Review Article

Caregivers' knowledge, attitude, and practice regarding diarrhoea in children under five years old in sub-Saharan Africa: an integrative narrative review

ABSTRACT

Background: Diarrhoeal diseases constitute a significant burden on the health and growth of children the world over. Globally, diarrhoeal conditions remain the second leading cause of death among children under 5. Knowledge, attitudes and practice of caregivers are at the heart of diarrhoeal disease prevention and proper management. This study, therefore, seeks to empirically explore available literature on the topic to help present a broader picture of what issues are addressed concerning the knowledge, attitude and practice of caregivers on diarrhoea in children under five years of age in sub-Saharan Africa.

Objective: This review aimed to assess caregivers' knowledge, attitude, and practice regarding diarrhoea in children under five years old in sub-Saharan Africa, as discussed in the literature.

Design: Integrative narrative review

Data Sources: The review saw an extensive search on two electronic databases. Search results were screened using inclusion and exclusion criteria. At the end of the screening, 37 studies were included in the review.

Review method: Inclusion criteria: Only studies whose focus was on caregivers' knowledge, attitude and practice relating to diarrhoea in children under five were included. Also, only publications reported in the English Language were considered, and publications must have been between 2010-2020. Additionally, the methodological quality of studies was assessed using the Down & Black (1998) checklist for quality evaluation in a systematic review.

Results: In this review, it emerged that studies in Sub-Saharan Africa indicate that caregivers display poor overall knowledge about diarrhoea. Also, the attitudes of caregivers towards diarrhoea prevention and treatment was low in many studies. On care practices, prevention practices, and management/treatment practices, including ORS and Zinc usage, were mainly reported to be quiet.

Conclusions: The review concluded that there are poor levels of knowledge, attitude and practice of managing diarrhoea among caregivers of children under five (5) years of age in

sub-Saharan Africa. The researchers recommended continuous health education to address knowledge gaps of mothers about diarrhoea, its prevention and treatment according to international standards.

Keywords: Diarrhoea, under-five children, caregivers, management/treatment practices

1. Introduction

Diarrhoeal diseases constitute a significant burden on the health and growth of children the world over. The World Health Organization defines diarrhoea as the passage of three or more loose or watery stools per day, or stools more frequent than expected for a child(Levine, Walson, Atlas, Lamberti, & Pavlinac, 2017; WHO, 2004) (WHO & UNICEF, 2004). Nearly one in five deaths of a child, about 1.5 million each year, is due to the disease of diarrhoea(Löfgren et al., 2012; Tambe, Nzefa, & Nicoline, 2015) (Ahs et al., 2004). Diarrhoea kills more young children than malaria, HIV/AIDS, and measles combined(Popoola & Mchunu, 2015) (Ahs et al., 2004). Diarrhoea has been among the top mortality conditions (the second leading cause of death) in children under five globally for some time (WHO, 2005, 2013).

UNICEF (2016) reported that globally, a significant part of children under five years old and infant mortality rates had been linked to diarrhoea – accounting for 9% of childhood mortality worldwide – with about 1,400 children dying every day in 2015 alone. UNICEF further noted that 70% of diarrhoea deaths occurred among children less than two years old in Sub-Saharan Africa and South Asia due to poor environmental conditions in those regions. Like many conditions such as malaria, the developing world is disproportionally affected. The number of diagnosed cases of diarrhoea in Africa has increased over the years. In Africa, it has been estimated that every child has five episodes of diarrhoea per year and that 800,000 children die each year from diarrhoea and dehydration(Alambo, 2015; Organization, 2009) (WHO, 2009). Also, UNICEF in 2012 reported that In Africa, more than four-fifths of all under-five deaths (82%) were caused by diarrheal diseases(Murray & Newby, 2012) (UNICEF, 2012). Death is not the only negative outcome of diarrhoeal diseases. Diarrhoea can retard growth and development, weaken immunity and make children more susceptible to other disease conditions. Diarrhoea is considered the leading cause of malnutrition, dehydration and death among children under-five years (WHO, 2017). It affects both the cognitive and physical development of young children(Christensen, Schieve, Devine, & Drews-Botsch, 2014) (Guerrant et al., 1999).

Moreover, diarrhoea affects the quality of life of a family as a whole (Murray et al., 2014), as it weighs heavily on family resources like time and money. Diarrhoea is not lethal in and of itself. Often, the misdirected approach towards its management and prevention leads to a high degree of severe dehydration and death (Mumtaz et al., 2014; Hackett et al., 2015). Due to diarrhoea's seriousness in children under five, cost-effective interventions for diarrhoeal diseases abound; protective, preventive and curative management measures are essential. Protective interventions keep children healthy and free of diarrhoeal disease. Protective measures include exclusive breastfeeding, adequate complementary feeding, continued breastfeeding and vitamin A supplementation. Preventative interventions are also primary prevention; they seek to stop disease transmission and prevent children from getting infected and becoming ill. They include immunisation, safe drinking water, sanitation and hygiene. Treatment interventions are secondary prevention measures and thus cure children of diarrhoea, ensure survival, and prevent fatalities or complications. They include improved care-seeking at qualified and appropriate facilities and treatment with Oral Rehydration Salts (ORS) and zinc (Bhutta et al., 2013; UNICEF, 2016).

The primary caregivers have a significant role in the prevention and treatment of diarrhoea – their knowledge, attitudes and practices determine the quality of care they provide to children for survival and development(Mosweu, 2018) (Ansari et al., 2009). Despite how preventable diarrhoea is, home-based management of diarrhoea among caregivers of under-five children has been noted to be inadequate, especially in developing countries due to the inadequacy of knowledge, attitude and practice gaps (Ogunrinde et al., 2012). In studies on the continent, good awareness and knowledge on diarrhoea have been reported in Nigeria (Asiegbu et al., 2017; Raji et al., 2017; Ogban et al., 2020), Ethiopia (Workie et al., 2018) and Botswana (Lekoto, 2015; Mosweu, 2018). Insufficient knowledge and practice of home management of diarrhoea were reported in Ghana (Acheampong, 2013; Anim-Larbi, 2017), Nigeria (Ogunrinde et al., 2012; Okoh & Hart, 2014; Kung'u et al., 2015), Ethiopia (Merga & Alemayehu, 2015) and Lesotho (Adeleke & Mhlaba, 2019).

Undoubtedly, caregivers' knowledge, attitudes, and practice are at the heart of diarrhoeal disease prevention and proper management. This study, therefore, seeks to empirically explore available literature on the topic to help present a broader picture of what issues are addressed concerning the knowledge, attitude and practice of caregivers on diarrhoea in children under five years of age in sub-Saharan Africa.

2. Method

2.1 Design

An integrative review approach was employed for this study, and both qualitative and quantitative studies were included. The Arksey & O'Malley (2005) framework was used for conducting scoping reviews that guided the study. The framework was selected because it agrees with the narrative approach and fits the aims of this review.

2.2 Search methods and study selection

Arksey & O'Malley's framework was used to guide the search, screening and selection of literature. Two electronic databases: PUBMED and GOOGLE SCHOLAR. An initial scoping search was conducted on the Google search engine to identify optimal search terms. The Population, Exposure and Outcome Framework (Bettany-Saltikov, 2012) was used to organise the search terms by key concepts per the review's objectives. A comprehensive search strategy was developed using the Boolean search operators "OR" and "AND" to combine terms and concepts, respectively (Table 1). Online abstracts and titles of relevant journals (for example, Biomed Central, Hindawi and ResearchGate) and Open Access Theses and Dissertations (published/unpublished) were searched. A manual search of all reference lists of included studies was done to identify possibly missed literature to determine additional papers via further searches on the databases. The first two authors in the paper conducted a literature search and screened potential studies. Final included studies were agreed upon by all three, and where disputes existed, they were referred to the forth author for redress. Four inclusion criteria (Table 2) guided the study selection. Searches were limited by year, language and jurisdiction.

2.3 Quality appraisal, data extraction and synthesis

Using an adaptation of the Downs & Black (1998) checklist for quality evaluation in a systematic review, the methodological quality of selected studies was appraised before inclusion. The Downs & Black (1998) evaluation checklist contains 27 'yes'-or 'no' questions across five sections. The tool provides the quality score of each paper per the evaluation questions. The overall possible quality score for an article is 30 points. For this study, nine questions were selected from the five sections and used to evaluate the studies included in this review (Table 3). A point was given were a study answered a question in the affirmative. Hence the maximum numeric quality score in this study was 9. For the interpretation of scores, examinations were graded as 'good quality (≥ 8 points), 'fair quality' (≥ 6 ≤ 7) and 'low quality (≤ 5). Data were extracted on the study objectives, methodology/design, participants and main results, including statistical tests.

Results

3.1 Search Outcome

An electronic search was done on two databases using the search strings as identified. Search results revealed a total of 133,861 articles. Using the screening process to read titles and abstracts, 1361 articles were screened. After removing duplicates and applying the inclusion and exclusion criteria, 37 studies published between 2010 and July 2020 were selected for the scoping review. The PRISMA flow diagram (Figure 1) presents the search and inclusion process

3.2 Study Characteristics and methodological quality

Resulting from an electronic search of two databases and other sources, a total of 37 studies published between January 2010 and July 2020 were selected for the scoping review. The studies comprised of thirty-two (32) quantitative studies, four mixed-methods and two qualitative studies. Table 4 contains a summary of included studies

The studies included were carried out in several developing countries, mainly in Sub-Saharan Africa. Eighteen were from Nigeria, five from Ethiopia, two from Ghana, Burkina Faso, Gambia and Botswana. Kenya, Tanzania, Lesotho, Sierra Leone, South Africa and Senegal had one study each. All the studies were cross-sectional in design.

Most of the included studies provided little or no information on sample size calculation, sampling, enrolment patterns, respondents who declined participation, and the response rates. These created doubts about the representativeness of the samples interviewed for the studies. One mixed-method study failed to provide the sample size in the publication (Oladipo et al., 2015). Few studies (Ogunbiyi & Akinyele, 2010; Acheampong, 2013; Tobin et al., 2014; Anim-Larbi, 2017; Bello et al., 2017; Raji et al., 2017; Workie et al., 2018; Mekonnen et al., 2018; Adeleke & Mhlaba, 2019; Agegnehu et al., 2019; Ogban et al., 2020) provided evidence of sample size calculation. The caregivers of children under-five years were the primary target respondents; hence, there were no issues with informed consent.

Most of the results of the quantitative studies did not carry out tests for statistical significance. There were, however, comparisons made between groups such as rural and urban divisions. All mixed method and qualitative studies employed validation checks to enhance the credibility of findings. Focus Group Discussions and In-depth interviews were mainly used. The study designs, data collection techniques and analyses were appropriate in achieving the objectives of the studies.

3.3 Major themes

Eight sub-themes under three broad themes emerged from the data synthesis process. The central theme of caregivers' knowledge had a sub-theme: Knowledge on causes, prevention and treatment of diarrhoea, Knowledge on Home-management and Knowledge on internationally accepted diarrhoea management practices (ORS/ZINC). The caregivers' attitudes were another central theme with sub-themes including Attitudes toward prevention and treatment and health-seeking behaviour. The last main theme was the Care practices of caregivers. The sub-themes of these major themes were Prevention practices and Management practice of diarrhoea (Poor management practices and Use of ORS/Zinc).

3.3.1 Knowledge of caregivers on diarrhoeal diseases in children under five years of age

In this review, the caregivers' knowledge of diarrhoeal disease span assessment of their knowledge on the condition, its home management, and knowledge on internationally approved diarrhoea management. Some evidence suggests that across sub-Saharan Africa, the general understanding of caregivers on diarrhoea, including its definition, signs and symptom, causes, transmission and prevention, was found to be low in some countries (Mwambete & Joseph, 2010; Wilson et al., 2012; Merga & Alemayehu, 2015; Mekonnen et al., 2018; Adeleke & Mhlaba, 2019; Thiam et al., 2019). In Tanzania, mothers' knowledge of the predisposing factors of diarrhoea was poor, with only 31% of 161 mothers aware of the risk factors (Mwambete & Joseph, 2010). In a cross-sectional study conducted in Burkina Faso, it was reported that caregivers frequently failed to recognise children's diarrhoea (Wilson et al., 2012). In a qualitative study conducted in South Africa, it was reported that participants had inadequate knowledge and lacked understanding of diarrhoea and its causes (Cenge, 2015). Low maternal knowledge on diarrhoea was also reported in Lesotho (Adeleke & Mhlaba, 2019) and Ethiopia (Mekonnen et al., 2018). In Ethiopia and Senegal, respectively, only 40% and 37.5% of mothers had high knowledge about diarrhoea (Merga & Alemayehu, 2015; Thiam et al., 2019). Alternately, several other studies reported that the majority of caregivers had good knowledge of diarrhoea disease (Lekoto, 2015; Anim-Larbi, 2017; Asiegbu et al., 2017; Raji et al., 2017; Sa'ad et al., 2018; Workie et al., 2018; Omole, Wamyil-Mshelia, Aliyu-Zubair, et al., 2019; Ogban et al., 2020). An online study in Botswana emerged that mothers had high knowledge of diarrhoea (Lekoto, 2015). In Ghana, a cross-sectional study reported that most caregivers understood the causes and prevention of diarrhoea (Anim-Larbi, 2017). In Ethiopia, 65.2% of 295 caregivers had good knowledge of

diarrhoea (Workie et al., 2018). In Nigeria, (2019) reported that 89.4% of 238 participants had a correct perception of the definition of diarrhoea. Over 60% had good knowledge of the causes, and none of the participants was oblivious of the potential complications. Several other cross-sectional studies in Nigeria reported that most caregivers had a good understanding of diarrhoeal illness (Asiegbu et al., 2017; Raji et al., 2017; Sa'ad et al., 2018; Ogban et al.

The assessment of caregivers' knowledge on the home management of diarrhoea as reported in various studies was also reviewed. In some cross-sectional studies conducted in Nigeria, it emerged that many caregivers had limited knowledge on the home management of diarrhoea (Ogunrinde et al., 2012; Okoh & Hart, 2014; Tobin et al., 2014). In a study, less than 1% of 4386 caregivers were knowledgeable about home management of diarrhoea (Ogunrinde et al., 2012). This limited knowledge was exhibited in a study where it was reported that 71% of 250 mothers were found to withdraw food during acute diarrhoea in infants. Also, 44% of mothers in the same study reported a reduction in breastfeeding frequency during acute diarrhoea (Ogunbiyi & Akinyele, 2010). Contrarily, in Ethiopia, Fufa et al. (2019) reported that most respondents in a study had good knowledge of the home management of diarrhoea. This review also scoped for caregivers' knowledge on internationally approved diarrhoea management practices (ORS/ZINC). In Nigeria, the majority of caregivers were noted to have high awareness and understanding of ORS/ZINC (Uchendu et al., 2011; Kung'u et al., 2015; Bello et al., 2017; Sa'ad et al., 2018; Omole, Wamyil-Mshelia, Nmadu, et al., 2019). Kung'u et al. (2015) reported that out of 602 caregivers interviewed, 53.1% correctly mentioned the dosage of zinc. Ugwu et al. (2019) noted that awareness of Zn therapy was higher among caregivers in urban settings than in rural areas. However, a study in Nigeria reported low awareness of the use of Zinc and ORS in treating diarrhoea (Oladipo et al., 2015). Despite the high understanding and knowledge on Zinc and ORS reported in the studies conducted in Nigeria, learning on the preparation of ORT was unsatisfactory (Uchendu et al., 2011). Kung'u et al. (2015) reported that 37.4% of 602 caregivers could state the correct preparation of ORS. In Ethiopia, most caregivers were also informed to be familiar with diarrhoea management with ORS (Mekonnen et al., 2018; Workie et al., 2018). Out of 1167 caregivers, 27.8% did not know the correct procedure for ORS preparation (Mekonnen et al., 2018).

3.3.2 Attitudes of caregivers towards diarrhoeal diseases in children under five years of age

The caregivers' attitudes in this review were gauged on their attitudes towards the prevention and treatment of diarrhoea and the health-seeking behaviour of caregivers of children with diarrhoea. Regarding attitudes towards prevention and treatment of diarrhoea, it was reported in studies conducted in Ethiopia that significant numbers of caregivers had bad attitudes towards the prevention and management of under-five diarrhoeal diseases (Mekonnen et al., 2018; Workie et al., 2018). In Botswana, 57% of 84 caregivers had poor attitudes towards preventing and treating diarrhoea (Mosweu, 2018). A similar result was reported in another cross-sectional study conducted in Lesotho (Adeleke & Mhlaba, 2019). Still, on attitudes, Asiegbu et al. (2017) said that most participants in a study had a strong belief that witchcraft causes diarrhoea. This review also looked at linking the health-seeking behaviours of caregivers of children with diarrhoea as reported in the various included studies. Results from multiple studies showed that most caregivers sought treatment for diarrhoea outside their home (Mukiira, 2012; Saha et al., 2013; Anim-Larbi, 2017; Ekpo, 2017; Workie et al., 2018). Forty-eight point four per cent (48.4%) of 1012 caregivers in the Gambia visited a health centre for treatment (Saha et al., 2013). This is similar to Ethiopia, where 60.7% of 295 mothers visited a hospital to treat diarrhoea while 3.1% went to traditional practitioners (Workie et al., 2018). meanwhile, the majority of caregivers bought medicine from chemists in Kenya (Mukiira, 2012). A similar finding was reported in a cross-sectional study in Ghana (Anim-Larbi, 2017). In Nigeria, 50.4% of 1240 caregivers received care for diarrhoea at the healthcare facility, at the local drug store (19.1%), and the traditional healers (3.5%) (Ekpo, 2017). In another study, it was reported that 30.2% of 377 caregivers took their children to a hospital/clinic while 4% gave traditional medicine (Onwukwe, 2012). A more recent study revealed that 6.1% chose to seek healthcare from traditional healers, churches 1.9%, pharmacies 16.9%, patent drug stores 18.8%, hospital, 14.3% and self-medication at home 42% (Ogban et al., 2020).

3.3.3 Care practices of caregivers regarding diarrhoeal conditions in children under five

The care practices of caregivers as another central theme of this review was split into sub-themes of prevention practices and management/treatment practices. Few cross-sectional studies reported poor preventive practices (Lekoto, 2015; Olaniyi & Oyerinde, 2016; Mosweu, 2018). On the prevention practices of caregivers, regular hand washing was noted as a preventive measure (Anim-Larbi, 2017; Mekonnen et al., 2018; Adeleke & Mhlaba, 2019; Agegnehu et al., 2019). Workie et al. (2018) reported that most caregivers in a study

washed their hands before preparing food, after preparing food, and after defecation to prevent diarrhoea (Workie et al., 2018). In Gambia, relatively few primary caregivers perceived preventive methods, such as breastfeeding, adequate nutrition, and proper disposal of human waste (Saha et al., 2013). In a qualitative study conducted in Sierra Leone, preventive strategies mentioned included the need to consume clean water, prevent children from playing with their faeces, and prevent flies from transmitting germs onto children food (McMahon et al., 2013). Similar preventive practices were reported in a study conducted in Lesotho (Adeleke & Mhlaba, 2019). Treatment or management practices of caregivers as assessed in the included studies were reviewed. Management practices were split into general management practices and the usage of ORS/Zinc for the management of diarrhoea. On general management practices, caregivers were reported to have poor home management of diarrhoea (Ogunbiyi & Akinyele, 2010; Acheampong, 2013; Okoh & Hart, 2014; Merga & Alemayehu, 2015; Fufa et al., 2019; Thiam et al., 2019). In Ghana, Acheampong (2013) reported that participants in a study practised dietary restrictions during diarrhoea episodes, low use of ORS but high usage of antibiotics and anti-diarrhoeas. Ogunbiyi & Akinyele (2010) reported that 71% of 250 caregivers in a study reported food withdrawal during acute diarrhoea in infants, and 44% reported a reduction in breastfeeding frequency. Also, in another study, 42.4% of 33 women were reported to use antidiarrheal in treatment (Asiegbu et al., 2017). Ekpo (2017) reported that the most common form of rehydration given to children with diarrhoea was a salt-sugar solution prepared at home. Raji et al. (2017) also said in Nigeria that few caregivers in a study gave traditional medication to children with diarrhoea. On the conventional medication front, medicinal plants, especially Guava, were reported as the most common traditional remedy employed by most respondents in a study conducted in Tanzania (Mwambete & Joseph, 2010). Regarding rural/urban dynamics, Fufa et al. (2019) reported in Ethiopia that poor home management practice of diarrhoea was common among rural residents compared to urban residents. In Burkina Faso, it was noted that treatment practices did not agree with international recommendations in most cases (Wilson et al., 2012).

Still, on management practices, the usage of internationally recognised ORS/Zinc on management practices and, hence, was reviewed in this study. Low use of ORS/Zinc in the management of diarrhoea was reported in multiple studies (Mukiira, 2012; Ogunrinde et al., 2012; Saha et al., 2013; Sillah et al., 2013; Oladipo et al., 2015; Digre et al., 2016; Ekpo, 2017; Omole, Wamyil-Mshelia, Nmadu, et al., 2019; Ugwu et al., 2019). In Nigeria, ORS use

was abysmally low at 8.6% of 4386 caregivers (Ogunrinde et al., 2012). 36.6% of 1240 caregivers gave ORS to manage diarrhoea (Ekpo, 2017). In another study, only 34.4% of the participant used ORS for home management (Omole, Wamyil-Mshelia, Nmadu, et al., 2019). Ugwu et al. (2019) also reported from another study in Nigeria that Zinc (Zn) therapy was higher among urban caregivers than caregivers in a rural setting. In Burkina Faso, less than half of 800 caregivers in a study used ORS to treat their child's diarrhoea (Digre et al., 2016).

3. Discussion

4.2.1 Knowledge of caregivers on diarrhoeal diseases in children under five years of age.
Knowledge of health-related matters remains a crucial component and confers confidence in individuals and makes them more likely to trust their capacity to make decisions (Henderson, 2003). This suggests that to manage a disease, caregivers' knowledge, patients and other individuals must be at a reasonable level. In this review, an almost equal number of studies reported good or inadequate caregivers' knowledge on diarrhoea disease. Different dynamics were at play in these studies. Adeleke & Mhlaba (2019) noted higher knowledge among urban participants compared to their rural counterparts. Regardless, the almost equal numbers of studies that found adequate knowledge among caregivers and those that found inadequate knowledge in this review imply that across sub-Saharan Africa, caregivers' knowledge on diarrhoeal causes, transmission and prevention may be adequate or otherwise depending on the setting and the type of knowledge assessment done. As indicated earlier, knowledge is a panacea to individual decision making and actions. Thus, the findings suggest that children with diarrhoea may not be well cared for in some settings where knowledge levels are still deficient. This indicates the need to explore whether mothers in such areas receive diarrhoea education at all.

Home management of diarrhoea typically requires oral rehydration therapy (Taghavi et al., 2015). Studies reveal the use of rice water, yoghurt, salt sugar solution, and clean water as home-based fluids used to manage the condition (Fufa et al., 2019). This review emerged that a low level of knowledge among the caregivers about home management of diarrhoea was a common finding in most studies. This low level of knowledge was reported in Nigeria (Ogunrinde et al., 2012; Okoh & Hart, 2014; Tobin et al., 2014; Kung'u et al., 2015). In North-Western Nigeria, the poor knowledge reported was more so alarming. Out of 4386 caregivers, just 1% were knowledgeable about home management of diarrhoea (Ogunrinde et al., 2012). The study was conducted mainly in a rural setting. However, a few studies in this

review reported a high level of knowledge on the home management of diarrhoea (Sillah et al., 2013; Bello et al., 2017; Fufa et al., 2019). It was noticed that the studies that reported high knowledge of home management practices were conducted in urban centres such as Jos, Nigeria (Bello et al., 2017) and Doba Woreda, Ethiopia (Fufa et al., 2019).

WHO and UNICEF recommend treating diarrhoea with low-osmolarity ORS and Zinc (Zn) tablets, which decrease the severity and duration of the attack (WHO, 2009). Studies were assessed to determine caregivers' knowledge on ORS/Zinc usage in the treatment of diarrhoea. Of 8 studies identified to have assessed caregivers' knowledge on ORS/Zinc, only 1 (Oladipo et al., 2015) reported low awareness of zinc and ORS. Studies in Nigeria (Uchendu et al., 2011; Kung'u et al., 2015; Sa'ad et al., 2018; Omole, Wamyil-Mshelia, Aliyu-Zubair, et al., 2019) and in Ethiopia (Mekonnen et al., 2018; Workie et al., 2018) reported high knowledge and awareness on ORS and Zinc therapy. Despite the high knowledge reported in these studies, it was observed that caregivers had limited knowledge in the preparation of ORS, as evidenced by results reported by Onwukwe (2012), Kung'u et al. (2015) and Mekonnen et al. (2018). This questions the content of education given by health professionals on the home management of diarrhoea using ORS/Zinc in some settings. Considering the differences in knowledge of home management and ORS/Zinc usage across settings, education on interventions for managing diarrhoea in under-five children must be tailored considering the factors that prevent mothers from having adequate knowledge.

Overall, this review acknowledges that the level of knowledge of caregivers on diarrhoea, including its causes, transmission, prevention, home management remain inadequate in sub-Saharan Africa. Knowledge levels are usually adequate in urban centres compared to rural areas. Knowledge of ORS/Zinc therapy is commendable but inadequate as correct preparation of ORS presents another problem. This calls for continuous effective health education personalised to address the knowledge gaps of caregivers on diarrhoea, especially on prevention and home management. The right preparation of ORS in Oral Rehydration Therapy must be emphasised. Caregivers in rural areas need these continuous educations than their counterparts in urban areas.

4.2.2 Attitudes of caregivers towards diarrhoeal diseases in children under five years

With the studies that assessed and graded attitudes as good or poor, most reported unsatisfactory attitudes among caregivers (Mekonnen et al., 2018; Mosweu, 2018; Workie et al., 2018; Adeleke & Mhlaba, 2019). No study in this review reported good or satisfactory

attitudes. Several studies assessed caregivers' attitudes without a nominal scale (good or poor attitudes); hence the limited cited sources in this review section. As noted earlier, knowledge on the prevention and treatment of diarrhoea remain limited in sub-Saharan Africa, especially in rural areas. Enough education on these preventions would jeer caregivers towards attitudes to avoid actions that predispose under-five children to diarrhoea. Attitude involves the human mind's predisposition to specific ideas, values, people, systems, institutions. At the same time, behaviour relates to the true expression of feelings, action or inaction orally or/and through other means (Saini, 2014). Consequently, behaviour can be said to be an extension of an attitude. Attitudes may impact the selection of appropriate healthcare centres for treatment. In this review, results showed that the majority of caregivers seek healthcare outside the home, as reported by Saha et al. (2013), Ekpo (2017) and (Ogban et al., 2020). Some of the sources of healthcare visited for treatment of diarrhoea include health centres (Saha et al., 2013; Workie et al., 2018; Ogban et al., 2020), local drug stores or pharmacies (Mukiira, 2012; Onwukwe, 2012; Ekpo, 2017; Ogban et al., 2020), traditional healers (Mukiira, 2012; Onwukwe, 2012; Ekpo, 2017; Ogban et al., 2020) and churches (Ekpo, 2017). Apart from hospitals, health centres and pharmacies, all other sources constitute inappropriate health-seeking attitudes. The unavailability of orthodox treatment options for caregivers drives them towards other inappropriate health-seeking choices. Easily accessible and fully stocked primary health centres are essential in limiting the use of problematic health-seeking centres.

Overall, attitudes of caregivers towards diarrhoea prevention and treatment was low in many studies. However, it must be noted that although the preferred choice for health-seeking was health centres, other inappropriate health-seeking options still exist.

4.2.3 Care practices of caregivers in Ghana for diarrhoeal conditions in children under five years of age.

Care practices in this review were sub-themed based on preventive practices and management practices of diarrhoea. On preventive practices against diarrhoea, several studies captured in this review mentioned various preventive practices of caregivers. The etiological agents of diarrhoea and many other diseases are micro-organisms. Simple hand washing is effective against such organisms. Hand washing practices were therefore mentioned as a regular preventive practice of caregivers in Ghana (Anim-Larbi, 2017), in Ethiopia (Mekonnen et al., 2018; Workie et al., 2018; Agegnehu et al., 2019), in Lesotho (Adeleke & Mhlaba, 2019). Hand washing practice was done before preparing food, after preparing food, and after defecation. Other preventive measures include breastfeeding, adequate nutrition, proper

disposal of waste (Saha et al., 2013), consumption of clean water to prevent children from playing with their faeces (McMahon et al., 2013), hygienic preparation of food and safe disposal of faecal and contaminated materials (Adeleke & Mhlaba, 2019). Some of these studies just mentioned the preventive practice as suggested by respondents. A few scored respondents to determine "good" or "poor" practice. Therefore, with the preventive measures mentioned, poor prevention was generally reported in Botswana (Lekoto, 2015; Mosweu, 2018) and Nigeria (Olaniyi & Oyerinde, 2016). Generally, people know the importance of maintaining personal hygiene. However, personal hygiene practices present a problem to people who are less conscious of its necessity. Caregivers must be made to understand the impact of adhering to preventive practices in the care of under-five children.

Regarding these management/treatment practices, high use of antibiotics and anti-diarrhoea was reported in Ghana (Acheampong, 2013), in Nigeria (Asiegbu et al., 2017; Raji et al., 2017). The internationally agreed treatment for diarrhoea involves Oral Rehydration Salts and Zinc Tablets (WHO, 2009). The practice of administering antibiotics and anti-diarrhoea presents a significant problem as it deviates from the international standard management of diarrhoea. Apart from these orthodox medications, some caregivers gave traditional medicines to children with diarrhoea disease (Raji et al., 2017). Medicinal plants (Guava) were mentioned as common traditional remedies employed by most caregivers in a study conducted in Tanzania (Mwambete & Joseph, 2010). All these management practices differ from the standard hence are deemed inappropriate management practices. Some non-pharmacological or medicine management practices mentioned included food withdrawal during acute diarrhoea in infants and reduced breastfeeding frequency during acute diarrhoea (Ogunbiyi & Akinyele, 2010). All these go against recommended practices. With these practices discussed, it made sense that all the studies that graded management practices reported poor management practices (Acheampong, 2013; Okoh & Hart, 2014; Merga & Alemayehu, 2015; Fufa et al., 2019; Thiam et al., 2019). As stated, WHO and UNICEF recommend treating diarrhoea with low-osmolality ORS and zinc tablets, which decrease the severity and duration of the attack (WHO, 2009). On the assessment of the studies included, it emerged that just 3 reported a high level of practice of ORT (ORS) against nine studies that reported a low level of practice. Ekpo, (2017), Onwukwe, (2012), Uchendu et al., (2011) and Bello et al., (2017) reported good level of practice. Inadequate use of ORS was reported by Ogunrinde et al. (2012), Mukiira (2012), Acheampong (2013), Sillah et al. (2013), Saha et al. (2013), Digre et al. (2016), Oladipo et al. (2015), Ugwu et al., (2019) and (Omole, Wamyil-

Mshelia, Aliyu-Zubair, et al., 2019). The use of over-the-counter antidiarrheals instead of recommended ORS/Zinc presents as a challenge in the fight against diarrhoeal diseases. Often, antidiarrheal helps cut out the diarrhoea, but lost fluids and trace elements are not replenished. Health education on the use of ORS/Zinc must be emphasised, and these drugs must be made readily available in health centres. Most women purchase such antidiarrheals from pharmacies and drugstores. These chemical sellers must be educated to include ORS/Zinc when dispensing drugs to treat diarrhoea.

Overall, care practices of caregivers for diarrhoeal conditions in children under five years of age is poor as per the studies reviewed. Prevention practices and management/treatment practices, including usage of ORS and Zinc, mainly were low.

4. Implications for nursing practice and research

Across sub-Saharan Africa, caregivers' knowledge on diarrhoeal causes, transmission and prevention may be adequate or otherwise depending on the setting and the type of knowledge assessment done. Hence, children with diarrhoea may not be well cared for in some settings where knowledge levels are still deficient. This suggests the need to explore whether mothers in such areas receive diarrhoea education at all. Caregivers were noted to have a high awareness of ORS/Zinc. However, it was observed that many studies reported that caregivers had limited knowledge of the preparation of ORS. This questions the content of education health professionals give to clients on the home management of diarrhoea using ORS/Zinc in some settings. Considering the differences in knowledge of home management and ORS/Zinc usage across settings, education on interventions for managing diarrhoea in under-five children must be tailored considering the factors that prevent mothers from having adequate knowledge. Health education on the use of ORS/Zinc must be emphasised, and these drugs must be made readily available in health centres. Most women purchase such antidiarrheals from pharmacies and drugstores, and these chemical sellers must be educated to include ORS/Zinc when dispensing drugs to treat diarrhoea.

5. Conclusion

The diarrhoea mortality burden among children under five in Sub-Saharan Africa reveals the persistent magnitude of this preventable and treatable disease in the region. In this review, studies in Sub-Saharan Africa indicate that caregivers displayed poor overall knowledge about diarrhoea. The level of caregivers' knowledge on diarrhoea, including its causes, transmission, prevention, and home-management, remains inadequate in sub-Saharan Africa.

This was truer for studies conducted in rural areas compared to urban centres. Knowledge of ORS/Zinc therapy is commendable but inadequate as correct preparation of ORS presents another problem. Attitudes of caregivers towards diarrhoea prevention and treatment were low in many studies. However, even though the preferred choice for health-seeking was health centres, other inappropriate health-seeking options still exist. In addition, care practices of caregivers for diarrhoeal conditions in children under five years of age is poor as per the studies reviewed. Prevention practices and management/treatment practices, including usage of ORS and Zinc, were primarily low. The researchers in this review recommended that continuous health education be given to address knowledge gaps of mothers relating to diarrhoea, its prevention and treatment according to international standards.

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Appendices

Tables

Table 1: Review Search Terms

PEO Tool	**Search terms**
Population	"child" OR "children" OR "infant" OR "pre-schooler" OR "under-five years" OR "under-four years" OR "under-three years" OR "under-two years" OR "less than a year." "caregiver" OR "mother" OR "father" OR "parent" OR "guardian" OR "family."
Exposure	"diarrhoea" OR "diarrhoeal disease" OR "diarrhoeal syndrome"
Outcome	"knowledge" OR "attitudes" OR "health-seeking behaviour" OR "care practices" OR "prevention practices" OR "management practices"

Table 2: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
• Primary research • Included caregivers of children ages 0-5 years. • Included only English studies • Included only studies conducted in sub-Saharan Africa • Included studies conducted and published from 2010-2020	• Irrelevant results • Phenomenon explored not relevant • Older studies than the target years for this study • Not in the English language • Not conducted in Sub-Saharan Africa

Table 3: Questions used for methodological quality evaluation of included studies

Order	**Questions**
1	Does the study clearly describe its objective?
2	Does the study clearly describe the exposure and outcomes?
3	Does the study describe the basic characteristics of participants (age)?
4	The demographic characteristics of groups were comparable or adjusted (age and geographical area?
5	The results of statistical analyses were presented explicitly (p values and confidence intervals)?

Order	Questions
6	The study provided estimates of random variability in the results of the primary outcome measures (standard deviation, standard error, confidence interval)?
7	Were the results adjusted for possible confounding variables through stratification or multivariate analyses?
8	Statistical tests used were adequate (devoid of application of parametric statistics for a population under 100)?
9	The measures used for the primary outcomes were accurate

Adapted from Down & Black (1998), Quality checklist for healthcare intervention studies

Table 4: Summary of included studies

Authors (year)	Location	Study design	Sample description	Key findings
Merga, N., & Alemayehu, T. (2015)	(Abramo and Megele 37 kebeles in Assosa district of western Ethiopia)	A community-based comparative cross-sectional study	232 randomly-selected mothers having children aged less than five years	The prevalence of diarrhoeal diseases among under-five children was 33.2%, and mothers' knowledge about diarrhoea's causes, transmission, and prevention in the study area was 37.5%. The prevalence of diarrhoeal disease was higher in the settlement area, whereas mothers' knowledge was better in the indigenous community; 62.9% of mothers were categorised as having a good attitude on causes, transmission, and prevention of diarrhoeal disease. Community water source, water storage container, and mothers' knowledge remained a strong predictor of diarrhoeal morbidity after logistic regression analysis (OR=8.4, CI 3.59-31.85; OR=2.2, CI 1.02-4.89; and OR=3.62, CI 1.23-4.71 respectively).
Raji, M. O., Abdullahi, U., Raji, I. A., Oladigbolu, R. A., Kaoje, A. U., & Awosan, K. J. (2017).	Kalambaina, located within Wammako Local Government Area of Sokoto State, Nigeria	Community-based cross-sectional study	238 study participants with children less than or equal to 5 years	Most (90%) of the caregivers had good knowledge of diarrhoea disease. More than half of them (60.5%) gave their children drugs meant to stop diarrhoea, and few of them provided a traditional medication to children with diarrhoea disease (23.3%). Caregivers' knowledge of diarrhoea disease was significantly associated with her marital status, hers and her husband's educational status, occupational status of her husband. A mother's marital status (being married) was the main predictor of a child having diarrhoea disease.
Bello, D. A., Afolaranmi, T. O., Hassan, Z. I., Ogbonna, F. C., Inedu, P. G., Ejiga, C., & Chirdan, O. O. (2017).	Jos, Plateau State, Nigeria	Cross sectional study	158 mothers of under-fives	Good knowledge of ORS was found among 94 (59.5%) of the respondent, with a corresponding 96 (60.8%) engaging in good use of ORS in managing diarrhoea disease for their under-five children. The use of ORS in the management of diarrhoea disease was significantly influenced by the level of knowledge of ORS, age of the mothers, availability of prep-packed ORS and tertiary education.

Ogunbiyi, B. O., & Akinyele, I. O. (2010)	Ibadan, Nigeria.	The single-round cross-sectional study	250 nursing mothers aged between 17 and 45 years	Only 6.0% knew nutritional management of diarrhoea, while 54.8% knew about oral rehydration therapy. 71% of respondents reported food withdrawal during acute diarrhoea in infants, 44% also reported a reduction in breastfeeding frequency during acute diarrhoea. More than two-thirds of these (71.2%) cited cultural reasons for withholding breastfeeding. Mothers' educational level did not significantly affect their knowledge of nutritional management of acute diarrhoea in infants ($p = 0.610$). Mothers' knowledge of nutritional management of acute diarrhoea had a significant effect on their attitude ($p = 0.03$) but not on their practice ($p = 0.257$).
Mwambete, K. D., & Joseph, R. (2010)	Temeke municipality, Tanzania	Cross sectional descriptive survey	161 mothers	The frequency of diarrhoeal episodes was high among the under-fives and was comparable between females and males (87 vs 74; $P<0.05$). Medicinal plants were the most common traditional remedies employed by the majority (71%) of the interviewees purported to manage childhood diarrhoea effectively. Guava (leaves and fruits) was the most commonly used remedy in the treatment of diarrhoea. Mothers' knowledge of predisposing factors of childhood diarrhoea was poor, directly correlated with education level. Only about one-third of the respondents (31%) were aware of risk factors for childhood diarrhoea that cited poor sanitation and water as the main factors.
Uchendu, U. O., Emodi, I. J., & Ikefuna, A. N. (2011).	Enugu, Nigeria	Qualitative Interviews	156 Caregivers	Access to ORT fluids was high, with 73.1% of all children with diarrhoea being offered an ORT fluid at home. However, the method of preparation and administration of fluids was quite unsatisfactory. Previous experience with ORT fluids, higher educational or socioeconomic status did not correlate significantly with better performance
Tobin, E. A., Isah, E.	Edo State, South-	Descriptive cross-sectional study	204 mothers of under-	143 (83.3%) correctly knew that ORS provided energy

C., & Asogun, D. A. (2014)	South Nigeria		five years children	during diarrhoea, 128 (80.0%) knew it replaced lost fluids. Seventy-eight (38.2%) mothers acknowledged that children should be given more fluids than usual during diarrhoea, 72 (35.3%) more breast milk than expected, and 94 (47.1%), more food than usual. One hundred and twenty (58.8%) mothers were aware that antibiotics might be used during diarrhoea. Overall, only 80 (39.2%) mothers were found to have good knowledge of home management of diarrhoea. Knowledge was significantly associated with age, marital status, educational status and social class of mothers.
Agegnehu, M. D., Bewket Zeleke, L., Goshu, Y. A., Ortibo, Y. L., & Mehretie Adinew, Y. (2019).	Enemay District, Northwest Ethiopia	Community-based cross-sectional study	398 Caregivers	This study identified that occupation (AOR: 3.922, 95% CI:1.593, 9.657), family size (AOR: 0.088, 95% CI: 0.009, 0.916), and understanding on diarrhea (AOR: 0.237, 95% CI: 0.091,0.613) were associated factors of diarrhea prevention practice of under-five children
Kebede Fufa, W., Berhe Gebremedhin, G., Gebregergs, G. B., & Marama Mokonnon, T. (2019).	Doba Woreda, Ethiopia	A community-based comparative cross-sectional study	599 caregivers	Poor home management practice was 55.8% of urban and 85.6% of rural residents. Knowledge level (AOR=2.7(CI[1.3, 6.5]) and AOR=13.4(CI[5.3, 34.0]) and difficulty in preparing oral rehydration salt (AOR=4.0CI[1.4, 11.0]) and AOR=2.4(1.3, 5.3)) were associated factors for both urban and rural residents, respectively. Caregivers of male index child (AOR=2.3(1.2, 4.7)) and age of the caregivers (AOR=0.26(0.09, 0.8)) were associated with the poor home practice for urban residents. In rural residents, inaccessibility to zinc supplementation (AOR=2.4(1.2, 5.0)) was among the associated factors.
Mukiira, C. K., & Ibisomi, L. (2012).	Nairobi, Kenya	Qualitative Interviews	11,677 Caregivers	The study shows that healthcare-seeking practices for diarrhoea remain a significant challenge among the urban poor, with more than half (55%) of the caregivers seeking inappropriate health care. A substantial proportion of caregivers (35%) are taking no action regarding the child illness. The use of ORS and Zinc supplements which have

				been widely recommended for the management of diarrhoea by UNICEF and WHO is very low. The critical predictors of healthcare-seeking identified by the study are the duration of illness, place of residence and the child's age.
Onwukwe, S. C. (2014)	Emfuleni sub-district of Sedibeng District, Gauteng Province, South Africa	Descriptive cross sectional	377 mothers/caregivers	About 53.3% of the caregivers gave ORT as an initial response to diarrhoea, 30.2% took their child to the clinic/hospital, while 4% gave orthodox or traditional medicine. The majority of the caregivers (89.4%) had heard of ORT. The primary source of ORT information was clinic/hospital (89.6%). Most caregivers (81.7%) said ORT stops diarrhoea, while 18.3% said it prevents dehydration. Many of the caregivers (66%) had used ORT. The caregivers' ORT knowledge was significantly associated with attitude and (P= 0.0000).
Mosweu, G. J. (2018).	Mogoditshane, Botswana	Cross-sectional survey	84 caregivers	The study found inadequate KAP among caregivers that was significantly associated with gender and level of education. Gender was significantly associated with the level of knowledge ($p<0.001$) and level of practice ($p= 0.04$), while the level of caregivers education was significant with the level of attitude. ($p= 0.015$). There was no statistically significant relationship found between KAP variables. Practice and knowledge (p-value close to 1), practice and attitude ($p=0.70$), attitude and knowledge ($p=0.66$).
Ogban, G. I., Ndueso, E. M., Iwuafor, A. A., Emanghe, U. E., Ushie, S. N., & Ejemot-Nwadiaro, R. I. (2020).	Calaba, Nigeria	Descriptive cross sectional study	660 caregivers	638 (98.2%) of respondents had a good basic knowledge of childhood diarrhoea in under-five children, 12 (1.8%) had fair basic knowledge, no group was rated as having poor basic understanding. The occurrence of childhood diarrhoea was marginally higher among respondents with good knowledge of diarrhoea (50.3%) than respondents with fair basic knowledge (50%). In practice during the advent of

				childhood diarrhoea, some caregivers chose to seek healthcare from traditional healers 6.1% (19), churches 1.9% (6), pharmacies 16.9% (53), patent drug stores 18.8% (59), hospital, 14.3% (45), or self-medication at home 42% (132).
Acheampong, C. A. (2013).	Accra, Ghana	Cross-sectional study	120 caregivers	The study shows poor home management of diarrhoea, including dietary restrictions during the diarrhoea episode, low use of both RHFs and ORS but high use of other remedies such as antibiotics and anti-diarrhoea to treat diarrhoea. The study also reveals that caregivers' educational level had no relationship with knowledge about danger signs of diarrhoea, correct use of ORS, and level of awareness and service of RHFs and ORS. However, convincing evidence of a relationship was established between caregivers' education and knowledge about causes of diarrhoea and health insurance cover and duration of diarrhoea illness before the hospital visit.
Cenge, Z. P. (2015).	Eastern Cape, South Africa	Qualitative Interviews	7parents/caregivers	The findings revealed that the participants had inadequate knowledge and lacked understanding of diarrhoea and its causes. Participants could not mention all the causes and risk factors associated with diarrhoea. Noteworthy is that the participants' perceived diarrhoea as a severe condition.
Adeleke, A. I., & Mhlaba, T. (2019).	Maseru, Lesotho	Cross-sectional study	458 mothers/caregivers	Aggregation of participants' knowledge, attitudes, and practices response reveal a statistically significant association with a residence. The maternal age range of 30-39 years, P = .03, and mothers with three (3) children, P = .02 were significantly associated with the knowledge of prevention and management of diarrhoea in the rural area. In the urban area, mothers with tertiary education, P = .04, employed, P = .001, unemployed, P = .004, and all categories of monthly income were significantly associated with the knowledge of prevention and management of

				diarrhoea. An association between mothers' attitudes and monthly income between M500 – M1399, P = .05 was observed for the urban setting.
Okoh, B. A., & Alex–Hart, B. A. (2014).	Southern Nigeria	Descriptive cross sectional study	157 caregivers	Of the 157 caregivers, 29.3% had a good level of knowledge, while 33.8% had a good level of practice of the home management of diarrhoea. A higher knowledge score was significantly associated with the Social class (P=.002) and mother's educational level (P=.002). A higher practice score was also significantly associated with the Social class (P<.001) and mother's educational level (P<.001). After adjusting for other factors, the mother's educational level was significantly associated with both groups of knowledge (P=0.022) and practice (P=0.012) of the home management of diarrhoea.
Oladipo, A. R., Falana, A., Adegoke, O., Sambo, A., & Kung'U, J. (2015).	Northern, Nigeria	Qualitative and quantitative methods		We found that awareness of the use of zinc and lo-ORS in treating diarrhoea is low among caregivers across surveyed states; awareness in Jigawa (44.5%) and Katsina (14.9%) states were higher than in Benue state (2.7%) while it was lower in Yobe (0.3%) and Zamfara states (0%). The percentage of caregivers of under-5 children with diarrhoea using the recommended dose of Zinc and Lo-ORS at home was also low (2.1% for Jigawa, while Katsina, Yobe and Zamfara recorded 0%). In contradiction, the percentage of caregivers who seek treatment for diarrhoea ranges from 66.7% in Jigawa to 97.2 in Zamfara. Barriers to utilisation of zinc and lo-ORS were similar across the surveyed states. They included non-availability, lack of adequate knowledge of the benefits and efficacy of zinc and lo-ORS and preference for herbal (traditional) medicine.
Ogunrinde, O. G., Raji, T., Owolabi, O.	Northwestern(Kastina, Kebbi and Zamfara)	Cross-sectional study	4386 caregivers	Less than 1% of caregivers was knowledgeable about home management of a diarrhoeal disease. Antibiotics and

A., & Anigo, K. M. (2012).	Nigeria.			antidiarrheal agents were common at 36%, and ORS use was abysmally low at 8.6%. Only 32% of caregivers were aware of the use of zinc in the management of a diarrhoeal disease. Adherence to 10-day zinc supplementation was encouraging at 75.5%.
Ugwu, J., Ezeagu, I., & Ibegbu, M. (2019).	Enugu State, Nigeria	Qualitative Interviews	386 caregivers	Of the 386 caregivers, 123 (62%) indicated awareness of Zn salt, and of these, only 39 (10%) practised Zn salt treatment. The level of education seems to influence awareness and practice positively in the urban setting. Economic status underscored by employment type, clinic visits, and health campaigns positively influenced the adoption of ORS +Zn therapy in rural and urban communities. The highest level of education showed a positive association with awareness and practice of ORS +Zn treatment in both study areas. One hundred and ninety-nine caregivers (52%) of all the respondents still preferred and treated child diarrhoea with ORS with antibiotics adjuvant.
Thiam, S., Sy, I., Schindler, C., Niang-Diène, A., Faye, O., Utzinger, J., & Cissé, G. (2019)	Senegal	Cross-sectional survey	367 mothers and caregivers	Slightly less than a quarter (23.2%, 95% confidence interval (CI) 18.9–27.8%) of respondents had good management practice of diarrhoea, while 40.0% (95% CI: 34.5–45.6%) had a high level of knowledge about diarrhoea. Mothers and caregivers having sought care from public health facilities had two and four times higher odds of good knowledge and good management practices of diarrhoea, respectively, than those seeking no care outside the home or from traditional healers.
Kung'u, J. K., Owolabi, O., Essien, G., Aminu, F. T., Ngnie-Teta, I., & Neufeld, L. M.	Nigeria	Qualitative Interviews	602 caregivers/48 health workers	Nearly all health workers (98%) correctly mentioned the dosage of zinc, while only 58% correctly stated ORS preparation. The proportion of caregivers with knowledge on the treatment for diarrhoea increased from 46.4% in November 2010 pre-MNCHW to 71.3% in May 2011 pre-

(2015).				MNCHW interviews (p<0.001). More caregivers correctly mentioned the dosage of zinc (80.9%). They stated ORS preparation (88.8%) in the November 2010 exit interview immediately after the MNCHW encounter compared to the levels in the home follow-up visit (53.1% and 37.4%, respectively). After attending both rounds of November 2010 and May 2011 MNCHW, caregivers' knowledge on the treatment of diarrhoea increased seven times compared to the caregivers who participated at the May 2011 MNCHW only (OR=7.0, p<0.001).
Merga, N., & Alemayehu, T. (2015).	Western Ethiopia	Quantitative data	232 mothers	The prevalence of diarrhoeal diseases among under-five children was 33.2%, and mothers' knowledge about diarrhoea's causes, transmission, and prevention in the study area was 37.5%. The prevalence of diarrhoeal disease was higher in the settlement area, whereas mothers' knowledge was better in the indigenous community; 62.9% of mothers were categorised as having a good attitude on causes, transmission, and prevention of diarrhoeal disease. Community water source, water storage container, and mothers' knowledge remained a strong predictor of diarrhoeal morbidity after logistic regression analysis (OR=8.4, CI 3.59-31.85; OR=2.2, CI 1.02-4.89; and OR=3.62, CI 1.23-4.71 respectively).
Digre, P., Simpson, E., Cali, S., Lartey, B., Moodley, M., & Diop, N. (2016)	Burkina Faso	Quantitative and qualitative	400 caregivers	Although more than 80% of caregivers were aware of ORS, less than half reported using it to treat their child's diarrhoea. Replacing fluids lost due to diarrhoea was considered a low priority by most caregivers, and many said antibiotics were more effective for treating diarrhoea. Users and non–users of ORS held substantially different perceptions of the product, though all caregivers tended to follow recommendations of health care workers. A significant proportion of users reported difficulty in getting

				a child to drink ORS
Anim-Larbi, M. A. T. I. L. D. A. (2017)	Accra, Ghana	Descriptive cross-sectional survey	251mothers	A binary logistic regression analysis revealed that the gender of children, mothers' knowledge about Oral Rehydration Salt (ORS) and their awareness about Zinc tablets predict their diarrhoeal management practices. In addition, mothers who believed that children could die from diarrhoea and those who thought children were susceptible to diarrhoea were found to have good management practices.
McMahon, S. A., George, A. S., Yumkella, F., & Diaz, T. (2013).	Sierra Leone	Qualitative Interviews	104 parents/caregivers	Respondents reported multiple, co-existing descriptions of causation, including contaminated water and difficulties accessing clean water; exposure to an unclean environment and poor food hygiene; tainted breast milk due to sexual intercourse, overheated breast milk or maternal bodily conditions as menstruation or pregnancy; and dietary imbalances and curses. Respondents rarely discussed the role of open defecation or the importance of handwashing with soap in preventing diarrhoea.
Sa'ad, Z. S. I., Hoque, K. E., & Arkilla, B. M. (2018).	Nigeria	Cross sectional study	109 women	The study reveals that most of the 109 women interviewed had high knowledge of Diarrhea and ORS (Mean: General Knowledge – 1.08, In-depth Knowledge – 1.47). The bivariate analysis indicates a significant moderate positive association between knowledge of Diarrhea/ORS and home preventive practices ($r = .590$, ($p= 0.00$) further supported by the results of the linear regression indicates that knowledge accounts for a significant predictor of women's Diarrhea/ORS home practices $R 2 =.342$ $F=57.106$, ($p < .05$).
Wilson, S. E., Ouédraogo, C. T., Prince, L., Ouédraogo, A., Hess,	Burkina Faso	Cross-Sectional Survey	10,490 caregivers	Clinically defined diarrhoea was present in 7.6% (95% CI: 7.1–8.1%) of children during the 24 hours preceding the survey but recognised by only 55% of caregivers. Over half (55%) of the caregivers of 1,067 children with a clinically

S. Y., Rouamba, N., ... & Brown, K. H. (2012).				defined diarrhoea episode in the past 14 days sought care outside the home; 78% of those seeking care attended a public sector clinic. Care was sought, and treatment was provided more frequently for children with fever, vomiting, anorexia, longer illness duration, and those living closer to the health centre. Care was sought more regularly for male children. 80% of children with recent diarrhoea received some form of treatment; only 24% received ORS, whereas 14% received antibiotics. Zinc was not yet available in the study area.
Workie, H. M., Sharifabdilahi, A. S., & Addis, E. M. (2018).	Ethiopia	Cross-sectional study	295 Mothers	From a total of 295 mothers, around two-thirds (65.2%) of them had good knowledge. Still, more than half of mothers (54.9%) had a negative attitude towards home-based management and prevention of diarrhoea among under-five children. Regarding the attitude of the mothers, 58% had poor practice towards home-based management and prevention of diarrhoea among under-five children.
Mekonnen, G. K., Mengistie, B., Sahilu, G., Mulat, W., & Kloos, H. (2018).	Gambella Region, Ethiopia	Cross-sectional study	1667 caregivers	The study indicates that 633 (28.0%) caregivers had poor knowledge, while 393 (23.6%) had unfavourable attitudes towards childhood diarrhoea. Knowledge of the caregivers was significantly associated with formal education (AOR, 1.3; 95% CI, 1.03–1.5) and health information obtained from a health care institution (AOR, 1.8; 95% CI, 1.28–2.3). Caregivers' knowledge is a single predictor of their attitude ($p<0.001$), and Pearson's correlation coefficient revealed that there was a significant positive correlation ($r=0.2$, $p<0.001$) between knowledge and attitude scores.
Omole, V. N., Wamyil-Mshelia, T. M., Aliyu-Zubair, R., Audu, O., Gobir, A. A., & Nwankwo, B.	North-western Nigeria	Cross-sectional descriptive study	350 mothers	About 89.4% of the respondents had a correct perception of the definition of diarrhoea. Over 60% of them had the right knowledge of the cause (s) of diarrheal disease, and none was ignorant of the potential complications. Both point and period prevalence's of the illness were 13.14% and 30.29%,

(2019)				respectively, and these were relatively higher than local, regional, and national values.
Asiegbu, U. V., Asiegbu, O. G., Ezeonu, C. T., & Ezeanosike, O. B (2017)	Ebonyi State, Nigeria	Cross-sectional study	33 women	Majority (81.8%) had good knowledge about diarrhoea illness. These were seen mainly among mothers who reside in urban areas and have higher levels of education. Majority, 69.70%, strong belief that witchcraft cause diarrhoea; these were primarily from the rural areas with low or no formal education. 42.4% of these women use antidiarrheal in treatment.
Saha, D., Akinsola, A., Sharples, K., Adeyemi, M. O., Antonio, M., Imran, S., ... & Hill, P. C. (2013).	The Gambia			Point prevalence of diarrhoea was 7.7% (95% confidence interval [CI] = 6.1–9.8); 23.3% had diarrhoea within the previous two weeks. Caregivers of 81.5% of children with diarrhoea sought healthcare outside their home, but only 48.4% of them visited a health centre. Only 17.0% (95% CI = 12.1–23.2) of children with diarrhoea received oral rehydration solution (ORS) at home. Abbreviated surveys conducted on six occasions over the subsequent two years showed no change in prevalence or treatment-seeking behaviour. Diarrhoea remains a significant problem in rural young Gambian children
Olaniyi, A. A. O., & Oyerinde, O. (2016).	Oyo State, Nigeria	Descriptive non-experimental research design	160 nursing mothers	The study findings revealed that the majority (89.4%) of respondents have heard of diarrhoea before; many of them (45%) had it from health centres and (10.6%) from the experience of diarrhoea occurrence. A majority (78.1%) of respondents knew diarrhoea, having been able to define what diarrhoea is in their perspective and identify some causes of diarrhoea. Over half (63.8%) of them claimed their index child had diarrhoea, out of which less than half (38.8%) of them managed it with ORS. Less than half of them (34.4%) managed the occurrence at home, while (25.5%) took their children to a health centre. Mothers knew diarrhoea, but knowledge translation to prevention action

				was very poor.
Lekoto, T. D. (2015).	Lobatse, Botswana	Cross-sectional survey	80 mothers	A total of 80 respondents answered the questionnaire. The findings revealed that mothers have high knowledge of diarrhoea but poor practices on the prevention of diarrhoea. Thus, there is a wide gap in mothers' knowledge and practices regarding the prevention of diarrhoea. From this, interventions are needed to enhance the mothers' practices to promote the prevention of diarrhoea.

Figures

PRISMA DIAGRAM: SEARCH, EVALUATION AND INCLUSION

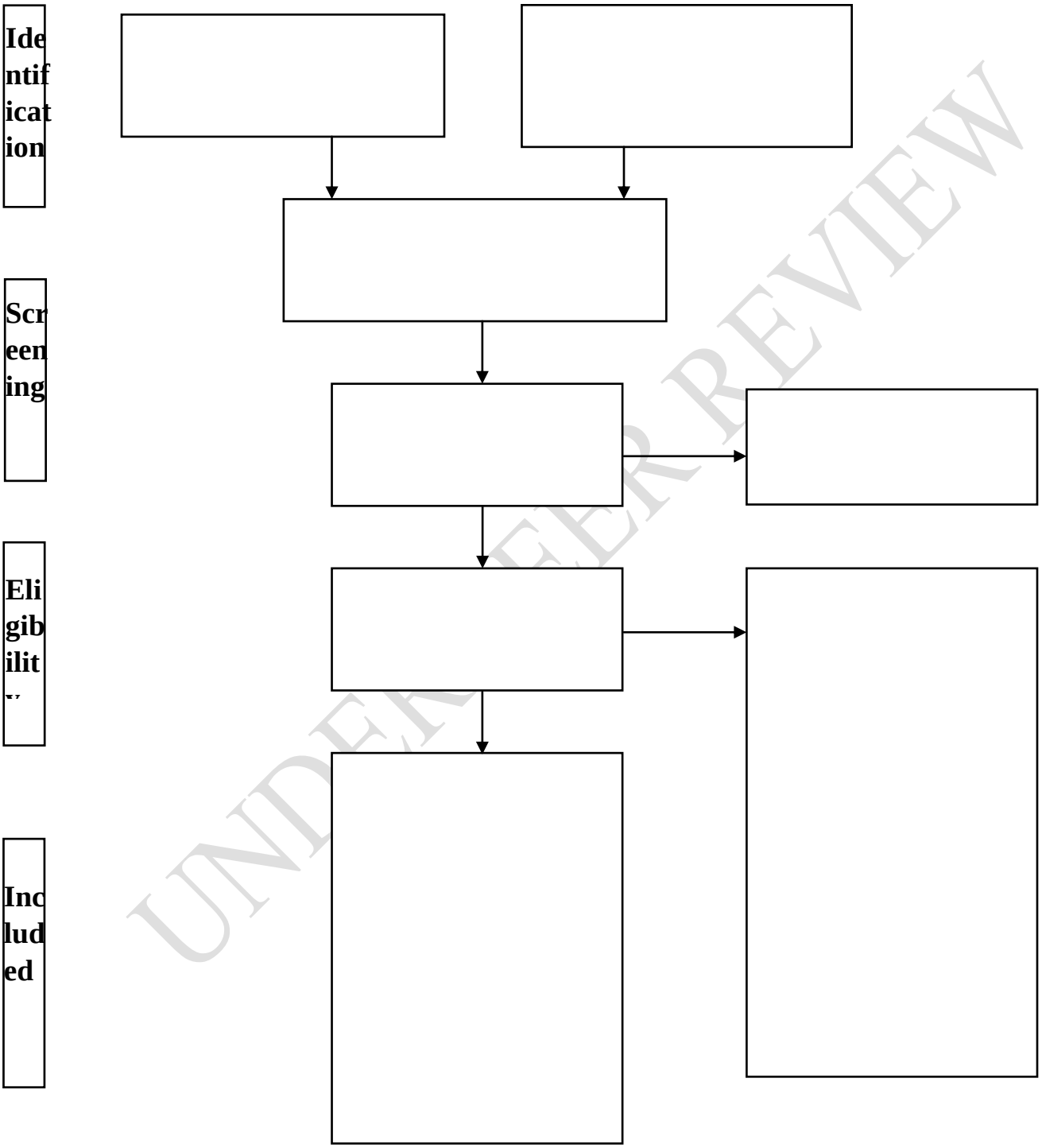

Figure 1: PRISMA Diagram: The search and inclusion process