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Reproductive Health

REVIEW Open Access

Effect of mobile health application interventions on modern contraceptive use among women of reproductive age in sub-Saharan Africa: a systematic review

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Abstract

Introduction Sustainable Development Goal 3, target seven, aims to ensure universal access to sexual and reproductive health care services, including family planning information and education. Mobile health interventions may be an effective means to achieve this target. Mobile health (mhealth) involves the use of mobile phone applications (MPAs) and text messages (SMS) on devices such as cell phones to provide relevant information to improve well-being and health. Given the growing interest in the use of mobile health to improve healthcare delivery, especially in sub-Saharan Africa (SSA), up-to-date information must be available to guide practice.

Objectives To provide up-to-date evidence on the effectiveness of mhealth interventions in enhancing contraceptive use among women of reproductive age in SSA.

Methods We conducted a systematic review of the literature in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analysis guidelines. The review was guided by a protocol registered in PROSPERO and aimed to provide up-to-date evidence on the effectiveness of mhealth interventions in enhancing contraceptive use. The PICO framework guided the literature search, and the review was conducted with an information specialist. The literature search covered studies published from 1994 to 2022 in the following databases: Medline, CINAHL, PubMed CENTRAL, the Cochrane Library, and EMBASE. Two independent reviewers conducted the screening in three stages. The title, abstract, and full-text were screened to identify studies that met the inclusion criteria. Data were extracted using a standardised data extraction form, synthesised, and assessed for quality. The quality of randomised controlled trials (RCTs) was evaluated using the JBI critical appraisal tool for RCTs. The JBI critical appraisal tool for cross-sectional studies was used to assess the non-randomised studies. A meta-analysis was conducted for studies that met the meta-analysis criteria.

Results A total of 9,768 records were retrieved following the searches. Eight (8) studies were included in the final review: 6 RCTs, and 2 cross-sectional studies. A positive effect of mhealth on modern contraceptive use was reported

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in 4 out of the 8 studies, while the remaining 4 did not report any significant effect. A meta-analysis of data pooled from the 6 RCTs demonstrated a statistically significant effect of the intervention on contraceptive use (OR = 1.46, 95% CI: 1.11–1.92), indicating a meaningful increase in the likelihood of use among participants exposed to mhealth interventions.

Conclusions The effect of mhealth applications on modern contraceptive use was inconclusive based on vote counting among the 8 selected studies. However, findings from the meta-analysis of 6 RCT studies appear to suggest that mobile health interventions can significantly improve contraceptive use among women of reproductive age.

Keywords Women, Effect, Sub-Saharan Africa, Mobile health, Contraceptives

Background

The Millennium Development Goal (MDG) five, which sought to address maternal health, through Target 5 A, was not achieved in most low-and middle-income countries (LMICs), particularly those in sub-Saharan Africa (SSA) [1]. Although various interventions have been recommended as effective strategies for addressing maternal deaths in SSA, maternal mortality remains unacceptably high in the region [2]. In 2017 for example, SSA accounted for approximately two-thirds of all global maternal deaths [2]. More recently, available literature from 2020 showed that the maternal mortality ratio in SSA was 545 per 100 000 live births. This figure is unacceptably high when compared with the 2020 global average of 223 per 100,000 live births [3].

One of the recommended effective strategies for tackling the maternal mortality burden in the region is the promotion and use of modern contraceptives [1, 2, 4]. This is because contraceptive use can prevent unwanted and unintended pregnancies, which could ultimately reduce maternal deaths [4]. Although the benefits of modern contraceptives are well documented, their use in SSA remains low compared with other regions. For example, a recent 2022 study that analysed data from 38 SSA countries' demographic and health surveys to examine modern contraceptive use estimated the prevalence of modern contraceptive use to be 22% [4]. This indicates that, on average, fewer than one in four women of reproductive age in the region are using modern contraceptive methods. Such a low level of uptake highlights substantial unmet need for family planning services and suggests persistent barriers to access, availability, affordability, and acceptability of contraceptive methods [4]. It also underscores the potential for interventions, such as mobile health (mhealth) strategies, to play a critical role in improving awareness, demand, and utilisation of modern contraception across the region [5].

Mobile health (mhealth) interventions are highlighted as an effective means to improve the use of modern contraceptives, especially in SSA [5]. Mobile health involves the use of mobile health applications and devices, such as cell phones, to improve well-being and health [6]. There are over 300 mobile applications on Apple iTunes and Google play store that support contraception use and fertility management, and their effectiveness is strongly supported by evidence from recent systematic reviews examining mobile applications and contraceptive use [7, 8]. One such review evaluated 22 studies that assessed the impact of mobile applications (mhapp) on contraceptive use in developed countries [7]. The authors concluded that mobile applications were useful for improving contraceptive use [7]. Another review of RCTs evaluating the impact of mobile applications on contraceptive adherence reported that oral contraceptive use among participants was high in all 5 studies included in the review [9].

Evidence from other reviews of LMICs further supports these findings. For instance, Aung and colleagues [10] reported that mhealth improved contraceptive use among women who were randomised to a mobile health intervention compared with those who did not receive the intervention. Their 2020 review, however, appears to be the most recent publication that examined the effectiveness of mobile health interventions on contraceptive use in LMICs [10]. Given the growing interest in the use of mobile health to improve healthcare delivery, especially in SSA, up-to-date information must be available to guide practice. The present review was therefore designed to provide up-to-date evidence on the effectiveness of mhealth interventions in SSA. Thus, our review was designed to identify any existing and up-to-date evidence on the effectiveness of mobile health applications in enhancing contraceptive use among women of reproductive age in SSA.

Methods

The review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines and was guided by a registered protocol in PROSPERO (PROSPERO 2022 CRD42022333169) [11, 12]. The Population, Intervention, Comparison, and Outcome (PICO) Framework (Table 1) was used to guide the literature search and selection of studies for inclusion. The framework was also used to structure and report the review findings for the included studies.

Table 1 Inclusion and exclusion criteria

PICO	Inclusion Criteria
Population	Women of reproductive age (15–49 years)
Intervention	Mobile health application interventions including E.g, messaging platforms, short messaging system (SMS), mobile applications.
Comparison	Alternative to mobile application
Outcome	Contraceptive use/uptake among women of reproductive age (15-49yrs).
Setting	Sub-Saharan Africa
Study types	a) Quantitative RCTs design or quasi-experimental (including controlled comparative and/or before and after design) b) Observational studies such as cohort, case-control and cross-sectional designs.

Literature search strategy

A search strategy was developed in consultation with an information specialist. The strategy was piloted, refined, and used to search five electronic databases: Medline, CINAHL, PubMed CENTRAL, the Cochrane Library of Systematic Reviews, and EMBASE. A complementary hand search, including a citation search follow-up, a Google Scholar search, and a search of the reference lists of included studies, was conducted to identify studies that the database search may have missed. Searches were completed in June 2022 using appropriate Boolean operators that incorporate free search terms and Medical Subject Headings (MeSH). The exact terms for the literature search are listed in the appendix.

Inclusion and exclusion criteria

Inclusion criteria

We included quantitative studies that (i) evaluated the effectiveness of mobile health applications on modern contraceptive use, (ii) focused on women of reproductive age (15–49), (iii) used randomised control trials or quasi-experimental, and observational study designs (iv) were conducted in sub-Saharan Africa, and iv) published between 1994 (after the International Conference on Population and Development- ICPD) and 2022, and are available in English language (Details in Table 1). The International Conference on Population and Development (ICPD), which initiated family planning as an integral part of sexual and reproductive health, was first held in 1994. The ICPD has evolved over the years, and it is now recognized as the International Conference on Family Planning (ICFP).

To be included, women had to be part of studies that used a mobile health intervention for family planning, such as messaging platforms or short messaging system (SMS)/text messages or mobile phone applictions (MPAs). Mobile health intervention for family planning was therefore defined as the use of mobile devices and wireless technology to educate clients and empower them to use family planning services [13]. The studies included in the review also focused primarily on women who use contraceptives. Contraceptive use was therefore defined as the uptake of a modern contraceptive method by a woman of reproductive age during the implementation of a mobile health intervention. These women were current users of a method at the time of being interviewed. The contraceptive methods included any of the following: implants, Intra Uterine Devices (IUDs), emergency contraceptives, oral contraceptives, injectables, patches, diaphragms and cervical caps, sterilization (male and female), condoms (male and female), vaginal rings, and spermicidal agents (foams, gels, suppositories, creams, etc.)

Exclusion criteria

Studies that did not meet the above inclusion criteria were excluded from the review (Table 1). Studies written in a language other than English, as well as studies where full texts could not be obtained, were excluded.

Study selection

The search outputs were transferred to the EndNote reference manager for screening and removal of duplicates. Two independent reviewers (KKA and IB) used the inclusion criteria to screen all the titles and abstracts of the search outputs. After duplicates were removed, the full texts of the abstracts that met the inclusion criteria were imported into Joanna Briggs Institute (JBI) Sumari (a web-based application that supports the systematic review process). The two reviewers independently screened the papers in JBI to ascertain their relevance. Disagreements were resolved by a third reviewer (RA).

Data extraction

We used a standardised data extraction form to extract relevant data from the included studies. The data extraction form captured study details such as characteristics (author, year of publication, study setting, study type, study design, participant details, and study outcome measures), methods (including intervention details), and key findings. Two independent reviewers (KKA and IB) used the data extraction form to extract the data. The extracted information was then imputed into JBI Sumari for further analysis. Disagreements were resolved by a third reviewer (RA).

Data synthesis and analysis

We first categorised all the studies according to their study designs. Quantitative statistical data (e.g. Odd Ratios, Confidence Intervals, and p-values) were extracted to support meta-analysis as summarised in Table 2. Where meta-analysis was not feasible, we undertook a narrative synthesis, including vote counting based on the direction of effects across studies [11]. Each effect estimate was therefore categorized as positive, negative, or no clear effect based on the observed direction of effect alone. The total number of positive effects was then compared with the number of negative effects, and no clear effect.

The meta-analysis was conducted on studies that reported sufficient statistical information, with a focus on RCTs. Analyses were performed in JBI Sumari to generate pooled estimates of effect. A random-effects model was applied to account for between-study heterogeneity, with results presented as pooled estimates of contraceptive use with corresponding 95% confidence intervals. Statistical heterogeneity was assessed using the I^2 statistic.

Quality assessment of the included studies

Two reviewers (KKA and IB) independently assessed and rated the methodological quality of the included studies. The RCTs were assessed via the JBI critical appraisal tool for RCTs [22]. The non-randomised observational studies were similarly assessed using the JBI critical appraisal tool for cross-sectional studies [23]. Discrepancies were resolved by a third reviewer (RA). The JBI critical appraisal tool for RCTs had 13 questions that were used to assess the quality of the studies (Appendix 2) [22]. Each RCT paper included in the review was assessed based on these 13 questions. A 'yes', 'no', or not/applicable response was required for each paper, and the paper was classified as 'high', 'moderate', or 'low' quality based on the number of 'yes' responses [22]. Similarly, the JBI critical appraisal tool for cross-sectional studies was used to assess the quality of the cross-sectional studies used in the review [23]. The tool had 8 questions that were used to assess the quality of the studies. Each cross-sectional study included in the review was assessed based on these 8 questions (Appendix 2) [23]. A 'yes' or 'no' response or not/applicable was required for each paper, and the paper was classified as 'high', 'moderate' or 'low' quality based on the number of 'yes' responses [23].

Results

Overview of the included studies

A total of 9,768 records were retrieved following the search. After the removal of 1,364 duplicates, 8,404 were left for screening. Following title and abstract screening, 8,379 articles were excluded, leaving only 25 articles for full-text screening. Following full-text screening, 17 articles were excluded for various reasons (see Fig. 1). Thus, eight articles met the review criteria and were included in the review. The PRISMA flow chart (Fig. 1) provides a summary of how the studies were selected.

Study characteristics

Study setting, population, and sample

Among the 8 included studies, four of them were conducted in Kenya [16, 18, 19, 21], one in Nigeria [14], one in Uganda [15], and one in Mozambique [17]. The study by Hu and colleagues is a global multicountry study and includes eight SSA countries (Angola, Ethiopia, Burundi, Malawi, Senegal, Tanzania, Uganda, and Zimbabwe); therefore, we extracted and analysed the data for these eight countries [20].

The main study participants for all 8 studies were women of reproductive age (15–49), with an overall sample size of 115,672. The smallest sample size was 260 [16] and the largest sample size was 94,672 [20]. Two of the studies [15, 16] included other participants in addition to women of reproductive age, and we extracted only the data reported for the women and the age range studied (15–49). The study by Harrington and colleagues [16] included couples as participants. The study by Nuwamanya and colleagues [15] included men of reproductive age. Data were not extracted for these participants as they were not the target.

Table 2 Summary of effectiveness scores

Author	Outcome Measured	Frequency (%)- Intervention Group (before and after, where applicable)	Control Group (%)	*p* values	Direction of Effect (vote count for contraception)
Babalola et al.,2019 [14]	Modern contraceptive use	22.9, 37.4	20.9, 20.6	< 0.01	Positive Effect
Nuwamanya et al., 2020 [15]	Modern contraceptive use	69.9, 82.2	73.7, 80.2	< 0.01	Positive Effect
Harrington et al., 2019 [16]	Modern contraceptive use	69.9	57.4	0.02	Positive effect
Leight et al.,2022 [17]	Modern contraceptive use	48.6	47.4	0.09	No Clear Effect
Johnson et al., 2017 [18]	Modern contraception use	79.7	79.6	0.94	No clear Effect
Unger et al., 2018 [19]	Modern Contraception use	73%	57	0.03	Positive Effect
Hu et al., 2020 [20]	Modern contraception use	-	-	> 0.05	No Clear Effect
Lee et al., 2019 [21]	Modern contraceptive use	-	-	0.30	No clear Effect

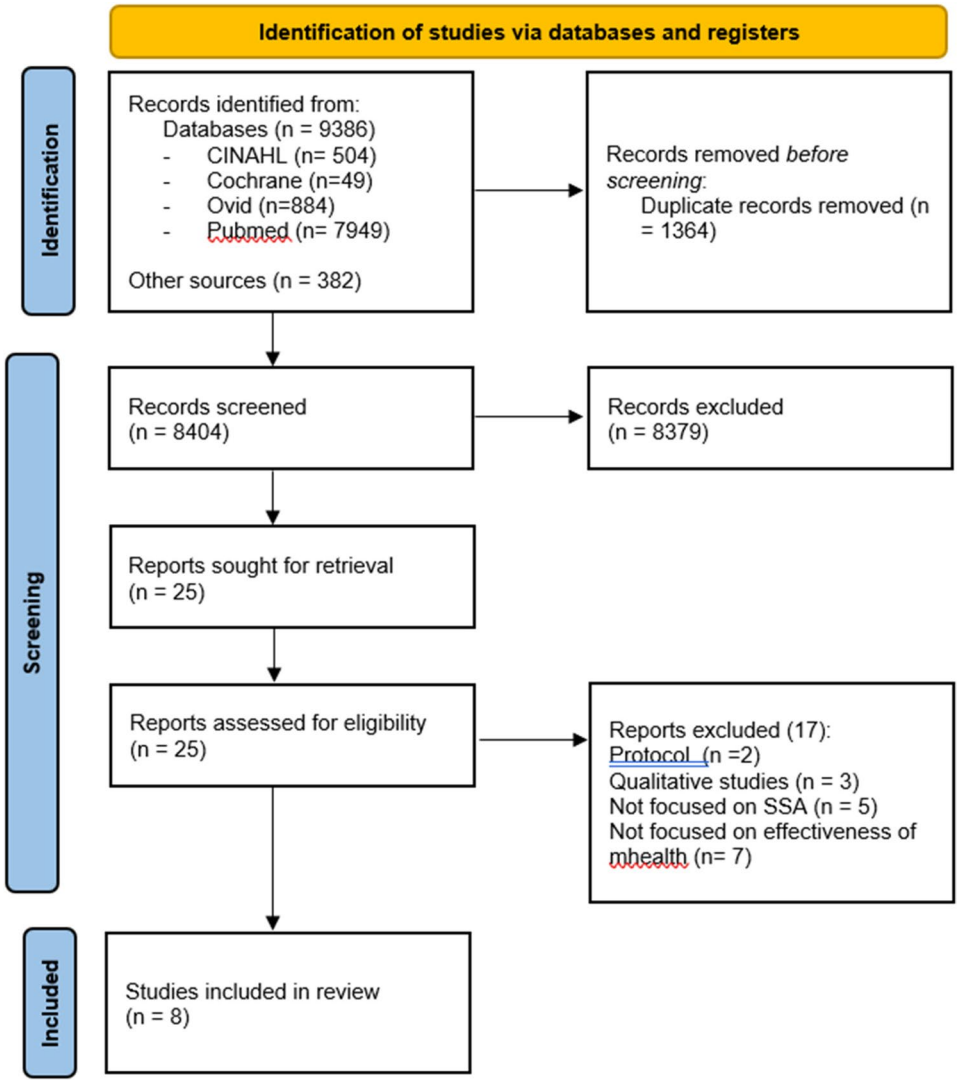


Fig. 1 PRISMA flow chart

Study types and design

Of the eight studies, six were RCTs [14–19], whereas the remaining 2 were observational studies [20, 21]. The two observational studies were based on the analysis of secondary data. One study analysed existing data from Kenya [21], and the other study, a multicountry study, analysed existing data from eight SSA countries (Angola, Ethiopia, Burundi, Malawi, Senegal, Tanzania, Uganda, and Zimbabwe) [20]. Table 3 summarises the study characteristics.

Study focus

The main outcome of this review was modern contraceptive use. The included studies evaluated two types of mobile health interventions: mobile phone applications (MPAs) and SMS/Text platforms. Two studies [17, 21], examined the effect of SMS reminder interventions on contraceptive uptake. Hu et al. [20], analysed secondary data to evaluate the impact of an SMS intervention provided to women in 9 SSA countries and 4 South Asian countries to promote contraception use.

Two other studies assessed the implementation of a mobile text message platform (WAch Mobile SMS App) designed to promote access to contraceptive services for women of reproductive age [16, 19]. In one study, Unger and colleagues [19] evaluated women's use of the WAch Mobile SMS platform to access contraceptive services, whereas Harrington et al. [16] examined the frequent use of a variant version of the WAch platform to access contraceptive services. Another text message platform, m4RH, developed by FHI360, was evaluated by Johnson et al. [18] to determine its use by women to access contraceptive services.

Two studies [14, 15], evaluated mobile phone applications (MPAs) installed on participants' phones. The MPA used by Nuwamanya et al. [15] was designed to empower

Table 3 Study characteristics

Authors	Setting (Country)	Study Design	Population	Sample Size	Outcome (s) measured
Babalola et al., 2019 [14]	Nigeria	Randomized Control Trial (RCT)	Women of reproductive age (WRA)	480 (240 per arm)	Contraceptive use
Nuwamanya et al., 2020 [15]	Uganda	RCT	Students (including WRA)	958 (479 per group)	Contraceptive use
Harrington et al., 2019 [16]	Kenya	RCT	WRA and couples.	260	Contraceptive use
Leight et al., 2022 [17]	Mozambique	RCT	WRA	5370	Contraceptive use
Johnson et al., 2017 [18]	Kenya	RCT	Participants of the m4RH program (includes WRA)	13,629	Contraceptive use
Unger et al., 2018 [19]	Kenya	RCT	WRA	300	Contraceptive use
Hu et al., 2020 [20]	SSA & Asia	Cross-sectional study (CS)	WRA	94,675	Contraceptive use,
Lee et al., 2019 [21]	Kenya	CS	WRA	31,059	Contraceptive use

WRA Women of reproductive age, *RCT* Randomised control trial, *CS* Cross-sectional

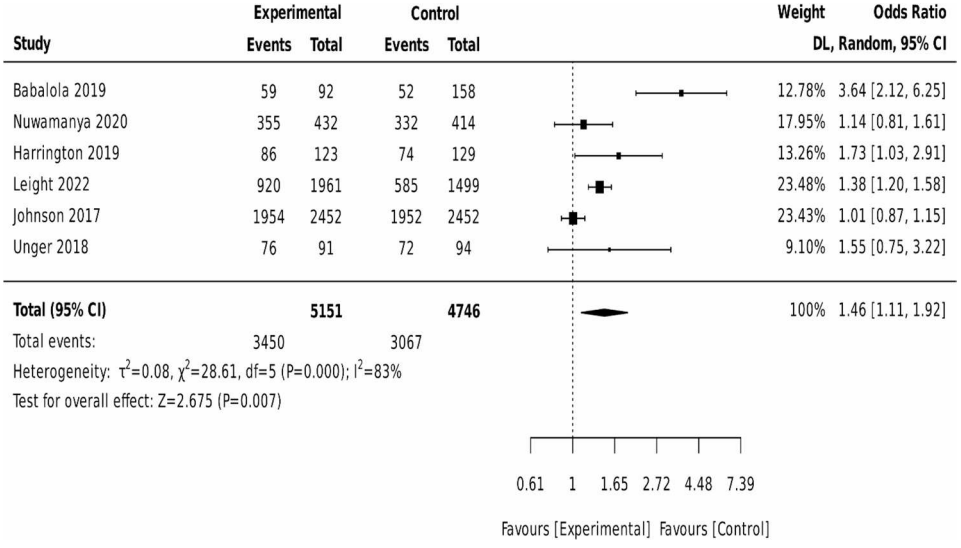


Fig. 2 Pooled Effect of Mhealth on Modern Contraceptive Use

clients to purchase SRH goods and services. Some of these goods and services include HIV testing, STI diagnosis, and modern contraceptives [15]. The MPA implemented by Bablola et al. [14] is known as the Smart client digital health tool, and it uses a drama format to educate participants about modern contraceptives. The drama format is similar to behaviour change communication through television and was adapted for mobile phones, using shorter, simpler stories in a series of episodes. It is based on social learning theory, which relies on the fact that people learn through observation and imitation [14].

Impact of mobile applications on modern contraceptive use

Four out of eight studies [14–16, 19] reported a positive effect of mobile health on modern contraceptive use based on the vote count. The meta-analysis, incorporating six studies, demonstrated a statistically significant pooled effect (OR = 1.46, 95% CI: 1.11–1.92; $p = 0.007$), suggesting that the intervention group (mhealth users) had 46% higher odds of contraceptive use compared with the control group (Fig. 2).

When the individual RCT studies were evaluated, three of the studies reported odds greater than one and statistically significant associations: Babalola 2019 [14]; Harrington 2019 [16] ; Leight 2022 [17]. The study by Unger also showed odds higher than one, but this was not statistically significant. Two other studies also showed no significant effect: Johnson 2017 [18]; Nuwamanya 2020 [15] (Fig. 2). Although this was the case for the RCT studies, there was also high heterogeneity (I^2 = 83%), suggesting that the study findings could also reflect true differences in populations and interventions (Fig. 2).

The two observational studies [20, 21] reported that mobile health did not change modern contraceptive use (Table 2). The study by Hu et al. [20] suggested that although mobile health alone does not have a positive effect on contraceptive use, it is beneficial (shows

Table 4 Summary of findings synthesised from included studies

Authors	Setting (Country)	Study Design	Key Findings	Intervention	Quality Assessment
Babalola et al., 2019 [14]	Nigeria	RCT	The mhealth application was effective in encouraging women to adopt a modern contraceptive method.	Beta life version of the Smart Client digital	Moderate
Nuwamanya et al., 2020 [15]	Uganda	RCT	The MPA increased contraceptive use	Mobile phone app (MPA)	High
Harrington et al., 2019 [16]	Kenya	RCT	Women randomised to SMS were 26% more likely to be using a modern contraceptive method at 6 months.	Mobile WACh XY application	Moderate
Leight et al., 2022 [17]	Mozambique	RCT	Women who received text reminders were more likely to use a modern contraceptive method	Text reminders	Moderate
Johnson et al., 2017 [18]	Kenya	RCT	m4RH did not increase the likelihood of the consumer or the consumer's partner using contraception	m4RH (an mhealth FP program in Kenya)	low
Unger et al., 2018 [19]	Kenya	RCT	SMS increased early contraceptive use	Mobile Women, Adolescent and Children's (WAch) platform which delivered SMS to participants	Moderate
Hu et al., 2020 [20]	SSA & Asia	Observational	Receiving FP-related SMS in addition to other services was associated with higher odds of modern contraceptive use.	Mobile-based health intervention through SMS-based family planning communication	High
Lee et al., 2019 [21]	Kenya	Observational	mhealth alone could not improve contraceptive knowledge and use. It is more effective when used with other existing channels	Mhealth- Family Planning messages on mobile phones	High

effectiveness) when it is integrated into routine antenatal healthcare services.

Quality of included studies

Only one RCT met the assessment criteria for a high-quality study [15], and another one was judged as having low quality [16]. The remaining four RCTs were judged as moderate-quality studies [14, 17–19] (Table 4 and Appendix). The moderate quality of majority of the RCT studies could also have contributed to the high heterogeneity (I^2 = 83%) observed (Fig. 2).

The two observational studies were rated as high quality and had a response of 'yes' for all domains. This assessment was performed via the JBI critical appraisal tool for cross-sectional (Tables 4 and Appendix 2).

Discussion

This review has provided up-to-date information for us to understand the latest evidence on the effect of mobile health applications in enhancing contraceptive use, i.e., building on earlier evidence reported by previous reviews. The majority of the participants studied were young (18–35 years), which was consistent with participants described in previous reviews [10]. Overall, eight studies were reviewed, and they provided quantitative evidence on the effect of mobile health applications on modern contraceptive use. The evidence reported from four studies suggests that the use of mobile applications could improve contraceptive uptake among women of reproductive age [14–16, 19]. Additionally, from the meta-analysis using 6 RCTs, the intervention group (mhealth users) had higher odds of contraceptive use compared with the control group. Our findings agree with a previous review of the literature from LMICs, SSA and Asia by Aung et al. [10]. For example, in their review, Aung et al. [8] reported that three out of 8 studies from LMICs showed a positive effect on contraceptive use. Two of these studies were from SSA, and one was from Asia. Regarding the number of studies that reported a positive effect of mhealth on contraceptive use in SSA, our findings differed from those of Aung et al. [8]. Aung et al. [10] included two studies from SSA and reported a positive effect compared with our review, which had four studies showing a positive effect [10]. The differences in these studies could be attributed to the different populations and durations under study. The review by Aung et al. [10] was carried out in 2019 in LMICs, including other Asian countries, whereas our study was carried out in 2022 and focused primarily on countries in SSA [10]. The findings from our study, compared with those of Aung et al. [10], seem to suggest that the use of SRH mhealth in SSA has increased in the last three years since the Aung et al. [10] review was carried out. These findings also suggest that these mhealth platforms have a positive effect on the use of modern contraceptives among women of reproductive age in the region.

Of the studies that showed a positive effect in our review, two evaluated MPAs, whereas the other two

evaluated text messaging (SMS) [14, 15, 17, 19]. On the one hand, the use of unidirectional (one-way) SMS to improve contraceptive use, as observed in our study, differed from that reported by Aung et al. [8] and some additional reviews carried out in developed countries [7, 9]. On the other hand, the use of a combination of bidirectional and interactive styles to improve contraceptive use, as shown with the MPAs in our study, was consistent with findings from similar reviews [10]. These findings from the previous reviews seem to suggest that the use of MPAs is more likely to improve contraceptive use than unidirectional SMS. This was evident in the meta-analysis aspect of our study, since only one of the three studies showed statistical associations using unidirectional SMS. The two significant studies used an MPA and bidirectional SMS. These results seem to suggest that in promoting the use of mhealth to improve modern contraceptive use, MPAs and bidirectional SMS could be more effective options as compared with unidirectional SMS.

The findings from our review have implications for policy and practice in SSA. This study also has implications for future research, especially in Ghana. The use of digital technologies to promote health in Ghana is already gaining ground, and a policy on digital health was recently launched [24]. The effectiveness of digital health applications for modern contraceptive use among adolescents and women of reproductive age is, however, not known in the country. Future research on the effectiveness of MPAs on health service indicators such as modern contraceptive use in the country should therefore be conducted to inform policy and practice.

Limitations and strengths

This review has some strengths and limitations that should be noted. One major strength of our study is that we conducted a meta-analysis where we pooled together the differences in contraceptive use across the selected studies. This was not done in previous systematic review studies, such as the study by Aung and colleagues that looked at the effectiveness of mhealth on contraceptive use in LMIC. Although the results from the meta-analysis must be reported with caution due to the high heterogeneity, our review provides more up-to-date and stronger evidence on the effect of mhealth on modern contraceptives as compared to the previous study by Aung and colleagues. It is also the first review to focus primarily on SSA. The search for this review was also registered in Prospero, and it followed an internationally recognised best practice for systematic reviews known as PRISMA.

The main limitation of the review, however, was that the databases used were first of all restricted by language and date of publication. Some eligible articles could therefore have been missed. Additionally, since only peer-reviewed articles were included in the search, other possible sources of information that could have added to the depth of information, (Eg. online thesis, reports, and conference presentations) were also missed. The moderate quality of the majority of the RCTs and the high heterogeneity observed also means that our results have to be interpreted with caution.

Conclusion

This present systematic review was conducted to examine the effectiveness of mobile health applications on modern contraceptive use in SSA. The quantitative studies included in the review revealed that approximately half of the mobile health interventions had a positive effect on modern contraceptive use, whereas the remaining interventions had no effect. The results of the meta-analysis, however, suggest that mobile health interventions can improve contraceptive use. Policy makers can therefore consider mobile applications as a viable option for improving modern contraceptive use. This has to be done with caution, however, because the improvements may vary depending on the type of mobile health platform used (i.e. mobile phone application or SMS messages).

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12978-026-02415-9.

Supplementary Material 1.

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Authors' contributions

RA, JG and KKA conceptualised the study, and RA supervised the writing of the paper. KKA coordinated the writing of the paper and contributed to the screening of the journal articles together with IB. JG, IB, FI, AK, AEY, JM and IAA contributed to writing the paper and made critical revisions. All the authors approved the final draft.

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Data availability

All relevant materials used in this review are available and presented in the paper. Additional materials used are also available and can be presented upon request.

Declarations

Ethics approval and consent to participate

None.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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