

**Table 2.** Summary of literature on digital maternal health promotion

Title, author(s) and year of publication	Aim of study	Context	Study design	Type and purpose of digital health	Key findings from the study	Implications of findings towards attaining health security and SDG 3
Rural women perceptions of digital media influence on awareness creation about maternal health information in Minna, Nigeria [34]	To investigate how rural women perceived digital media in awareness creation on maternal health	Minna, Nigeria	Quantitative research – survey questionnaire	Digital media for maternal health awareness creation amongst rural women	Social networking media like Facebook, Whatsapp groups, blogs and support forums serve as a source of maternal health information for women living in rural areas. This enables a sense of community	The expansion of resources such as affordable internet, ubiquity of smart mobile phones, and instant messaging can effectively support maternal health promotion in underserved settings. These resources, relevant person-centered content and self-efficacy associated with digital media would extend the reach, communication and active participation of pregnant women to meet their health needs and plan accordingly
Effects of mHealth interventions on improving antenatal care visits and skilled delivery care in low- and middle-income countries: systematic	To summarize the effect of mHealth interventions on the uptake of ANC visits, skilled birth and facility deliveries among the pregnant women in Low- and	Resource limited settings in selected LMICs	Systematic review and meta-analyses	mHealth to manage ANC visits	mHealth interventions for two-way communication increases ANC utilization and visits in resource limited settings	The acceptance of mHealth interventions offers several opportunities of health workers to facilitate health promotion amongst pregnant women in preparation for childbirth and postpartum. In this way, the risk of fatal complications can be reduced.

review and meta-analysis [30]	Middle- Income Countries (LMICs)					
Digital health technologies for maternal and child health in Africa and other low- and middle-income countries: cross-disciplinary scoping review with stakeholder consultation [20]	To conduct a scoping on the use of digital health interventions for Maternal and Child Health (MCH) in LMICs	sub-Saharan Africa	Scoping review	Mobile apps, wearables, web-based applications, SMS text messaging and social media were identified as technologies to develop digital health for easier access to services and to facilitate communication with healthcare workers.	The authors advocate for the inclusion of key role players within communities in LMIC settings during the design process of digital health technologies for MCH. Community-based co-design is identified as the most suitable approach in designing digital health interventions for MCH.	For the success of digital maternal health promotion to become a reality that ultimately improves MCH outcomes, the meaningful engagement and active participation of all key stakeholders in the design process of digital health interventions is critical, especially in underserved or low-resource settings. As a result, maternal health education, information and related advocacy can become inclusive and contribute to improving MCH services access and utilization to meet SDG 3
Leaving no woman or girl behind? Inclusion and participation in digital maternal health programs	To review literature on digital maternal health programs across sub-Saharan	sub-Saharan Africa	Literature review	Digital health interventions for maternal health promotion	Digital maternal health seems to always exclude women based on digital device ownership, digital literacy and disabilities.	A government-private led partnership that seeks to subsidize or incentivise digital maternal health promotion targeted at girls and women of reproductive age would likely minimize the causes of exclusion, increase access, use as well as participation in

in sub-Saharan Africa [35]	Africa that excludes the most vulnerable women and girls					maternal health utilization.
Improving maternal health services utilization in Ghana: Should digital health be considered? Correspondence [12]	To highlight the benefits of digital health towards improving Maternal and Child Health service utilization	Ghana	Correspondence	Telemedicine, digital health technologies, mHealth, mobile devices for improving access to information and maternal health Service	Digital health interventions encourage behavioural changes.	Since health promotion is largely concerned with advocacy for preventive measures to avoid health vulnerabilities and the adoption of a healthy lifestyle, Digital health interventions can assist community health workers to provide relevant up-to-date maternal health information to pregnant women and first-time mothers, with a chance of reducing the risks and vulnerabilities associated with ante- and post- natal care. In this way, Digital health interventions contribute to reducing the rates of infant and maternal morbidity thereby ensuring an inclusive universal healthcare.
A mobile phone-based multimedia intervention to support maternal health is	To assess the acceptability and feasibility of a mobile application to support maternal health	Rural southwestern, Uganda	Randomized control trial – qualitative and quantitative mixed	Mobile app (MatHealth) to access health education content; for appointment reminders and	Using MatHealth enabled the pregnant women and their spouses’ access to relevant health information that positively influenced their adherence to antenatal care utilization and	Access to asynchronous educational health content (video and audio) will have a positive impact on adherence, awareness, communication and advocacy of best maternal health practices in underserved settings of sub-Saharan African countries.

<p>acceptable and feasible among illiterate pregnant women in Uganda: qualitative findings from a pilot randomized controlled trial [36]</p>	<p>amongst illiterate pregnant women in Uganda</p>		<p>methods</p>	<p>calling function</p>	<p>proper diet practices</p>	<p>However, strategies to address socio-cultural, technical and economic issues threaten the success of digital maternal health promotion.</p>
<p>Reflections on digital maternal and child health support for mothers and community health workers in rural areas of Limpopo Province, South Africa [37]</p>	<p>To explore experiences of mothers, community leaders, and community health workers (CHWs) on mHealth for digital maternal and child health support in rural areas</p>	<p>Limpopo, South Africa</p>	<p>Qualitative research</p>	<p>Digital apps to support maternal and child health awareness and communication</p>	<p>Digital apps enhance communication and support the sharing of relevant information about the pregnancy journey and after delivery. Socioeconomic constraints and network connectivity impacts user satisfaction.</p>	<p>Infrastructural deficiencies, asynchronous use of digital media, digital literacy, sociocultural beliefs and peer support groups are highlighted as key areas that influence digital maternal health promotion if nursing mothers, and pregnant women are to adopt a healthier lifestyle and utilize accessible care services in a sustainable manner.</p>

<p>mHealth-based health promotion intervention to improve use of maternity care services among women in rural Southwestern Uganda: iterative development study [38]</p>	<p>To develop a patient-centered text and audio messaging mHealth intervention to support women's use of maternity care services in Mbarara district, southwestern Uganda.</p>	<p>Southwestern, Uganda</p>	<p>Qualitative research</p>	<p>mHealth to facilitate the use of maternal care services</p>	<p>When target users participate in the design of an intervention, they develop a sense of ownership. Digital health interventions such as mHealth supports personalization of educational content to suit the needs and preferences specific to pregnant people.</p>	<p>Inclusion of end users in the co-development of digital health interventions is likely to yield the intended positive health outcomes. Reducing maternal mortality towards achieving health security becomes a reality when diverse groups are able to participate and benefit from digital health promotion awareness.</p>
<p>Evaluating the feasibility, acceptability, and preliminary efficacy of support moms-Uganda, an mHealth-based patient-centered social support intervention to improve the use of maternity</p>	<p>To evaluate a mHealth messaging app to promote maternity service use among pregnant women in Uganda.</p>	<p>Southwestern, Uganda</p>	<p>Randomized control trial – qualitative and quantitative methods</p>	<p>Support moms-Uganda mHealth to promote the use of maternal services</p>	<p>Digital maternal health interventions are accepted when the technology is easy to use, useful, interesting and engaging.</p>	<p>Digital maternal health promotion that leverages social support networks, personalized educational content and timely messaging influence the uptake of maternal care services. To achieve SDGs 3 and health security, there is a need to scale such interventions through collaborative partnerships between the government and private sector. This will help to collect relevant data for informed decision-making that includes hard-to-reach populations.</p>

services among pregnant women in rural Southwestern Uganda: randomized controlled trial [27]						
Evaluating the effect of maternal mHealth text messages on uptake of maternal and child health care services in South Africa: a multicentre cohort intervention study [39]	To evaluate the effects of mHealth intervention on maternal health services uptake and use.	Johannesburg inner-city, South Africa	Quantitative research	One-way maternal health information sent twice in a week to pregnant women receiving ANC.	When pregnant women receive maternal health information via SMS, the utilization of ANC visits increases.	The timing and relevance of maternal health messages shared through digital platforms is likely to influence behavioural change in pregnant women to complete the continuum of care. In this way, the risks and complications associated with pregnancy are managed towards reducing the high records of maternal mortality.

<p>A digitalized program to improve antenatal health care in a rural setting in North-Western Burundi: early evidence-based lessons [7]</p>	<p>To design and test a digital intervention as well as to understand the perceptions of mothers and pregnant women</p>	<p>North-Western Region, Burundi</p>	<p>Quantitative research – Cross-sectional survey</p>	<p>Mobile platform for maternal Health to manage ANC appointments and service utilization.</p>	<p>The use of digital intervention influenced the increase in ANC visits. The lack of mobile device ownership had a negative impact on the acceptability of the intervention.</p>	<p>Digital maternal health promotion requires pregnant women living in rural settings to own internet-enabled devices at affordable costs. These devices support interventions to detect early warning signs of pregnancy-related complications and the appropriate response through collaborative networks with CHWs.</p>
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