Original Research Article

Influence of male targeted short message service on uptake of family planning among spouses in Marsabit County, Kenya

Vincent O. Matoke[1,2]*, Eliphas M. Gitonga[1], Isaac O. Owaka[3], Geoffrey M. Okari[4], Michel Mutabazi[5]

[1]Department of Environmental and Occupational Health, School of Health Sciences, Kenyatta University
[2]Department of Community Health and Development, Faculty of Science, The Catholic University of Eastern Africa
[3]Department of Family Medicine, Community Health and Epidemiology, School of Health Sciences, Kenyatta University
[4]Department of Health Management and Informatics, School of Health Sciences, Kenyatta University
[5]Department of Health Systems Management and Development, School of Public Health, Amref International University

*Correspondence:
Dr. Vincent O. Matoke,
E-mail: omwengavincent96@yahoo.com

ABSTRACT

Background: Family planning helps in regulating the number of children and determine healthy spacing and timing of births between pregnancies. The global contraceptive prevalence stands at 49.0%, Sub-Saharan Africa at 29.0%, Kenya at 56.9% while in Marsabit County at 5.6%. Male spouse involvement on matters of family planning deserves attention. This study aimed at establishing the influence of male targeted short message service on uptake of family planning among female spouses in Marsabit County, Kenya.

Methods: A pre-test and post-test quasi experimental study design was adopted involving randomly selected 220 couples from Laisamis and Moyale sub-counties. Intervention of male targeted short message service was offered to male spouses from Moyale sub-county for a period of 4 months. A questionnaire was used to collect data. Quantitative data analysis was done using SPSS. All the required ethical and logistical considerations followed.

Results: At baseline level of uptake was overall 14.3%, control 13.2% and intervention 15.4% while at endline overall 30.2%, control 20.4% and intervention 39.5%. Further results revealed that uptake of family planning was increased by use of short message service.

Conclusions: The study concluded that the level of uptake was low but with SMS intervention uptake significantly increased. The Ministry of Health should consider integrating male targeted short message service intervention in provision of family planning services to increase uptake.

Keywords: Family planning, Male targeted short message service, Spouse, Uptake

INTRODUCTION

Family planning (FP) refers to a deliberate effort which allow people to regulate the number of children and determine healthy spacing and timing of births between pregnancies.[1] This is achieved through use of different contraceptive commodities to prevent unwanted or unplanned pregnancies. There are a number of direct and indirect benefits attributable to family planning uptake including the reduction in the spread of HIV to newborn babies; reduction of maternal mortality and morbidity; reduction in neonatal, infant and child mortality; reduction recourse to often unsafe abortion as well as improvement in education and employment opportunities

for women who are able to delay initiation of childbearing. Sustainable development goal (SDG) number 3 target 3.7 has prioritized universal access to sexual and reproductive care, family planning and education.[2]

Globally, approximately 190 million women of reproductive age do not use any method of family planning despite being sterile, up from 156 million in 2000. The percentage of women who lack access to family planning has remained unaltered since 2000 at 10%.[3] The global contraceptive prevalence stands at 49.0% with Sub-Saharan Africa accounting for the lowest at 29.0%.[4] In Kenya the modern contraceptive prevalence rate stands at 56.9% while in Marsabit County stands at 5.6% with a 37.6% un met need for family planning.[5] The low contraception rate could be attributed to several factors including lack of information, cultural beliefs and practices, myths and misconceptions, commodity accessibility, limited choice of commodities and limited staff skills.[6]

Low uptake of family planning has been associated with high maternal mortality rates across the world. In Kenya, the rate of maternal mortality stands at 342/100,000 which is high than WHO target of 147/100,000 live births.[7] Marsabit County is among the top-five counties with high burden of maternal mortality currently standing at 1,127 per 100,000 live births.[5] Low contraceptive prevalence has also been associated with increased neonatal, infant and child mortality; increased cases of unsafe abortion as well as reduced opportunities for education and employment for women who are unable to delay initiation of childbearing.[8]

There is notable great progress on family planning uptake over the years.[9] However, research findings have shown that many women worldwide would want to prevent pregnancy but they and their partners are not using contraceptives and some of the reasons for this unmet need are quality of service, unavailability of range of methods, fear of opposition from partners and worries of side effects and health concerns among others. Male spouses' involvement on matters of family planning deserves attention since men can influence their spouses to use or not use any family planning method.[10]

Male involvement not only means use of condoms and seeking vasectomy but also encouraging and supporting their spouses in natters of contraception and encouraging their peers to use family planning. Male involvement also can influence the policy environment to be more conducive to developing male-related programmes.[11] Male spouses can be involved through providing culturally friendly health education with child spacing messages rather than family planning itself since maybe having a negative attitude towards the contraceptive commodities. The health education messages through SMS should include benefits of family planning, methods of family planning, risks and side effects, access and availability as well as myths and misconceptions. Such messages are absolutely necessarily in improving their beliefs and attitudes towards contraception. In fact, research findings have shown that the most effective health education is the one designed in a manner that it demonstrated how their families can develop socially and economically though spacing or controlling the number of children.[12] Thus, involving men will have a significant role in overall uptake of family planning by increasing their availability, accommodation and acceptability.[13] Additionally, those family planning centers should be made more attractive to male partners.[14] Therefore, the objective of this study was to establish the influence of male targeted short message service on uptake of family planning among spouses in Marsabit County, Kenya.

METHODS

Design

The study utilized a pretest-post-test quasi experimental study design to determine the influence of male targeted SMS intervention on family planning uptake among couples. The study design was preferred because it's ideal in showing cause and effect through manipulation of variables without randomization. Questionnaires were used to collect data at baseline (pre-intervention) and end line (post-intervention) from both spouses.

Intervention

The intervention for this study involved four months male targeted short message service on family planning. The respondents in the intervention group received one message per week for the sixteen weeks from November, 2023 to end of February, 2024 while those who were in the control group did not receive messages. The sixteen weeks were more than the ideal period to influence change as documented by different researchers. The key messages included: meaning of family planning, eligibility, methods of family planning, benefits, and common side effects of family planning among others. Both the intervention group and the control group were again evaluated two months following the completion of the intervention. Five months was enough to check the effect of SMS intervention uptake of family planning.[15]

Study location

The study was carried out at Marsabit Count, located to the northern peak of Kenya, sharing more than 500 km of boarder with Ethiopia to the North and North East, Wajir County to the East, Isiolo County to the South East, Samburu County to the south and south west and lake Turkana to the West and North West. Marsabit County is among the counties with low contraceptive prevalence and high total fertility rate. The county has a population of 459, 949 with 243,548 (53% male and 216, 21947% female covering 70,944 sq. km.[16] The county has four sub-counties namely; North Horr, Laisamis, Saku and

Moyale. Moyale and Laisamis sub-counties were purposively selected for the study. The two sub-counties in question were chosen since it was simpler to regulate the contaminating impact of the intervention since the two sub counties are far apart, with Saku and North Horr sub-counties separating them. Moyale sub-county had 7 wards (30 community Health units) while Laisamis sub-county had 5 wards (25 community health units). Two wards from each sub county were selected for the study. Butiye and Sololo were selected from Moyale sub-county while Logologo and Laisamis wards were selected from Laisamis sub-county.

Inclusion and exclusion criteria

The study included couples who consented to participate in the baseline and evaluation survey. In case of polygamy only one wife was randomly selected for the study. The couples' mere permanent residents of the specified sub counties with no plans to relocate within two years. The study also included couples whose female partners were within the reproductive age (15-49 years). Additionally, the male partners should have owned or had access to mobile phone and resided in areas whereby there was network coverage. However, the study excluded male spouses whose spouse were pregnant during recruitment.

Sampling

Marsabit County was purposively selected because of was among the bottom three counties with the lowest modern contraceptive uptake and the highest rate of unmet needs of family planning. Two stage sampling method was used to recruit participants to be involved. The first stage of sampling involved the purposive sampling to select the sub counties while the second stage of sampling was done to select the community health units (CHUs) randomly and systematically to select the house holds from which the study participants were selected. Thus, in the first stage, two sub counties (Moyale and Laisamis sub counties) were purposively chosen since they were far away from each other thus reducing the chances of cross-social interactions and transfer that might lead to knowledge contamination. Two wards from each sub-county were randomly selected (Butiye and Sololo wards from Moyale while from Laisamis Logologo and Laisamis wards). The second step was selection of community health units from where the households were picked. Each community health unit (CHU) comprised of approximately 1000 households.[16] A total of four community health units were randomly selected for the study. Kamboe and Merille CHUs from Logologo and Laisamis wards in Laisamis sub-county while Butiye and Sololo Makutano from Butiye and Sololo wards from Moyale sub-county were randomly selected. The households from the community health units were selected via systematic random sampling using a sample frame consisting of a list of households given by community health assistants/officers/promoters. The

researcher and research assistants with the help of community health promoters (CHPs) were then move from home to home systematically recruiting people who met the inclusion criteria until the sample size was attained. If a household had eligible participants, they were chosen to participate.

Sample size determination and distribution

A formula was applied in calculating the sample size for comparison of two proportions (two-sided) at 5% level of significance and 80% power.[17] In Marsabit County the modern contraceptive prevalence rate stands at 5.6%. If, as stated in response to their post-partum care seeking behavior and uptake of family planning of mothers in peri-urban public facilities in Kenya, the percentage of family planning uptake was 44.8%, then after the intervention of short message service (SMS) the family planning uptake increased to 57.5%.[15] As a result, the available effect size was 12.7%. Thus, using the modern contraceptive prevalence of 5.6% the effect size of 12.7% then the projected increase in Modern contraceptive prevalence rate is 18.3%.[5] Then, the following formula for sample size was used in calculation:

$$M = \frac{C\{\pi1\,(1-\pi1)\,+\,\pi2(1-\pi2)\}}{(\pi1-\pi2)^2}$$

Where:

M = sample size required in each group

C = 7.9, a ratio from a square of the sum of Z score of 80% power (0.842) and 5% significance (1.96). That is $(1.96 + 0.842)^2 = 7.9$.

$\pi1$=first proportion= 0.056, $\pi2$=second proportion=0.183

$\pi1 - \pi2$=size difference of clinical importance for this study= 0.127.

Therefore:

$$M = \frac{7.9\{0.056(1-0.056)\,+\,0.183(1-0.183)\}}{(0.056-0.183)^2}$$

$$= \frac{7.9\{0.056(0.944)\,+\,0.183(0.817\}}{(0.127)^2}$$

$$= \frac{7.9\{(0.052864\,+\,0.149511)\}}{(0.016129)}$$

$$= \frac{7.9\{0.202375\}}{(0.016129)}$$

= 99.1 which was approximately 100.

Thus, at least 100 participants were recruited plus a 20% to cover for loss to follow up. Hence the total number of respondents per arm were 100+20=120 couples. In total,

240 couples were enrolled into control and intervention arms.

Research instruments

Semi-structured questionnaires were utilized in collection of quantitative data. The study had two sets of questionnaires; baseline data questionnaire and exit interview questionnaire for both groups. The pre-test was done at Saku sub-county in Marsabit County. A total of 24 of couples were picked for pretesting of questionnaires

Data management and analysis

The baseline and evaluation data were cleaned, entered and managed in the SPSS software version 22.0. Family planning was dichotomized into uptake and non-uptake of family planning. Uptake was determined by those who were using a modern family planning method while non-uptake was those who were not be using any modern family planning method. To determine the effectiveness of intervention, logistic regression analysis was used to determine if changes in uptake of family planning between control and intervention groups were significant at evaluation.[18]

Logistical and ethical considerations

The researcher obtained approval and authorization from Kenyatta University graduate school. Ethical permit was sought from Kenyatta University Ethics and Review Committee. Further research permit to conduct the research were sought from National commission for Science, Technology and innovation (NACOSTI). Permission to carry out the study was also sought from Marsabit County and local leadership. Respondents were required to sign a written consent before being interviewed. Privacy and confidentiality of information obtained was assured.

RESULTS

Uptake of modern family planning

Figure 1 shows level of uptake of family planning at baseline and endline. Results showed that overall uptake increased from 33 (14.3%) at baseline to 67 (30.2%) at endline. Uptake of family planning also increased from 15 (13.2%) to 22 (20.4%) in control and 18 (15.4%) to 45 (39.5%) in the intervention at baseline and endline surveys respectively.
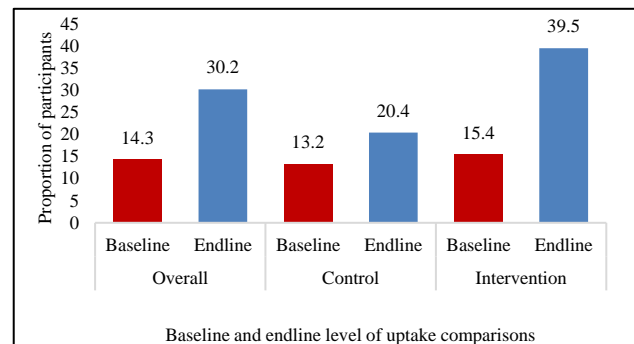

Figure 1: Level of uptake of family planning at baseline and endline.

Method of family planning used

Table 1 presents results on the methods of family planning used by the respondents. At baseline for combined contraceptive injection was common at 8 (24.2%) while at endline condom use was common at 16 (23.9%). Among the respondents in the control group, at baseline contraceptive injection and oral contraceptive pills were common at 4 (26.7%) for both while at endline survey contraceptive implant became common at 6 (27.3%). In the intervention group, at baseline lactational amenorrhea 5 (27.8%) and at endline condom use 12 (26.7%) were common. Preference for short acting family planning methods was also noted by the key informants.

Main reason for non-uptake

Table 2 shows the main reasons for non-uptake of family planning. Combined data showed that opposition by husband 62 (32.1%) and individual unwillingness 77 (50.7%) were the main reasons for non-uptake at baseline and endline surveys respectively. In control group, opposition by husband 37 (38.1%) and individual unwillingness 28 (33.3%) were the reasons at baseline and endline respectively. In intervention group, individual unwillingness was the main reason 27 (28.1%) and 49 (72.1%) at both baseline and endline surveys respectively.

Table 1: Method of family planning used.

Method of FP used	Overall (%)		Control (%)		Intervention (%)	
	Baseline	Endline	Baseline	Endline	Baseline	Endline
Oral contraceptive pills	5 (15.2)	10 (14.9)	4 (26.7)	2 (9.1)	1 (5.6)	8 (17.8)
Intra-uterine device (IUD)	3 (9.1)	10 (14.9)	1 (6.7)	1 (4.5)	2 (11.1)	9 (20.0)
Lactational amenorrhea	6 (18.2)	5 (7.5)	1 (6.7)	5 (22.7)	5 (27.8)	0 (0.0)
Contraceptive injection	8 (24.2)	12 (17.9)	4 (26.7)	4 (18.2)	4 (22.2)	8 (17.8)
Contraceptive implant	4 (12.1)	14 (20.9)	2 (13.3)	6 (27.3)	2 (11.1)	8 (17.8)
Condoms	7 (21.2)	16 (23.9)	3 (20.0)	4 (18.2)	4 (22.2)	12 (26.7)

Table 2: Main reason for not using family planning method.

Main reason for not using FP	Overall (%)		Control (%)		Intervention (%)	
	Baseline	Endline	Baseline	Endline	Baseline	Endline
Fear of side effects	29 (15.0)	26 (17.1)	11 (11.3)	23 (27.4)	18 (18.8)	3 (4.4)
Opposition by husband	62 (32.1)	27 (17.8)	37 (38.1)	23 (27.4)	25 (26.0)	4 (5.9)
Religious or cultural reasons	26 (13.5)	10 (6.6)	14 (14.4)	4 (4.8)	12 (12.5)	6 (8.8)
Access and cost	6 (3.1)	5 (3.3)	1 (1.0)	2 (2.4)	5 (5.2)	3 (4.4)
Provider related	6 (3.1)	4 (2.6)	2 (2.1)	1 (1.2)	4 (4.2)	3 (4.4)
Individual unwillingness	55 (28.5)	77 (50.7)	28 (28.9)	28 (33.3)	27 (28.1)	49 (72.1)
Opposition by other family members	9 (4.7)	3 (2.0)	4 (4.1)	3 (3.6)	5 (5.2)	0 (0.0)

Table 3: Influence of short message service on uptake on family planning.

Group	Type of survey	Uptake of family planning		Statistical significance
		Uptake (%)	Non-uptake (%)	
Overall	Baseline (n=231)	33 (33)	198 (56.1)	χ^2=16.626 df=1, p=0.001
	Endline (n=222)	67 (67)	155 (43.9)	
Control	Baseline (n=114)	15 (40.5)	99 (53.5)	χ^2=2.077 df=1, p=0.150
	Endline (n=108)	22 (59.5)	86 (46.5)	
Intervention	Baseline (n=117)	18 (28.6)	99 (58.9)	χ^2=16.892 df=1, p=0.001
	Endline (n=114)	45 (71.4)	69 (41.1)	

Influence of short message service on uptake of family planning (logistic regression)						
Variable	Uptake of FP (%)	Non-uptake of FP (%)	Odds ratio (OR)	P value	Confidence interval (CI)	
Baseline (reference)	33 (33)	198 (56.1)	2.5935	p=0.001	1.6261	4.1366
Endline	67 (67)	155 (43.9)				
No male targeted SMS (reference)	18 (28.6)	99 (58.9)	3.5870	P=0.001	1.9159	6.7155
Male targeted SMS	45 (71.4)	69 (41.1)				

Influence of short message service on uptake of family planning

Table 3 shows the association and influence of short message on uptake of family planning. There was highly significant association between type of survey and uptake of family planning for the combined data (χ^2=16.626, p=0.001). There was also a significant association between male targeted short message and uptake of family planning for the intervention arm (χ^2=16.892, p=0.001). Logistic regression analysis revealed that uptake of family planning was increased by 2.6 times at endline for combined data (OR 2.6, p<0.001 CI: 1.6261-4.1366). Uptake of family planning was increased by 3.6 times though use of short message service (OR 3.6, p<0.001 CI: 1.9159-6.7155).

DISCUSSION

The results showed that male targeted short message service intervention increased significantly the uptake of family planning. In fact, the increase in the intervention group was more than twice reflecting a large effect size. This means that without the SMS intervention the uptake is very low. There was also a significant statistical association between receiving SMS and uptake of family planning. Logistic regression analysis revealed that SMS

intervention was a predictor for family planning uptake as the odds of using increased. Sharing health information can help overcome some of the barriers to family planning uptake and increase awareness and use of available options.[19] Such SMS programs can be tailored to specific settings, needs, and preferences, and help foster trust and engagement among individuals and communities.[20] SMS interventions can be applied to men alone or together with their partners.[21]

A study on SMS intervention in informal settlements in Kenya revealed that uptake of maternal services like family planning increased.[22] The results agreed with another which revealed that text reminders increased use of family planning in Mozambique.[23] Another study on effect of mobile phone messaging on uptake of maternal and child health service revealed that the intervention increased uptake of family planning significantly.[24] In Tanzania, use of interactive voice response increased uptake of family planning.[25] A study on addressing barriers to accessing family planning services using mobile technology intervention revealed that male spouse increased knowledge, changed their attitude and thus became more involved increasing uptake.[26]

The common method of family planning were oral contraceptive pills and lactational amenorrhea for control

and intervention arms respectively at baseline. This means that majority of those who were using family planning preferred short acting methods. This may be attributed to the fact that they prefer child spacing rather than limiting since still there is preference of many children.[27] These findings agreed with a study on determinants of modern contraceptive discontinuation which revealed that women preferred short acting family planning options.[28] The results were contrary to a study on demand for family planning in rural areas which revealed that the common family planning method was intrauterine device (IUDs).[29] The difference could be due to the cultural beliefs whereby in Marsabit they prefer family planning services for spacing not to reduce number of children hence preference for short acting family planning methods.

Further results showed that individual unwillingness was the main reason for non-uptake in the control and intervention arms at baseline. This may be attributed to the fact that many efforts have been put in place to increase uptake of family planning but individuals still are unwilling to use because of other reasons which might be personal or societal. The results agree with another one which reported that the main reason for low contraceptive prevalence was unwillingness to use family.[30] The study was contrary to other findings that showed that financial challenges remained a main reson.[31] This could be due to differences fact that in Marsabit County there several organization intervening on family planning and the services are given free of charge as compared to other places.

The study encountered challenges of inaccessibility of some places due to poor road network in Marsabit County. This necessitated the data collection exercise to take longer than anticipated. In the county also there was a problem of language barrier which necessitated translation of data collection tools and messages sent to intervention group. The study was also limited to Moyale and Laisamis sub-counties

CONCLUSION

Male targeted short message service significantly increased uptake of family planning from 15.4% to 39.5% in intervention group. The changes were largely in the intervention group where male targeted short message service predicted uptake of family planning (OR=3.59. p=0.001). Therefore, the study concludes that short message intervention can help in enhancing knowledge hence improve uptake of family planning. Thus, the policy makers should develop guidelines on short message services and disseminate them in an appropriate language and period to both spouses to a larger impact.

ACKNOWLEDGEMENTS

REFERENCES

1. WHO, Maternal mortality. WHO, 2018. Available from: https://www.who.int/news-room/fact-sheets/detail/maternal-mortality/?gad_source=1andgclid=Cj0KCQjw7ZO0BhDYARIsAFttkChCb8apstI5tM6ewPkJyA6gC6qqJx1HemmARjKrju4QzUl0BknDF-gaAinsEALw_wcB. Accessed on 2 June 2024.
2. UNDP. Sustainable development goals (SDGs). UNDP, NY; 2015.
3. Family Planning and the 2030 Agenda for Sustainable Development (Data Booklet). United Nations; 2019.
4. United Nations Department of Economic and Social Affairs, World Family Planning 2020: Highlights: Accelerating Action to Ensure Universal Access to Family Planning. United Nations; 2020.
5. Kenya National Bureau of statistics KNBS, Kenya Demographic and health Survey 2022. KNBS, 2022. Available from: https://dhsprogram.com/pubs/pdf/PR143/PR143.pdf. Accessed on 2 June 2024.
6. Ahmed S, Choi Y, Rimon JG, Alzouma S, Gichangi P, Guiella G, et al. Trends in contraceptive prevalence rates in sub-Saharan Africa since the 2012 London Summit on Family Planning: results from repeated cross-sectional surveys. Lancet Glob Health. 2019;7(7):e904-11.
7. NCPD, UNFPA, Kenya Population Situational Analysis. National Council for Population and Development; 2015.
8. Diamond-Smith N, Warnock R, Sudhinaraset M. Interventions to improve the person-centered quality of family planning services: a narrative review. Reprod Health. 2018;15:1-7.
9. World Health Organization. Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division: executive summary. World Health Organization. Available from: https://iris.who.int/handle/10665/327596. Accessed on 2 June 2024.
10. de Vargas Nunes Coll C, Ewerling F, Hellwig F, De Barros AJ. Contraception in adolescence: the influence of parity and marital status on contraceptive use in 73 low-and middle-income countries. Reprod Health. 2019;16:1-2.

11. Solo J, Festin M. Provider bias in family planning services: a review of its meaning and manifestations. Glob Health Sci Pract. 2019;7(3):371-85.

12. Kriel Y, Milford C, Cordero J, Suleman F, Beksinska M, Steyn P, et al. Male partner influence on family planning and contraceptive use: perspectives from community members and healthcare providers in KwaZulu-Natal, South Africa. Reprod Health. 2019;16(1):1-5.

13. Muttreja P, Singh S. Family planning in India: the way forward. Indian J Med Res. 2018;148(Suppl 1):S1-9.

14. Kibira SP, Karp C, Wood SN, Desta S, Galadanci H, Makumbi FE, et al. Covert use of contraception in three sub-Saharan African countries: a qualitative exploration of motivations and challenges. BMC public health. 2020;20(1):865.

15. Jones RM, Kimenju G, Subbiah S, Styles A, Pearson N, Rajasekharan S. A short message service (SMS) increases postpartum care-seeking behavior and uptake of family planning of mothers in peri-urban public facilities in Kenya. PLoS One. 2020;15(9):e0239213.

16. Kenya National Bureau of Statistics, Ed., 2019 Kenya population and housing census. Nairobi: Kenya National Bureau of Statistics; 2019.

17. V.I. Gavrilov. Acta Virol. 1975;19(6):510.

18. Stratton SJ. Quasi-experimental design (pre-test and post-test studies) in prehospital and disaster research. Prehosp Disast Med. 2019;34(6):573-4.

19. Bhatt N, Bhatt B, Neupane B, Karki A, Bhatta T, Thapa J, et al. Perceptions of family planning services and its key barriers among adolescents and young people in Eastern Nepal: a qualitative study. PloS One. 2021;16(5):e0252184.

20. Blackwell S, Louis JM, Norton ME, Lappen JR, Pettker CM, Kaimal A, et al. Reproductive services for women at high risk for maternal mortality: a report of the workshop of the Society for Maternal-Fetal Medicine, the American College of Obstetricians and Gynecologists, the Fellowship in Family Planning, and the Society of Family Planning. Am J Obstet Gynecol. 2020;222(4):B2-18.

21. Ladur AN, van Teijlingen E, Hundley V. Male involvement in promotion of safe motherhood in low-and middle-income countries: a scoping review. Midwifery. 2021;103:103089.

22. Ochieng' S, Hariharan N, Abuya T, Okondo C, Ndwiga C, Warren CE, et al. Exploring the implementation of an SMS-based digital health tool on maternal and infant health in informal settlements. BMC Pregnancy Childbirth. 2024;24(1):222.

23. Leight J, Hensly C, Chissano M, Safran E, Ali L, Dustan D, et al. The effects of text reminders on the use of family planning services: evidence from a randomised controlled trial in urban Mozambique. BMJ Glob Health. 2022;7(4):e007862.

24. Gilano G, Dekker A, Fijten R. Effect of mobile phone messaging on uptake of maternal and child health service in southern Ethiopia: Protocol for cluster randomized controlled trial. Clin Nutr Open Sci. 2024;54:89-99.

25. Ngowi K, Msoka P, Mtesha B, Kwayu J, Mappi T, Kiwango K, et al. "The phone number tells us good things we didn't know before." Use of interactive voice response calling for improving knowledge and uptake of family planning methods among Maasai in Tanzania. PLOS Dig Health. 2023;2(5):e0000254.

26. Sampson S, Oni F, Ayodeji O, Oluwatola T, Gab-Deedam S, Adenipekun O, et al. Addressing barriers to accessing family planning services using mobile technology intervention among internally displaced persons in Abuja, Nigeria. AJOG Glob Rep. 2023;3(3):100250.

27. Gitonga E, Gage AJ. Modern contraceptive prevalence and its predictors among non-refugee and refugee Somali women in Nairobi city, Kenya; a comparative view. Front Glob Women's Health. 2024;5:1328612.

28. Ontiri S, Were V, Kabue M, Biesma-Blanco R, Stekelenburg J. Patterns and determinants of modern contraceptive discontinuation among women of reproductive age: Analysis of Kenya Demographic Health Surveys, 2003-2014. PloS One. 2020;15(11):e0241605.

29. Komasawa M, Yuasa M, Shirayama Y, Sato M, Komasawa Y, Alouri M. Demand for family planning satisfied with modern methods and its associated factors among married women of reproductive age in rural Jordan: a cross-sectional study. PloS One. 2020;15(3):e0230421.

30. Logan RG, Daley EM, Vamos CA, Louis-Jacques A, Marhefka SL. "When is health care actually going to be care?" The lived experience of family planning care among young black women. Qual Health Res. 2021;31(6):1169-82.

31. Bekele D, Surur F, Nigatu B, Teklu A, Getinet T, Kassa M, et al. Contraceptive prevalence rate and associated factors among reproductive age women in four emerging regions of Ethiopia: a mixed method study. Contracept Reprod Med. 2021;6(1):18.