Evidence on access to health care information by women of reproductive age in Low-and-Middle-Income Countries: Scoping Review

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Abstract

Background Majority of women of reproductive age in Low and Middle Income Countries (LMICs) are not able to access health services due to different factors. The main objective of this scoping review is to map the literature on access to healthcare information by women of reproductive age in LMICs.

Methods The literature search was conducted through the following databases: Scholar, Science Direct, PubMed, EBSCOhost (Academic search complete, CINAHL with full text, MEDLINE with full text, MEDLINE, and PsycINFO), Emerald, Embase, published and peer reviewed journals, organizational projects, reference list, grey literature as well as reports related to this objective were included in the study. Studies reporting evidence on interventions aimed at enabling access to health care information in LMICs published during the period 2004 to until recent, were eligible for inclusion. Identified key words were used to search articles from the databases. Following title screening, two reviewers independently reviewed the abstracts and full articles. Inclusion and exclusion criteria was considered to guide the screening.

Results A total of 451,900 articles were identified from all the databases searched. Of these, four articles meet inclusion criteria after full article screening and were included for data extraction. The included articles were conducted in the following countries: Eastern Uganda, Gauteng, South Africa, Myanmar and Nepal. The themes that emerged from our study are as follows: accessibility, financial accessibility/affordability, connectivity and challenges. This study demonstrated that, there are minimal interventions that enable women of reproductive age to access healthcare information in terms of accessibility, financial accessibility and connectivity. The study further revealed that with the minimal strategies tried, such as telemedicine and text messages, a large population of women could be reached and this strategies are less cost.

Conclusion The findings of the study revealed poor access and utilization of maternal healthcare information by women of reproductive age. We therefore recommend primary studies in other LMICs to determine the accessibility, financial accessibility, connectivity and challenges faced by women of reproductive age in LMICs to reduce maternal and neonatal mortality rate and to achieve the Sustainable Development Goal 3.

Background

There are more than a billion people around the globe, mainly in low-and-middle–income countries (LMICs) who are unable to access essential health care services due to a variety of reasons [1]. Roughly, about 150,000 women in Africa die year in year out from causes related to pregnancy and childbearing and that the risk of dying from maternal related causes for African women is in the range of one in twenty-five [2]. Barriers to access and utilise health services have been classified into access, availability, acceptability, and cultural and traditional preferences, confidence in care and quality of services, health awareness and knowledge, and affordability [3]. Access is part of Universal Health Coverage (UHC) components (access, effective coverage and need) [4]. UHC, according to the World Health Assembly is defined as “All people receiving comprehensive quality health services they need without enduring financial costs in so doing thereby achieving equity in access” [4]. Access has four dimensions, namely: geographic accessibility; availability; financial accessibility; and acceptability [5]. Women of reproductive age will utilize maternal healthcare information to their maximum if they have access to healthcare services. Possible factors influencing utilization of health care services either public or private, are socio-economic factors, cultural beliefs and practices. In particular, the health care system itself, the distance from the health facilities, availability, affordability and quality of health-care are among the prevalent factors that influence health-care utilization [1]. Improved accessibility to health care services has been and continues to be a central objective of health policy for
optimum health system performance [6, 7]. Substantial research has been conducted focusing mainly on access to health care information and sustained attention was given mostly to accessibility issues in health policies and in the context of health services research, however community and policy makers continue to seek answers to this fundamental question [7]. A key element of UHC is that of ensuring access to and use of needed health services for everyone. This can only be achieved if accessing health care information by women of reproductive age are identified and utilized [8]. The main aim of this study is to map evidence on access to healthcare information by women of reproductive age in LMICs. Evidence on the topic area will be needed to guide the study on the available scientific knowledge that was collected and how far it was utilized. This will provide an opportunity to guide the primary study to see whether there is previous knowledge on the topic area as well as how far it was researched and also to determine or prove the necessity of conducting the main study.

**Aims/objectives**

The main objective of this scoping review was to map the evidence on access to healthcare information by women of reproductive age in LMICs.

**Methods**

**Methods**

A scoping review was selected in this study as the most appropriate method to map literature on evidence on access to health care information by women of reproductive age in Low-and-Middle-Income Countries. The scoping review, was guided by Tricco et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR) which follows the following methodology: Title; abstract; introduction (rationale and objectives); methods (protocol and registration, eligibility criteria, information sources, information sources, search, selection of sources of evidence, data charting process, data items, critical appraisal of individual sources of evidence and synthesis of results); results (selection of sources of evidence, characteristics of sources of evidence, critical appraisal within sources of evidence, results of individual sources of evidence, synthesis of results); discussion (summary of evidence); limitations; conclusion and funding. The results of the review were presented according to PRISMA Extension for Scoping Reviews (PRISMA – ScR) [9].

**Identify the research question**

**Main research question:** What is the evidence on access to health care information by women of reproductive age in LMICs?

Sub-questions: What challenges or barriers contribute to women of reproductive age in LMICs not to access health care information?

The PCC (Population-Concept-Context) framework for determining the eligibility of the studies for the primary research question was adopted (Table 1).
Eligibility Criteria

The study was guided by inclusion and exclusion criteria to develop the research questions, this is to ensure the correct identification and selection of relevant studies.

Studies were selected according to the “population-concept-context (PCC)” framework recommended by the Joanna Briggs Institute for scoping reviews as stipulated under table 1 [10, 11].

The Lower and Middle Income Countries under the context were determined by the World Bank list of economies [12] which has classified the countries according to their economic status. The study will focus on the period as from 2004 until recent, focusing on 15 years period will enable the researchers to collect broader knowledge from studies generated during the specified period. The study included articles written in all languages and used the University of Kwazulu - Natal Systematic Review Services to help with searching for interpreters in case there were studies retrieved that were published in other languages. According to WHO, women of reproductive ages range from 14-49 years old [13].

Table 1: PCC Framework

| Criteria | Determinants |
|----------|--------------|
| population | Women of reproductive age in LMICs |
| C Concept | Any interventions that enable women of reproductive age access to health care information carried out during 2004 to recent. |
| C Context | Research articles will be limited to Lower and Middle Income countries. |
| C Context | No restriction on language |
| C Context | Evidence from the period 2004 - until recent |

Information sources

A team with content and methodological expertise was assembled to ensure successful completion of the study. The data was retrieved from the following databases: Scholar, Science Direct, PubMed, EBSCOhost (Academic search complete, CINAHL with full text, MEDLINE with full text, MEDLINE, and PsycINFO), Emerald, Embase, and Cochrane Data base of Systematic Review (CDSR). Reference lists for included studies and conferences websites were search for relevant studies. The following key words were applied to search for eligible studies: Interventions, Access, Health care information, Health care services, Low and Middle Income Countries.

Selection of sources of evidence
Study selection occurred in three stages. The first stage was conducted by one reviewer through title screening databases guided by the eligibility criteria. After the title screening was completed, the process continued with abstract and full article screening. These two processes were conducted by two independent reviewers by following the inclusion and exclusion criteria. A screening form was developed guided by the questions derived from the eligibility criteria. The form was used to guide the abstract and full articles screening. During the abstract screening stage, differences in reviewers’ responses were resolved through a discussion by the review team until consensus was reached. Discrepancies at full text screening stage were resolved by involving a third screener.

**Inclusion criteria:**

Included studies met the following criteria:

- Women of reproductive age (14-49 years old).
- Evidence from the period 2004 until recent.
- Study contacted in Lower and Middle Income countries.
- Studies that focus on interventions enabling accessing to healthcare information.
- Articles including: peer-reviewed journal articles and grey literature and primary studies.
- All studies will be included irrespective of their study designs.

**Exclusion criteria:**

Excluded publications did not meet the following criteria:

- Women below 14 years old and above 49 years old.
- Studies that do not focus on health care information.
- Studies done earlier then 2004.
- Studies reporting on non-health information.
- Systematic, scoping, expert and literature reviews.

**Data charting process**

The review team collectively developed the data charting form and determined suitable variables to be extracted to help answer the study research questions. The data exaction form was piloted by two independent reviewers (JS & TPMP). The form was then adjusted accordingly. We then extracted data from included studies on the following domains: Author and date, title of the study, study aim, study design, study setting (country), geographic setting (rural/urban), study population, age, and percentage of female, interventions implemented/utilized, intervention type, duration of the intervention, key findings, significant findings, and conclusion of the study.

**Critical appraisal of individual sources of evidence**

Risk of bias was assessed in the included studies guided by the Mixed Method Appraisal Tool (MMAT) version 2018. For each included study, an appropriate category of studies was used for appraisal, by looking at the description of the methods used in the included studies. All the categories included (qualitative, quantitative and mixed method) had five criteria. The responses were either “yes” or “no” or can’t tell. A detailed presentation of the ratings of each criterion to inform the quality of the included studies was presented. The studies were assessed
based on their method. The included studies used the following methods: Qualitative, quantitative and mixed methods. For qualitative studies, the following areas were assessed: appropriateness of the research question and problem, adequacy of the data collection method and form of data, data analysis used, sufficient interpretation of the results, coherence between qualitative data sources, collection, analysis and interpretation. For quantitative studies, the following areas were assessed: relevance of sampling strategy, match between respondents and the target population, appropriateness of measurements, risk of none response, appropriateness of statistical analysis to answer research questions. For mixed method studies, the following areas were assessed: reason for conducting a mixed method, information on the integration of qualitative and quantitative phases and results, results brought together into overall interpretation, adequately addressing of divergences and inconsistencies between quantitative and qualitative results adequately addressed and adherence to the quality criteria of each tradition of methods involved.

**Synthesis of results**

First we presented the characteristics of the included studies on the following domains: The number of studies reported on the specific outcome, country where the study was conducted, participants in the study, the aim of the study, the outcomes and the research or practice gaps revealed for that particular outcome. A table was produced with the following domain: author and date, title of the study, study design, study settings, geographic setting, study population, age and % of female.

Secondly, the literature was organised thematically, based on the grounded themes extracted from the studies. The themes were as follows: Accessibility, financial accessibility, connectivity and challenges. Each theme was discussed separately. The results were presented using PRISMA Extension for Scoping Reviews (PRISMA – ScR).

**Results**

**Selection of sources of evidence**

As shown in Figure 1, a total of 451 958 articles were identified after database search. Following title screening, 65 duplicates were removed, which resulted in 201 included in abstract screening. Subsequently 408 studies were excluded and 201 abstracts screened. Of these, 52 were selected for full articles screening. A total of 48 articles were excluded following full article screening and four met inclusion criteria and were included for data extraction. See figure 1.

A total of 48 articles were excluded after full article screening. Reasons for their exclusion were as follow: 14 studies did not focus on health care information [14-27]. One study did not focus on the age of between 14-49 years old [28]. Six studies presented evidence on general healthcare [7, 29-33]. Eight studies reported on sexual and reproductive healthcare services [34-41]. Fifteen studies reported on maternal healthcare services [42-57]. Three studies were literature reviews [3, 31, 58].

Following full article screening there was 80.77% agreement versus 68.64% expected by chance which constitutes a good agreement between screeners (Kappa statistic = 0.39 and p-value<0.05). In addition, the McNemar's chi-square statistic suggests that there is not a statistically significant difference in the proportions of yes/no answers by reviewer with p-value >0.05. Discrepancies between reviewers’ responses following full article screening were resolved by involving a third reviewer.
Characteristics of sources of evidence

Table 1 depicts characteristics of the included studies. All the eligible studies were published between the year 2004 until recent. The study setting for all the included studies was in LMICs. All of the included primary studies showed evidence on access to health care information by women of reproductive age in LMICs. Two of the four included studies were conducted in rural settings [59, 60] and, the other two were conducted in both rural and urban settings [61, 62]. The included studies were conducted in the following countries: one in Myanmar [61], one in South Africa [62], one in Eastern Uganda [60] and one in Nepal [59]. The total sample size from included studies was 11 134 participants and all were women. All studies were focusing on female participants [59-62]. The study design of the five studies included, two were quantitative studies [60, 61], one was mixed methods [59] and one was qualitative studies [62]. One of the four included studies reported on universal health coverage [61], another study reported on value for money of mobile maternal health information messages [62], two reported on increasing access to maternal health care services and exploring the role of telemedicine, respectively [59, 60].

Table 2: Results of individual sources of evidence

| AUTHOR AND DATE | Title of the study                                                                 | Study design                        | Study setting (Country) | Geographic setting (rural/urban) | Study population | Age | % of female |
|-----------------|------------------------------------------------------------------------------------|------------------------------------|-------------------------|---------------------------------|------------------|-----|-------------|
| Han, 2018       | Progress towards universal health coverage in Myanmar:                             | Quantitative stratified multistage design | Myanmar                 | Both                            | DHS data and Integrated household living condition assessment. | Not indicated | Not indicated |
| LeFevre, 2018   | Forecasting the Value for Money of Mobile Maternal Health                          | Qualitative- Retrospective Case Control Study | Gauteng, South Africa   | Both                            | pregnant women   | 14-49 | 100         |
| Mayora, 2014    | Incremental cost of increasing access to maternal                                  | Quasi-experimental voucher study.   | Eastern Uganda          | Rural                           | 2 Districts (3 Health sub district each) | 14-49 | 100         |
| Parajuli, 2017  | Exploring the role of telemedicine in improving access to healthcare services by women and girls in rural Nepal | mixed method                        | Nepal                   | rural                           | girls and women  | 17-37 | 100         |
Critical appraisal within sources of evidence

All included studies underwent methodological quality assessment (additional file) using the mixed methods appraisal tool (MMAT) version 2018 [63]. The overall percentage quality score was calculated for included studies. The scores ranged from 71.4% to 100%. They were interpreted as follow: below 51% low quality, 51-75% average quality and 76-100% high quality.

Synthesis of results

The themes that have emerged from the four included studies are as follows: Accessibility, financial accessibility, connectivity and challenges. All four studies show evidence on access to health care information by women of reproductive age in LMICs.

Accessibility

Out of the four included studies, one study reported on accessibility of maternal healthcare to pregnant women. Study conducted in Myanmar reported on universal health coverage. The main purpose of this study was to determine the national and subnational health service coverage and financial risk protection [61]. 26 health service indicators was examined by using nationally representative data from the Myanmar Demographic and Health Survey (2016) and the Integrated Household Living condition Assessment (2010). The same study also assessed the incidence of catastrophic health payment and impoverished caused by out-of-pocket payments [61]. The study findings shows that nationally, the coverage of health service indicators ranged from 18.4% to 96.2%. The findings further indicated that the coverage of most health services indicators did not reach the universal health coverage of 80% [61]. The study further found that increased levels of education (either their mothers or partners) have a positive influence on the access to perinatal care services [61]. Further, the study shows that women with some higher education were likely to attend at least four antenatal care visits and to deliver in the health facilities as compared to those with no education [61]. The similar study recommends that in order to achieve 80% coverage, efforts should focus on the expansion of services and increase coverage in order to reduce the gap that exists in maternal, neonatal and child health coverage [61]. Although the study mentioned about the gap in maternal, neonatal and health coverage, a research gap still exists to explore interventions that can be used to attract women of reproductive age to use maternal healthcare services.

Financial accessibility/Affordability

One study reported on affordability of maternal healthcare services to women of reproductive age. Mayora, et al., (2014) conducted a study in Eastern Uganda to assess the influence of demand and supply-side programmes on increasing access to maternal health services [60]. This was a costing study that used vouchers. Costs were based on market prices as recorded in program records [60]. During this study, pregnant mothers were issued vouchers that they needed to present to the service provider who in return will be reimbursed by the research team on presenting the voucher (Dec 2009 – March 2010 and June 2010 to June 2011) [60]. The outcome of this study revealed that transport vouchers scooped the highest followed by health system strengthening, while maternal services vouchers came the lowest [60]. The study further shows that the average cost of transport per women to and from the health facility was US$4.6. It further indicates that delivery cost was the highest with US$ 317,157 followed by antenal care US$ 107 890 while post-natal care was the least with US$ 7.6 [60]. The findings also revealed that subsidizing maternal health care costs through demand and supply – side initiatives is less cost and will only require less resources than expected [60]. Although the study indicated that voucher study can be used and may not require
significant amount of resources, an extensive research still needs to be conducted on its sustainability and what would be the reasonable cost to the entire population.

**Connectivity**

Two studies reported evidence on connectivity of women to maternal healthcare services [59, 62]. A study conducted in Nepal reported on telemedicine in improving access to healthcare services by women and girls in rural Nepal [59]. The sample for this study were women and girls who used video conference-based telemedicine services before January 2015 and those who received mobile phone-based telemedicine in January of the same year [59]. The purpose of the study was to assess the influence of telemedicine in reducing gender-based challenges that women and girls are facing to reach health care services in rural areas of Nepal [59]. The results of the study revealed that telemedicine influence travel restrictions, treatment expenses and apprehension regarding sexual and reproductive health consultation positively. The study further shows that, this intervention decreased travel time, because women and girls will be assisted to access health care services timely. At the same time it create convenience in terms of improved time management because the women will be still be at home to perform her household chores and other activities [59]. This study revealed that telemedicine, especially mobile phone-based telemedicine, made it possible to encouraged women and girls to have confidence and freedom to ask about sexual health-related information from a doctor who is located at a far distance [59]. The study further revealed that women and girls’ fear or timidity has been reduced because their identity is not being revealed because of the insurance of mobile phone-based telemedicine [59]. A study conducted in Gauteng, South Africa aimed at modelling the incremental cost-effectiveness of gradually scaling up text messaging services to pregnant women showed this as a cost-effective strategy for bolstering antenatal care and childhood immunizations [62]. The two studies indicated modalities of accessing services women of reproductive age from a distance, however there is still a research gap on how to access the population of women of reproductive age who are not within the diameter of network coverage and those who cannot afford to acquire technology devices such as cell phones.

**Challenges**

Two studies presented evidence on challenges or barriers to access maternal health care services by women of reproductive age [59, 61]. Study findings by Han et al., 2018, highlighted certain hindrances to effective implementation of maternal healthcare programmes which include heavy workloads, geographical and transportation barriers, poor supervision, training and insufficient replacement of auxiliary midwife kits [61]. The lack of accessible healthcare facilities, inadequate health workforce and health budget allocation were the main causes of the regional inequity [61]. The main barriers in most Asia-Pacific countries, including Myanmar, are high use fees and cash payment for health care services, which are highly likely to hinder disadvantaged communities from accessing healthcare facilities [61]. Maternal, neonatal and child health indicators such as post-natal care for neonates and institutional delivery recorded the lowest coverage [61]. In addition, financial constraints and lack of transportation are the prevalent hindrances to accessing delivery care facilities [61].

Study by Parajuli and Doney, (2017) reported that even though telemedicine is inclined to reduce gender-based barriers for women and girls, we should take note that their capacity to benefit from telemedicine is limited mainly in two ways. Firstly, women and girls who have no mobile phone find it difficult to call a remote doctor. And secondly, women with less education had to be assisted to utilise mobile phone-based telemedicine [59]. Many challenges that may hinder women of reproductive age to access maternal healthcare services has been outlined, however a research gap exists on how these challenges can be alleviated to capacitate/empower women of reproductive age to access maternal healthcare services.
Risk of bias across studies

All studies scored between 71.4 % and 100 %. One of the included studies scored the highest quality score of 100% [61]. Two of the included studies scored 86 % respectively [60, 62]. One study scored the quality score of 71.4 % [59].

Discussion

Summary of evidence

This scoping review maps the available literature on access to health care information by women of reproductive age in LMICs. It also provided a general overview on what factors contribute to women of reproductive age in LMICs not to access health care information? Evidence provided information on the following themes: accessibility, financial accessibility, connectivity as well as challenges which are being faced by women of reproductive age to access healthcare services. The findings of this study show that access for health services indicators was below the UHC. It also showed that women with high education are more accessible to maternal healthcare services than those with low education. Furthermore it revealed that maternal, neonatal and child healthcare (MNCH) gap do exist. It also provided evidence on demand and supply side initiatives such as transport vouchers and maternal healthcare services vouchers. The findings of these study show incremental cost-effectiveness of exposure to SMS text messages during the provision of maternal healthcare services. Evidence also show that telemedicine reduced travel restrictions, treatment expenses and apprehension regarding sexual and reproductive health.

Study findings shows that access for health services indicators was below UHC. Similar to our findings a study done in Nigeria by Aregbeshola et al., (2017) has found that about 10-20% of the monthly household income was spent on healthcare by 46.8% of respondents. It further found that a total of 97.9% of respondents had no health insurance coverage [30]. Another study also conducted in Nigeria by Okoronkwo et al., (2015) found that cost of medical treatment and not having insurance coverage was a major financial barrier to utilization and treatment services [64]. These two above mentioned studies are in agreement with our findings in LMICs. Similarly a study conducted in High Income Countries in New Jersey by Holstein et al., (2017) revealed that patient access to care under 10 large insurance plans varies by plan, but overall was difficult. Furthermore women with high education are said to be more accessible to maternal healthcare compared to those with low education this could be due to the fact that educated women are more exposed to more information than non-educated women. Study by Vidler et al., (2016) has found poor education as one of the factor that hinder accessing of maternal healthcare services [54]. Contrary to our findings, a study conducted in Pakistan by Panezai (2017) has found that distance, transport, staff availability, income, service hours and service organization are some of the barriers to maternal healthcare services [65]. Furthermore our study revealed that maternal, neonatal and child healthcare (MNCH) gap does exist. This could be due to the challenges or barriers that hinder the access to maternal healthcare services in low research settings. Similar to this Ashgari et al., (2018) in urban slums of Lagos, Nigeria has found that a total of 80.3% of the respondents had an estimated travel distance ranging from 6 to 10 km to reach a health care facility [30]. Contrary to this study some other barriers revealed by a study conducted in Nepal by Paudel et al., (2018) revealed that low focus of primary healthcare on engagement and empowerment, Quality of care: poor acceptance, Feeling unsafe and uncomfortable in health facilities and Health governance: Failure in delivering healthcare services during pregnancy and delivery are some of the challenges identified [66]. Our study found that demand and supply
side initiatives such as transport vouchers and maternal healthcare services vouchers are effective and may not require significant amount of resources. However contrary to our findings, a study conducted in Ghana on fee-free maternal health care services found that direct costs associated with antenatal care in the public health-care facilities were still a significant barrier to pregnant women who wanted to utilize services from these facilities [43]. Contrary to our findings, a study conducted in India by Sahoo et al., (2017) found that service providers also experience barriers that may hinder service provision such as physical access and facilities [36]. Another study similar to our findings conducted in Bangladesh by Wahed et al., (2017) on sex workers access to sexual and reproductive healthcare services revealed that financial problems, shame about receiving care, unwillingness of service providers to provide care, unfriendly behaviour of the providers and distance to care were some of the challenges that prevent them from receiving sexual and reproductive health care service [41]. The findings of these study show incremental cost-effectiveness of exposure to SMS text messages during the provision of maternal healthcare services. This is in agreement with a 2016 systematic study findings that showed incremental cost-effectiveness of exposure to SMS text messages during the provision of maternal healthcare services [6]. Our findings are also in agreement with a study conducted in Afghanistan by Yamin et al., (2018) that 81.7% of the participants were willing to receive health messages via a mobile phone. The same study also revealed that automated voice call was the most preferred method for sending health messages. More than 90% of women are willing to receive reminders for their children's vaccination and antenatal care [67]. Evidence also show that telemedicine reduced travel restrictions, treatment expenses and apprehension regarding sexual and reproductive health. In high income countries a study by Jandovitz et al., (2018) which was conducted in organ transplantation patients was in agreement with our findings that telemedicine has the potential to improve the healthcare delivery model by providing increased patient to healthcare team interactions and access, which optimize engagement and outcomes [68].

The Sustainable Development Goal target 3.7 also focuses on the universal access to sexual and reproductive health care services achievable by 2030 [69]. WHO recommendations on health promotion interventions for maternal and new-born health stipulated 12 recommendations to strengthen maternal and new born health. Two of the recommendations which are: interventions to promote awareness of human, sexual and reproductive rights and the right to access quality skilled care as well as community mobilization through facilitated participatory learning and action cycles with women's groups also highlighted that women should be empowered with relevant information and knowledge to access health care services.

Limitations

A number of challenges were reported associated with the access of health care information such as absence of accessible health facilities, insufficient workforce, insufficient health budget allocation, high user fees, direct out of pocket payment for health care services, financial constraints and transport constraints [61]. Bearing in mind that many LMICs are adopting the Universal Health Coverage to help them achieve Goal number 3 of the Sustainable Development Goals, it would be advisable and beneficial for the Ministry of Health and Social Services to explore interventions that will enable women of reproductive age to access maternal health care information without suffering any hardship.

Our study findings show that there is limited published literature specific to strategies in place that enable women of reproductive age to access health care information in general in LMICs. Therefore, we hope that this study's results prompt further studies to provide a contextual insight in these strategies to increase the use of maternal and
reproductive healthcare services. Considering that only two studies mentioned about interventions that can attract women of reproductive age to access maternal health care services in LMICs, we would like to recommend future pilot studies and randomized control trials to access strategies aimed at enabling women of reproductive age to access maternal health care information. We would like to recommend that future intervention programmes should be developed and implemented to help ensure quality and ensure desirable and quality maternal health care services outcomes. This study was however limited in that, we only included studies that were conducted between 2004 and recent. Studies conducted before 2004 were excluded.

**Strengths**

This study encompassed researches undertaken in diverse settings such as rural, urban and semi-urban, which gives a clear view of the practical experiences and challenges that may be faced when accessing maternal health care information in similar settings. Additionally, the full article screening tool was piloted, which resulted in improved reliability as confirmed by the degree of agreement results, that there was 80.77% agreement versus 68.64% expected by chance which constitutes a good agreement between screeners (Kappa statistic = 0.39 and p-value<0.05). In addition, the McNemar's chi-square figures indicate that there is no statistically substantial dissimilarity in the number of yes/no answers by the reviewer with p-value >0.05.

All primary studies incorporated underwent quality appraisal using an approved tool, the Mixed Method Appraisal Tool (MMAT) to assess the methodological quality. The other important strength of this study is the fact that there was no limitation on language because it included studies written in other different languages apart from English.

**Conclusion**

This study demonstrated that some strategies might be useful to expose a big number of women to receive maternal health care information without any challenges. It also indicated that there is a need for more research on evidence that enable access to maternal healthcare information by women of reproductive age in LMICs.

**Abbreviations**

PRISMA - ScR – Preferred Reporting Items for Systematic Review Extension for scoping review.

UNFPA – United Nations Population Fund

SDG – Sustainable Development Goal

AFHS – Adolescent Friendly Health Services

MMAT – Mixed Method Appraisal Tool

MHC – Maternal and Child Health

NCDs – Non-Communicable Diseases

LMICs – Lower and Middle Income Countries

PICOS – Population, Intervention, Comparison, Outcomes and Study setting
Declarations

Ethics approval and consent to participate (Not applicable)

Consent for publication (Not applicable)

Availability of data and material

All data generated or analysed during this study will be included in the published systematic review article.

Competing interests

The authors declare that they have no competing interests

Funding (Not applicable)

Authors’ contributions

JTS will conceptualize the study and design data collection methods under the supervision of TPM-T. DK will review the study. All authors will critically review and approve the final manuscript.

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Figures
Figure 1

Selection of sources of evidence