neighbours, friends, and family think about menstrual cups?

What can stop adolescent girls from using menstrual cups?

What would your neighbours, friends and family think of an adolescent girl who uses a menstrual cup?

How can adolescent girls use menstrual cups during their periods?

Summary

Why do you think women use menstrual cups?

Can we share our thoughts/feelings when conducting this exercise?

Appendix B: Semi-structured one-on-one individual interview schedule

(Estimated time 35 mins)

The consent procedure will occur prior to the focus group discussion.

An overview of the study will be shared with the participants before the discussion. Voluntary participation will be clarified before the discussion session.

Study participant's demographic information.

Can you tell me your name?
How old are you?
Where are you from?
Where do you live?
What is your level of education?
If you work, what do you do?
If you have children, how many are adolescent menstruating girls?

I will start by asking you about your monthly period experience. Can you tell me about your menstrual cycle?

What materials do you use to prevent period blood from staining your clothes? Can you describe how you use it?

Now, I will ask you what you know and think and what others think of menstrual cups.

Can you tell me if you have ever used a menstrual cup before? Could you share with me your experience using them?

Can you tell me about your initial thoughts on the onset of seeing a menstrual cup? What risk did you expect when using menstrual cups?

What do your female neighbours, friends and other family members think about menstrual cups that differ from what you think?

Now, I will ask about the reasons why people use menstrual cups. In your view, how easy is it to use menstrual cups?

How efficient are menstrual cups compared to other sanitary materials to prevent staining your clothes during monthly periods?

Now, I will ask your thoughts on adolescent girls using menstrual cups.

What do you think about adolescent girls using menstrual cups during their monthly periods? Can you share any risks that may stop them from using menstrual cups?

Now, I will ask you about Perceptions of how adolescent girls can use menstrual cups.

Can you share with me what you think can be done to help adolescent girls use menstrual cups?

Conclusions.

We have come to the end of our interview. Thank you for the time you spent on this interview. Do you have any questions for me?

Appendix C: General Information sheet

Title of the study: An Exploration of Menstrual Cup Usage amongst Adolescent Girls from Parents and Guardians' Perspective in De Doorns Cape Winelands.

Lead Researcher: Jennifer Githaiga

Email: jennifer.githaiga@uct.ac.za Phone: 021406709

Co-lead Researcher: Shehani Perera

Email: prrshe004@myuct.ac.za Phone: 0214056300

Student Researcher: Natasha Ruya

Email: ryxnat002@myuct.ac.za Phone 0656559924

Contact Information: Human Research Ethics Committee (HREC), Faculty of Health Science UCT

Email: marc.blockman@uct.ac.za Phone: 0214066338

Before you decide to be one of the study participants, you must understand why this study is being done through this sheet. If you need more information, feel free to ask.

The purpose of this study: We invite you to participate in this research study to understand your perspectives on using menstrual cups during their monthly periods as parents and guardians of adolescent girls. You will be asked questions on what you know, think, feel, and what others think about adolescent girls using menstrual cups in the community.

Why have I been invited? As parents and guardians, you have an essential role during your daughters' monthly periods, so as researchers, we would like to understand your thoughts and views of what good or bad things about using menstrual cups for adolescent girls. We value your thoughts and

experience in understanding this topic, which helps us understand the issue more as researchers.

Do I have to take part? What will happen if I want to stop the study? Participation in this study is strictly voluntary. If you choose to participate, we will be discussing your perspective towards the use of menstrual cups among adolescent girls. Responses you share during our discussions will be significant to the study. Discussing menstrual cup use amongst adolescent girls could be uncomfortable, so you are free to request to stop without any explanation during any time of the individual interview/focus group discussion. You may also refuse to answer questions that make you uncomfortable or do not wish to answer or ask to move to the next question. If you have questions or concerns, feel free to stop the interview and ask for more clarification from the research team. Following discussions during and after the activity, you can withdraw your answer anytime. If you feel upset or stressed during the session or after the discussion, let one of the researchers know so that we may refer you to a counsellor.

Are there any possible risks from taking part? Will the things I share be kept confidential?

This study does not have any severe disadvantages of taking part. However, as some discussions will be conducted in a group, confidentiality cannot be guaranteed. However, we will ensure that all participants in the group know that they should not talk about discussions shared with other people. Any information obtained in this study will be shared with your permission and approval. We may use direct quotes or summaries from your discussion, but they will be anonymous; hence, you will not be identified by name. We may use a fake name (pseudonym) to refer to your words. Your name may be used if you voluntarily request it be used. Researchers will need to listen to your discussion later for better understanding, so we need to record the discussion. If you feel uncomfortable in the middle of the session, you are allowed to stop the recording. Any written and audio recordings will be protected in a password-protected password.

What are the possible benefits of taking part?

Your participation in this study might not have direct benefits; however, as parents and guardians, you have a critical role during adolescent girls' monthly periods. Thus, we would like to understand your thoughts and perspectives on key drivers and challenges that may affect adolescent girls' decision to use or not use menstrual cups. We value your opinions and experience in understanding this topic, which helps us understand the issue more as researchers.

Will I be reimbursed?

There will be no monetary reimbursements. However, refreshments will be provided at every focus group discussion/interview.

What happens at the end of the study?

At the end of the study, the research findings will be presented to you. After finalising the research findings, we will contact you to share them. This research will contribute to fulfilling the education requirement of my master's in public health degree. May you be reassured that you will not be identifiable in any publication or report.

Thank you for your time, for reading this information sheet, and for considering participating in this study!

Appendix D: Informed consent for Focus group discussions.

Title: An exploration of parents' and guardians' perspectives on menstrual cup usage amongst adolescent girls in De Doorns Cape Winelands.

Lead Researcher: Jennifer Githaiga

Email: jennifer.githaiga@uct.ac.za Phone: 021406709

Co-lead Researcher: Shehani Perera

Email: prrshe004@myuct.ac.za Phone: 0214056300

Student Researcher: Natasha Ruya

Email: ryxnat002@myuct.ac.za Phone 0656559924

Contact Information: Human Research Ethics Committee (HREC), Faculty of Health Science UCT

Email: marc.blockman@uct.ac.za Phone: 0214066338

Before you decide to be one of the study participants, you must understand why this study is being done through this sheet. If you need more information, feel free to ask.

The purpose of this study: We invite you to participate in this research study to understand your perspectives on using menstrual cups during their monthly periods as parents and guardians of adolescent girls. You will be asked questions on what you know, think, feel, and think about adolescent girls using menstrual cups in the community.

Why have I been invited? As parents and guardians, you have an essential role during your daughters' monthly periods, so as researchers, we would like to understand your thoughts and views of what good or bad things about using menstrual cups for adolescent girls. We value your thoughts and

experience in understanding this topic, which helps us understand the issue more as researchers. Discussing menstrual cup use amongst adolescent girls could be uncomfortable, so you are free to request to stop without any explanation. You are also allowed to refuse to answer questions that make you uncomfortable or just not wish to answer or ask to move to the next question. If by any chance you have questions or concerns, feel free to stop the interview and ask for more clarification from the research team. Following discussions during and after the activity, you can withdraw your answer anytime. If you feel upset or stressed during the session or after the discussion, let one of the researchers know so that we may refer you to a counsellor.

Confidentiality and disclosure of information: As the discussion will be conducted in a group, confidentiality cannot be guaranteed. However, we will ensure that all participants in the group know that they should not talk about discussions shared with other people. Any information obtained in this study will be shared with your permission and approval. We may use direct quotes or summaries from your discussion, but they will be anonymous; hence, you will not be identified by name. We may use a fake name (pseudonym) to refer to your words. Your name may be used if you voluntarily request it be used. Researchers will need to listen to your discussion later for better understanding, so we need to record the discussion. If you feel uncomfortable in the middle of the session, you are allowed to stop the recording. Any written and audio recordings will be protected in a password-protected password.

Thank you for your time and for agreeing to participate in this discussion! Consent:

Signature of Participant

Name of participant Date:

Appendix E: Informed consent for Semi-structured individual interviews.

Title: An exploration of parents' and guardians' perspectives on menstrual cup usage amongst adolescent girls in De Doorns Cape Winelands.

Lead Researcher: Jennifer Githaiga

Email: jennifer.githaiga@uct.ac.za Phone: 021406709

Co-lead Researcher: Shehani Perera

Email: prrshe004@myuct.ac.za Phone: 0214056300

Student Researcher: Natasha Ruya

Email: ryxnat002@myuct.ac.za Phone 0656559924

Contact Information: Human Research Ethics Committee (HREC), Faculty of Health Science UCT

Email: marc.blockman@uct.ac.za Phone: 0214066338

Before you decide to be one of the study participants, you must understand why this study is being done through this sheet. If you need more information, feel free to ask.

The purpose of this study: We invite you to participate in this research study to understand parents' and guardians' perspectives on adolescent girls' use of menstrual cups during their monthly periods. You will be asked questions on what you know, think, feel, and what others might think about adolescent girls using menstrual cups in the community.

Why have I been invited? As parents and guardians, you have an essential role during your daughters' monthly periods, so as researchers, we would like to understand your thoughts and views of what good or bad things about using menstrual cups for adolescent girls. We value your thoughts and experience in understanding this topic, which helps us understand the issue more as researchers.

Discussing menstrual cup use amongst adolescents could be uncomfortable, so you are free to request to stop participating in the study without any explanation. You are also allowed to refuse to answer questions that make you uncomfortable or just not wish to answer or ask to move to the next question. If by any chance you have questions or concerns, feel free to stop the interview and ask for more clarification from the research team. Following discussions during and after the activity, you can withdraw your answer anytime. If you feel upset or stressed during the session or after the discussion, let one of the researchers know so that we may refer you to a counsellor.

Confidentiality and disclosure of information: Any information obtained in this study will be shared with your permission and approval. We may use direct quotes or summaries from your discussion, but they will be anonymous; hence, you will not be identified by name. We may use a fake name (pseudonyms) to refer to your words. Your name may be used if you voluntarily request it be used. Researchers will need to listen to your discussion later for better understanding, so we need to record the discussion. If you feel uncomfortable in the middle of the session, you are allowed to stop the recording. Any written and audio recordings will be protected in a password-protected password.

Thank you for your time and for agreeing to participate in this discussion! Consent:

Signature of Participant -----

Name of participant Date:-----

APPENDIX F: Study Budget

Item	Cost per unit	Number of units	Total
Fieldworker	-	-	Researchers own time
Transport to the study site. and accommodation	R700 per visit	10 visits	R7000
Photocopying/printing information sheets, cover, and consent forms	R2 per page	2 X3 pages X 20 2 X 2 pages X 20 2 X 2 pages X 8	R280
Printing interview schedules and focus group discussion schedules	R2 per page	2 Pages X 20 2 pages X 8	R112
Additional stationery	R 300	1	R300
Refreshments for participants	R100	20	R2000
Translation services	R25/Minute	45 minutes X 8	R9000
Audio recorder	649.90	1	R649.90
transcription	R25/Minute	120 minutes X 3	R9000
TOTAL			R 28, 341.9

APPENDIX G: Ethics Approval



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room 45 E-52-E-Floor- Old Main Building
Grootte Schuur Hospital
Observatory 7925
Telephone (021) 406 5492
Email: hrec-submissions@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

22 August 2022

HREC REF:474/2022

Dr J Githaiga

Division of social and Behavioural Sciences
FHS
Email: Jennifer.githaiga@uct.ac.za
Student: Ryxnat002@myuct.ac.za

Dear Dr Githaiga

PROJECT TITLE : FACILITATORS AND BARRIERS OF MENTRUAL CUP USAGE AMONGST ADOLESCENT GIRLS: PARENTS AND GUARDIANS PERSPECTIVES IN CAPE WINELANDS (MASTER OF PUBLIC HEALTH - MS NATASHA RUYA)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee (HREC) for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30 August 2023.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: Ms Natasha Ruya will also be involved in this study.

Please quote the HREC REF 474/2022 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely

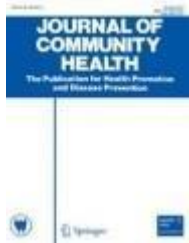
Signed by candidate

PROFESSOR M BLOCKMAN
CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637, Institutional Review Board (IRB) number:
IRB00001938 NHREC-registration number: REC-210208-007

HREC.REF474.2022

Appendix H: Journal of Community Health-Instruction for authors



[Journal of Community Health](#)

The Publication for Health Promotion and Disease Prevention Instructions for Authors

Manuscript Submission

Manuscript Submission

Submission of a manuscript implies: that the work described has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors, if any, as well as by the responsible authorities – tacitly or explicitly – at the institute where the work has been carried out. The publisher will not be held legally responsible should there be any claims for compensation.

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Online Submission

Please follow the hyperlink “Submit manuscript” and upload all of your manuscript files following the instructions given on the screen.

Source Files

Please ensure you provide all relevant editable source files at every submission and revision. Failing to submit a complete set of editable source files will result in your article not being considered for review. For your manuscript text please always submit in common word processing formats such as .docx or LaTeX.

Title Page

Please make sure your title page contains the following information.

Title

The title should be concise and informative.

Author information

The name(s) of the author(s)

The affiliation(s) of the author(s), i.e. institution, (department), city, (state), country

A clear indication and an active e-mail address of the corresponding author

If available, the 16-digit [ORCID](#) of the author(s)

If address information is provided with the affiliation(s) it will also be published.

For authors that are (temporarily) unaffiliated we will only capture their city and country of residence, not their e-mail address unless specifically requested.

Large Language Models (LLMs), such as [ChatGPT](#), do not currently satisfy our [authorship criteria](#).

Notably an attribution of authorship carries with it accountability for the work, which cannot be effectively applied to LLMs. Use of an LLM should be properly documented in the Methods section (and if a Methods section is not available, in a suitable alternative part) of the manuscript.

Abstract

Please provide an abstract of 150 to 250 words. The abstract should not contain any undefined abbreviations or unspecified references.

For life science journals only (when applicable)

Trial registration number and date of registration for prospectively registered trials

Trial registration number and date of registration, followed by “retrospectively registered”, for retrospectively registered trials.

Keywords

Please provide 4 to 6 keywords which can be used for indexing purposes.

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The following statements should be included under the heading "Statements and Declarations" for inclusion in the published paper. Please note that submissions that do not include relevant declarations will be returned as incomplete.

Competing Interests: Authors are required to disclose financial or non-financial interests that are directly or indirectly related to the work submitted for publication. Please refer to “Competing Interests and Funding” below for more information on how to complete this section.

Please see the relevant sections in the submission guidelines for further information as well as various examples of wording. Please revise/customize the sample statements according to your own needs.

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Manuscripts should be submitted in Word.

Use a normal, plain font (e.g., 10-point Times Roman) for text.

Use italics for emphasis.

Use the automatic page numbering function to number the pages.

Do not use field functions.

Use tab stops or other commands for indents, not the space bar.

Use the table function, not spreadsheets, to make tables.

Use the equation editor or Math Type for equations.

Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

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Please use no more than three levels of displayed headings.

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Abbreviations should be defined at first mention and used consistently thereafter.

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Footnotes can be used to give additional information, which may include the citation of a reference included in the reference list. They should not consist solely of a reference citation, and they should never include the bibliographic details of a reference. They should also not contain any figures or tables.

Footnotes to the text are numbered consecutively; those to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data). Footnotes to the title or the authors of the article are not given reference symbols.

Always use footnotes instead of endnotes.

Acknowledgments

Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

References

Citation

Reference citations in the text should be identified by numbers in square brackets. Some examples:

Negotiation research spans many disciplines [3].

This result was later contradicted by Becker and Seligman [5].

This effect has been widely studied [1-3, 7].

Authors are encouraged to follow official APA version 7 guidelines on the number of authors included in reference list entries (i.e., include all authors up to 20; for larger groups, give the first 19 names followed by an ellipsis and the final author's name). However, if authors shorten the author group by using et al., this will be retained.

Reference list

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Journal article

Grady, J. S., Her, M., Moreno, G., Perez, C., & Yelinek, J. (2019). Emotions in storybooks: A comparison of storybooks that represent ethnic and racial groups in the United States. *Psychology of Popular Media Culture*, 8(3), 207–217. <https://doi.org/10.1037/ppm0000185>

Article by DOI

Hong, I., Knox, S., Pryor, L., Mroz, T. M., Graham, J., Shields, M. F., & Reistetter, T. A. (2020). Is referral to home health rehabilitation following inpatient rehabilitation facility associated with 90-day hospital readmission for adult patients with stroke? *American Journal of Physical Medicine & Rehabilitation*. Advance online publication. <https://doi.org/10.1097/PHM.0000000000001435>

Book

Sapolsky, R. M. (2017). *Behave: The biology of humans at our best and worst*. Penguin Books.

Book chapter

Dillard, J. P. (2020). Currents in the study of persuasion. In M. B. Oliver, A. A. Raney, & J. Bryant (Eds.), *Media effects: Advances in theory and research* (4th ed., pp. 115–129). Routledge.

Online document

Fagan, J. (2019, March 25). *Nursing clinical brain*. OER Commons. Retrieved January 7, 2020, from <https://www.oercommons.org/authoring/53029-nursing-clinical-brain/view>

Tables

All tables are to be numbered using Arabic numerals.

Tables should always be cited in text in consecutive numerical order.

For each table, please supply a table caption (title) explaining the components of the table.

Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.

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