Impact of *m* Health to Improve Postnatal Visits among Postpartum Mothers in a Rural Community in Kakamega County, Kenya

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Abstract

Background: There is an increase of mobile phone use globally with Kenya being among countries with increased usage both in rural and urban areas. Despite the widespread use of mobile phone, its use in health delivery services such as enhancing postnatal clinic (PNC) attendance is quite low. Countries such Kenya are exploring various interventions such as use of *m* health to improve the uptake of postnatal care. Postnatal visits have been reported in many studies to be low in many countries, and this has eventually affected the utilization of postnatal services. During the postnatal period the health care providers get opportunity to detect maternal and neonatal health problems in order to curb morbidities and mortalities.

Objective: This study aimed to determine the effect of mobile phone in enhancing postnatal visits among postnatal mothers in Kakamega County, Kenya

Methods: This was an experimental longitudinal and a facility based randomized control trial with a quantitative data. It was carried among 284 eligible postnatal mothers. Systematic sampling technique was used to recruit the study subjects. Data was analysed using SPSS version 21.

Results: There was a significant increase in attendance between control arm and intervention arm 3 (combination of SMS and voice call) by 40% in second PN, third 14% and 23% in fourth postnatal visit. There was a significant difference in adherence to second and third postnatal visit between control and intervention arms. We concluded that combination of voice call and SMS is 3.37 times more effective than voice call or SMS alone. The Kakamega County government should integrate use of mobile phone in delivery of health care services.

Key words*: m Health;Mobile phone technology; Maternal; postnatal mother;postnatal visits.*

Background to the Study

Postnatal period is the period starting from one hour after the placenta delivery and extends six months that follow.[1] During this period the mothers are expected to visit postnatal clinic to be offered postnatal services that are essential to the mother and the baby. Such visits provide the health worker with an opportunity to assess the mother and the baby and detect health problems early and offer appropriate interventions[2] with a goal to prevent morbidities and mortalities. Approximately 53% of mothers in Kenya attend postnatal clinic within two days after delivery whereas 34% do so in Kakamega County which is one of the counties with low attendance.

Studies suggest that improving postnatal services may increase the uptake of postnatal services and eventually prevent the maternal and neonatal deaths[3]. About 75% of neonatal deaths occur during the first week of life with majority of these deaths being found in developing countries[4]. About 300,000 maternal deaths occur within the first week after delivery and majority of them happen also in the developing countries[5]. Reducing

maternal and neonatal mortalities is of significant importance. In Kenya maternal mortality is at 362 per 100,000 live births with a neonatal mortality of 22 per 1000[6].

Mobile phone has a potential of transforming the health care sector such as postnatal clinic attendance[7]. Mobile telephone technology is one of the fastest channels of communication. World Health Organization[8] approximates about one hundred countries are experimenting mobile phone to improve the health indicators. There is an increasing popularity of mobile phone technology in passing health messages[9]. Mobile phone technology has attracted a lot of attention amongst the medical professionals just to evaluate whether it's use can improve appointment compliance [10] and health indicators of community members. Many studies have explored various strategies to improve maternal health and postnatal care. Chelagat*et al*. [11] proposed six strategies to improve maternal health especially postnatal care among them follow up care and coordinated postnatal care.

Materials and Methods

This was a facility based randomized control trial, a true experimental study, carried out in Kakamega County, Kenya. It was aimed to explore the effect of mobile phone in enhancing postnatal visits among the postnatal mothers in Kakamega County. The study sites included four selected sub county hospitals: Butere (control arm), Shibwe (arm 1-received voice calls), Malava (arm 2-received SMS), Navokholo (arm 3-received combination of SMS and voice call) where a study population of 284 postnatal mothers were recruited using systematic sampling. Two mobile phone reminders were sent 48 hours and 24 hours prior to the postnatal visit. We collected data using questionnaires from January to September 2020 with assistance of two trained research assistants in each study site. Adherence to second and third postnatal visit was dichotomized into adherence and non- adherence. Adherence was consistent attendance of both second and third PN clinic. Pretesting of the tools was done at Manyala Sub County hospital. Data was checked for accuracy and completeness and analysed using SPSS version 21. Chi-square was used to determine the significance of association where p-value was set at 0.05. Binary logistic regression was run to determine odds ratio. The study had been reviewed and cleared by Kenyatta University Ethical Committee. Informed consent was sought from all the study participants, privacy and confidentiality upheld throughout.

Results

Baseline and end line postnatal visits among study participants

Table 1 shows a summary of baseline and end line postnatal attendance by the study participants. In the baseline majority (29%) of participants attended second postnatal clinic in arm 2 with a low attendance (19%) reported in control arm. After sending reminders, majority of the participants (62%) from intervention arm 3 attended second postnatal visit whereas 53% of them from intervention 1, and only 25% in control arm visited. There was a significant difference in postnatal visits between control and intervention arms [(second postnatal visit (p=0.001), third postnatal visit (p=0.012) and forth postnatal visit (p=0.007)]. After running binary logistic regression postnatal visits increased 3.16 times after the voice call, 2.67 times upon sending SMS and 3.37 times after sending combination of SMS with voice calls.

Table 1 Baseline and end line postnatal visits

Postnatal visits	Control arm Frequency/%	Arm 1 Frequency/%	Arm 2 Frequency/%	Arm 3 Frequency/%	Totals	Significance
Baseline	n=80	n=80	n=80	n=80		
End line	n=67	n=72	n=71	n=74		

Cont... **Table 1 Baseline and end line postnatal visits**

2ND	Baseline	19(24%)	22(26%)	23(29%)	20(25%)	84(26%)	
	End line	18(25%)	38(53%)	34(48%)	46(62%)	136(47%)	p=0.001
3RD	Baseline	55(69%)	54(68%)	49(61%)	51(64%)	209(65%)	
	End line	48(67%)	56(78%)	54(76%)	61(82%)	214(74%)	p=0.012
4TH	Base line	10(13%)	5(6%)	6(8%)	9(11%)	30(9%)	
	End line	11(16%)	25(35%)	22(31%)	28(38%)	86(30%)	p=0.107

Baseline and end line adherence to second and third postnatal visit

Table 2 shows baseline and end line adherence to second and third postnatal visit. In the baseline participants (32%) adhered to second and third postnatal visit in arm 2 whereas after sending reminders 62% adhered in arm 3 with only 18% in control arm. There was a significant difference in adherence between control and intervention arms after sending the reminders (p=0.000).

Table 2: Baseline and end line adherence to second and third postnatal visit.

Adherence	Control Frequency/%	Arm 1 Frequency/%	Arm 2 Frequency/%	Arm 3 Frequency/%	Total	significance
Baseline	n=80	n=80	n=80	n=80		
End line	n=67	n=72	n=71	n=74		
Base line	17(21%)	21(26%)	26(32%)	23(29%)	87(27%)	
End line	12(18%)	32(56%)	36(49%)	28(62%)	133(47%)	p=0.000

Discussion

The study revealed mobile telephone reminders increased the postnatal visits. The postnatal mothers were being accessed using reminders in the homes just as Opuku[12] observed in his work. A higher attendance was observed in the intervention arm 3 because this arm had advantage of receiving both SMS and voice call reminders. Sending two reminders to the participants prior to the postnatal visit could have motivated them to adhere to the postnatal visits. This eventually increased the attendance and consequently utilization of postnatal services. It was noted that 47% of the postnatal mothers adhered to second and third postnatal visit. This is contrary to a study by Kikuchi *et al.*[3] in Combodia who observed only 5% of women completed the continuum of care. Lower adherence rate indicates the health workers are not able detect maternal and neonatal health problems early enough and make necessary interventions. However, this study may imply that for participants who adhered to second and third postnatal it was a good opportunity for them to prevent and be

treated for maternal and neonatal health problems. This study agrees with a study done in South Africa by Mokaya[13] that reported increased postnatal attendance after SMS and voice call reminders. Intervention arm 1 (voice call) had higher proportions than the intervention arm 2 (SMS) in all postnatal visits and even in adherence to second and third postnatal visit. This agrees with Bangal*et al.*[14] who found voice calls to be more effective than SMS. However, this study disagrees with Car (2012) who had indicated that SMS improved attendance more than voice calls. Studies done in Kenya[15] and another one in Tanzania [16] indicated significant rise in attendance among mothers who received SMS. The effect of voice call could be due to the possibility that through voice calls there was direct interaction with the participant as opposed to SMS where it was uncertain to confirm immediately whether the recipient read the SMS and understood it.

Conclusion

Combination of voice calls and SMS increased the postnatal visit 3.37 times whereas voice call increased by 3.16 and SMS by 2.67 times. There was a significant increase of postnatal clinic attendance in the second, third postnatal visit and forth postnatal visit between the control and intervention arms.

Recommendation

Kakamega County government should integrate the use of mobile phone technology in the delivery of postnatal services. This may help improve the low attendance and help in achieving Sustainable Development Goal 3 (SDG3).

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Ethical Clearance: This study was cleared by Kenyatta University Ethical Committee.

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