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Influence of organizational and access factors on adherence to appointments in antenatal clinics in Homa Bay and Kisumu County Referral Hospitals, Kenya

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Abstract

Introduction: *the world wastes about 40% of health resources, and African medical setting has about 42% missed appointment rate. Kenya has 44% missed appointment rate in antenatal clinics, wasting about 22% of health resources. Five hundred and two thousand eight hundred and sixty (502,860) children were not immunized in 2017. Homabay and Kisumu Counties with 91/1000 and 149/1000 under-five mortality rates, recorded 42% and 35% missed appointment rates in antenatal clinics respectively in 2019. This study assessed influence of organizational and access factors on adherence to appointments in antenatal clinics.* ***Methods:*** *the study adopted cross-sectional research design across two hospitals, purposively sampled (Homabay and Kisumu County Hospitals) because of high under-five mortality and high HIV prevalence rates. Stratified and proportionate sampling were used to sample patients, and purposive sampling for hospital managers. Yamane Formula was used to determine sample size. The study comprised 133 antenatal patients (Homabay County Hospital 70, Kisumu County Hospital 63) and two hospital managers per hospital. Self-administered structured questionnaire and key informant interview were used to collect data.* ***Results:*** *study revealed in Homabay and Kisumu County hospitals respectively, as follows: 55 (78.6%) and 35 (70%) antenatal clients missed their appointments because of waiting time; 55 (78.6%) and 30 (60%) due to facility operating hours; and 55 (78.6%) and 25 (50%) due to opportunity cost of seeking services; and 55 (78.6%) and 20 (40%) due to facility proximity.* ***Conclusion:*** *there is high missed appointment rates in antenatal clinics in Homabay and Kisumu County hospitals because of poor organization of antenatal services, opportunity cost and facility location.*

Introduction

The world wastes up to 40% of health care resources according to [1], and 56% of these wasted resources are attributed to missed appointments. Missed appointments cost the United States and National Health Service up to $150 billion and £912 million annually respectively in 2015 [1,2] place missed appointments in African medical setting at about 42%. In Kenya [3] cited that 22% of health resources are wasted because of missed appointments [4] cite that Kenya has about 44% missed appointment rate in Antenatal care (ANC) clinics caused by health facility practices and access factors. This missed appointment rate has stagnated ANC coverage at 58% in Kenya. According to [5], under one-year old children receiving all vaccines declined from 78% to 54.8%, and women accessing at least 4 ANC visits from 37.8% to 28.3% in 2016 and 2017 respectively. Another 502,860 children were not immunized in 2017.

ANC coverage in Kisumu and Homabay counties are 68% and 61% with 149/1000 and 91/1000 under-five mortality respectively [6]. This means that there are still a large percentage of children not receiving ANC despite the efforts to avail the services at no cost, and this is due to the high missed appointment rates. HIV/AIDS prevalence in Homabay and Kisumu counties are 18.9% and 12.6% respectively with poverty levels up to 50.3%. While these factors also cause high under-five mortality, uptake of ANC services from earlier stage may help detect the infections and effective measures taken to prevent transmission to the unborn child. In 2019, Homabay and Kisumu Counties had 42% and 35% of their ANC appointments missed respectively [7]. These statistics result into the alarming under-five mortality rates in these counties. The financial expense of missed appointments keeps increasing the cost of the health services and decreasing the efficiency of resource use in these counties because the outpatient service must still pay the salaries of clinicians and administrative staff. A review of literature shows that organizational and access factors are responsible for adherence to ANC and PNC appointments. This study, therefore, assessed the influence of organizational and access factors

on adherence to appointments in antenatal clinics in public hospitals.

Methods

Study design and setting: the study adopted a cross-sectional research design because it involved a study across two public hospitals to answer the research questions. The setting of the study was Homabay and Kisumu Counties, located in the Lake Victoria region. The study selected Homabay and Kisumu County hospitals because of the population coverage, uniformity in services, municipality location, and policy frameworks. These facilities offer similar ANC services to majority of the population in their geographical locations.

Study population: the study targeted a total of four hospital managers and 200 registered ANC clients for reasons of scope and confounding factors that may rise during the study. The hospital managers included maternity in-charges and hospital heads. Only consenting and registered ANC clients with scheduled appointments were included. The study sampled 133 ANC clients (Homabay County Hospital 70, Kisumu County Hospital 63) through random and stratified sampling, and four hospital managers, two from each facility sampled purposely as shown in Table 1. The inclusion criteria included consenting and registered ANC clients with scheduled appointments. Exclusion criteria included non-consenting, unregistered ANC clients and those who did not turn up for appointments.

Sample size and sampling technique: Yamane´s Simplified Sample Formula was used to calculate the sample as follows: the total target population is 200 clients in two hospitals.

Where; n is the sample size; N is the population size; e is the margin of error; n = 200/ (1 + 200(0.05) 2); n = 133.30. Thus, n = 133. The hospitals were purposely sampled because of their county level category in the respective counties, similar profile of the population they serve, services offered, and their geographical municipality location. Random sampling was used to recruit ANC clients at registration. This inferred that ANC clients who turn up in each hospital for ANC visit was recruited. Upon recruiting the targeted sample per hospital, stratified sampling method was used for the clients based on the population of different hospitals in order to have a sample population that is representative of all the hospitals. Purposive sampling was used to sample hospital managers, where the head of the facility and the in-charge in the maternity department were included in the study.

Data collection instrument and technique: the study employed both qualitative and quantitative methods of study during data collection, particularly structured questionnaires among ANC clients. A self-administered structured questionnaire was used among the sample to collect data. Clients were approached at the registration point for data collection and asked to willingly participate in the study. The informed consent was then read out to them in a language they understood and asked to sign if ready and willing to participate. The clients were asked to participate in the study by answering the questions in the structured questionnaire, which were self-administered at this point. Data collection was done twice a week until the sample was exhausted. Key Informant Interview Guide was used among the two hospital managers (hospital head and maternity in-charge) per hospital. The key informant interview guide was administered at the respective offices of the managers.

Ethical consideration: prior to the commencement of the study, permission was obtained from the Kenya Methodist University´s Scientific Research and Ethics Committee (SREC), NASCOTI, and county health offices. Informed consent was also requested from all the respondents prior to the study.

Data analysis: data analysis was done upon completion of data collection. The data from the two hospitals were coded together based on the responses to fit the variations acceptable in the SPSS statistical tool, which was used for analysis of

quantitative data. Analysis was done by running frequencies and cross tabulations of the variables, after which a linear regression model was generated to inform the influence of the independent variables on the dependent variable. A Pearson´s correlation was run to determine p-values and significant levels out of which conclusions were made. Descriptive statistics was used to describe the status of both the independent and dependent variable. Responses from KII were used to inform the findings and for triangulations. Regression models were then used to make inferences on the population and the independent variables, and the dependent variable. Presentation of data was done through narrative illustrations and explanations of the findings.

Results

Influence of organizational factors on adherence to appointments in antenatal clinics: the findings showed that organization of antenatal services in Homabay County and Kisumu County hospitals is inadequate and is affecting adherence to appointments in ANC clinics in the hospitals. Based on the findings patient waiting time and consultation process directly affect adherence to appointments. In both Homabay County hospital and Kisumu County hospital, ANC clients wait at least 30 minutes on a queue before being served. However, majority 26 (37.1%) and 20 (40%) of ANC clients wait for at least 60 minutes in Homabay County and Kisumu County hospitals respectively. This infers that the two county facilities have long patient waiting time that requires attention. In addition, majority 35 (50%) and 20 (40%) and 25 (35.7%) and 16 (32%), of ANC clients in Homabay and Kisumu County hospitals expressed that they were very dissatisfied and dissatisfied with the long waiting time respectively. The dissatisfaction with the waiting time has also affected adherence to appointments greatly as majority of ANC clients 55 (78.6%) and 35 (70%) in Homabay County hospital and Kisumu County hospital, respectively, stated that they have missed their ANC appointments at some point because of the amount of time they take to see a health care provider. The findings also show that consultation process hampers adherence to appointments in ANC clinics. The operating hours of the two facilities are also hindering full adherence to appointments. With both facilities restricting operating hours for ANC clinics to just afternoon, 40 (57.1%) and 30 (60%) of ANC clients report that they are very dissatisfied with operating hours of the ANC clinic. Additionally, due to the limited operating hours of the clinic, majority, 55 (78.6%) and 30 (60%) ANC clients have, at one point or another, missed their appointments due to the facility operating hours in Homabay County hospital and Kisumu County hospital respectively. With these findings, consultation process should, therefore, be improved in both facilities. In fact, majority, 40 (57.1%) and 28 (56%) of ANC clients reported their dissatisfaction with the entire consultation process.

The regression result shows that adherence to appointments is directly influenced by the organizational factors as indicated below: Regression equation:

$$n = \frac{N}{(1 + N(e^2))}$$

Y=missed appointment (dependent variable indicator); X_1= satisfaction with waiting time (independent variable indicator); X_2= satisfaction with consultation process (independent variable indicator). Based on the regression equation above, an increase in satisfaction with waiting time by one unit will result into a decrease in missed appointment by 0.086 and 0.500 units in Homabay County and Kisumu County respectively provided all other factors are held constant. Also, an increase in satisfaction with consultation process by one unit will result into a decrease in missed appointment by 0.143 and 0.500 units provided all other factors are held constant. Organization of antenatal services (independent variable) also have a significance level of up to 0.040, indicating a high significance to adherence to appointment (dependent variable). This is shown in Table 2.

Influence of access factors on adherence to appointments in antenatal clinics: access to services influences adherence to appointments in ANC clinics. Even though access to ANC services in terms of affordability is not a deterrent because the services are mostly free, opportunity cost and proximity to the facility remains a challenge. Based on the findings of the study opportunity cost and facility location are a deterrent to adherence to appointments in ANC clinics. Both Homabay and Kisumu Counties have a high level of poverty of just about 50.3%. This infers that most time is dedicated to feeding families with limited preference given to attending appointments. Besides, majority, 50 (71.4%) and 20 (40%) of ANC clients reported that the opportunity cost of attending ANC appointments is high in Homabay County hospital and Kisumu County hospital respectively. In fact, 20 (28.6%) and 10 (20%) in Homabay and Kisumu affirmed that they would possibly not forgo their work to attend ANC appointment. This shows that the opportunity cost is impairing adherence to ANC appointments. In addition, majority, 55 (78.6%) and 25 (50%) of ANC clients have ever missed their appointment because of the opportunity cost in Homabay County hospital and Kisumu County hospital respectively. Antenatal care clients who are not in close proximity to the hospitals miss more appointments than their counter parts within a close proximity to the facility. While both Homabay County hospital and Kisumu County hospital are situated with the central business district of the town, many health care seekers live in the rural outskirt of the municipality. For example, 10 (14.3%) and 20 (40%) of ANC clients in Homabay and Kisumu travel for at least 60 minutes to get to the facility respectively, with 35 (50%) and 20 (40%) reporting dissatisfaction with the duration of travel to the facility. This dissatisfaction with the proximity to the facility creates avenue for missed appointments as 55 (78.6%) and 20 (40%) of ANC clients in Homabay and Kisumu County hospitals revealing that they have ever missed their ANC appointments because of the facility location. These findings show that facility location and opportunity cost affect adherence to appointments in ANC clinics.

The regression result also shows that access to ANC services directly affect adherence to appointments as indicated below: Regression equation

$$Y = a + bX_1 + cX_2$$

Y=Missed appointment (dependent variable indicator); X_1= satisfaction with facility location (independent variable indicator); X_2= satisfaction with opportunity cost (Independent variable indicator). Based on the regression equation above, an increase in satisfaction with facility location by one unit will result into a decrease in missed appointment by 0.333 and 3.000 units in Homabay County and Kisumu County respectively provided all other factors are held constant. Also, an increase in satisfaction with opportunity cost by one unit will result into a decrease in missed appointment by 0.333 and 1.000 units provided all other factors are held constant. In addition, the access factors variables (independent variable) have a significance level of up to 0.003, indicating a high significance to adherence to appointment (dependent variable). This is shown in Table 3.

Discussion

Influence of organizational factors on adherence to appointments in antenatal clinics: the study findings revealed that organizational factors such as patient waiting time, consultation process, and operating hours directly affect adherence to appointments in antenatal clinics. Long patient waiting time hamper adherence to appointments. These findings are similar to those of [8] who reported that long waiting time discourages patients from seeking care, resulting in high missed appointment rates. The findings also concur with those of [9] which asserted that while availability of services may be a non-issue, especially for ANC clinics, patient waiting time can be a deterrent to delivery and utilization of the services. Therefore, in order to increase adherence to appointments for

ANC services, there is a need for a system intervention that would reduce or limit patient waiting time. These findings demonstrate that long patient waiting time is a deterrent to adherence to appointments for ANC services. In addition, hospital managers from both Homabay County hospital and Kisumu County hospital confirmed that their facility has an average waiting time of 40 minutes and 30 minutes respectively.

The study also established that poor consultation process that entails short operating hours also hinder adherence to appointments in antenatal clinics. These findings are similar to those documented by [10] that consultation process directly influence missed appointment. In their study [10], stated that 30% of patients missed their appointments because the hospitals had a tedious consultation process, which consumed too much time. In their responses as to why they missed their appointments, 70% of patients cited that the consultation process was confusing with limited operating hours. Therefore, these findings concur with those of this study that consultation process is a major contributing factor to missed appointment rates. The above findings show that consultation process in vital in promoting adherence to ANC appointments. Additionally, managers agree with the findings as in both the facilities, it was established that consultation process can be tedious, especially because of the short operating hours in ANC clinics. Like the study findings [10] cite that if healthcare services are to be universal, or a safety net for the poorest, there must be deliberate efforts to improve the consultation process and minimize patient waiting time [10] documented that organizational factors such as consultation process and patient waiting time are among the major factors associated with missed appointments; and that effective and efficient organization of services such as short patient waiting time, and quick, prompt consultation process could reduce missed appointment rates. These findings concur with those of this study, which suggests that in order to reduce missed appointment rates, patient waiting time must be reduced and the consultation process improved.

Influence of access factors on adherence to appointments in antenatal clinics: the study has revealed that access factors such as opportunity cost and facility location can be a deterrent to the utilization of services. Based on the findings of the study, the opportunity cost of seeking antenatal services are high, and the majority of the mothers are not likely to leave work to seek the services. These findings are in agreement with those of [8] that reported that mothers tend to get occupied trying to make ends meet and would rather stay home working than seek scheduled medical services [8] also noted that whether a client chooses to pay for a particular service can also be affected by the client´s assessment of this service´s value. This is also similar to the study finding because the majority find the opportunity cost of seeking the services very high as shown in the above findings of the study [6] also reported that 44% of Kenyans who are ill do not seek health care because of the high cost of accessing the services, either through forgoing their daily businesses or paying for the service. The study findings have also demonstrated that opportunity cost of seeking ANC services contributes significantly to adherence to ANC appointments.

The study results also show that proximity to the facility affects adherence to appointments in antenatal clinics. These findings are in coherent with those of [11] that proximity to the facility or facility location is a great factor that influence missed appointments. According to [11], the further the facility, the more likely that the patients will miss their appointment. The findings are also supported by those of [6] which documented that 18% of Kenyans who are ill do not seek health care because of the distance they have to travel to seek medical care. The study findings are also in agreement with those of [12] which stipulates that availability of services does not guarantee that they will be optimally utilized by the patients, and that while maternal and child health (MCH) services are readily available and affordable, opportunity cost

of accessing the services and facility location still impair access [13] also agree that there is bound to be a high rate of missed appointments in the medical facilities where the opportunity cost is high, or the patients have to travel for longer hours. These findings are in coherence with the results of the study that opportunity cost and facility location directly affect adherence to appointments in antenatal clinics.

Conclusion

Based on the findings and discussions of the study, adherence to appointments in antenatal clinics in Homabay and Kisumu county hospitals are affected by organizational factors such as long patient waiting time and short operating hours. While all ANC clients wait at least 30 minutes before seeing a health care worker, majority wait up to 60 minutes. The dissatisfaction with this long patient waiting time result into missed appointments in ANC clinics as the majority of ANC clients have demonstrated. Increasing the number of consultation points and increasing operating hours would, therefore, improve adherence to appointments in antenatal clinics in Homabay and Kisumu county hospitals. Access factors such as opportunity cost and facility location hamper adherence to appointments in antenatal clinics in Homabay and Kisumu county hospitals, based on the findings and discussions of the study. With the majority of ANC clients falling at the bottom of the pyramid with low income level, many of them find the opportunity cost of adhering to ANC appointments high, and this is particularly because of the high poverty level, up to 50.3%, in Homabay and Kisumu County. Even though Homabay County hospital and Kisumu County hospital are situated within the municipality, many ANC clients residing in the remote areas miss their appointments because of the distance. Proximity to the facilities, therefore, hampers adherence to appointments in ANC clinics in the public hospitals. Devolution of ANC services to lower tier facilities would, therefore, result into improved adherence to ANC appointments.

What is known about this topic

- *There is high under-five mortality rate in Homabay County (91/1000) and Kisumu County (149/1000);*
- *There is low antenatal coverage (at least 4 ANC) in Homabay County (68%) and Kisumu County (61%).*

What this study adds

- *Poor organizational factors such as tedious consultation process, short operating hours and long patient waiting time contribute to the low antenatal coverage in Homabay and Kisumu County hospitals;*
- *Facility location or proximity to the facility affects adherence to antenatal appointments in Homabay and Kisumu counties;*
- *Opportunity cost of seeking antenatal services contributes to the low antenatal coverage in Homabay and Kisumu County hospitals.*

Competing interests

The authors declare no competing interests.

Authors' contributions

Shadrack Ochieng Opon: the main author, data collection, analysis, writing report and the manuscript. Wanja Mwaura Tenambergen, Kezia Muthoni Njoroge: project inception support, supervision, revising report, manuscript revision and approval. All the authors have read and agreed to the final manuscript.

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Tables

Table 1: distribution of sampled population per hospital

Table 2: relationship between organizational factors and missed appointments

Table 3: relationship between access factors and missed appointments

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Table 1: distribution of sampled population per hospital

	Target patients	**Sampled**	**Hospital head**	**Maternity in-charge**
	(N)		**(n)**	**(n)**
Homabay County Hospital	104	70	1	1
Kisumu County Hospital	96	63	1	1
Total population	200	133	2	2

Table 2: relationship between organizational factors and missed appointments									
Coefficients[a]									
Medical Facility	Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	95.0% Confidence interval for B	
			B	Std. Error	Beta			Lower bound	Upper bound
Homa-Bay County Hospital	1	(Constant)	1.429	0.172		8.306	0.000	1.085	1.772
		Satisfaction with waiting time	-0.086	0.049	-0.198	-2.001	0.031	-0.097	0.097
		Satisfaction with consultation process	-0.143	0.070	-0.277	-2.050	0.035	-0.282	-0.004
Kisumu County Hospital	1	(Constant)	4.000	0.000		2.204	0.000	4.000	4.000
		Satisfaction with waiting time	-0.500	0.000	-0.764	-2.002	0.040	-0.500	-0.500
		Satisfaction with consultation process	-0.500	0.000	-0.500	-2.021	0.029	-0.500	-0.500
a. Dependent variable: missed appointment									

Table 3: relationship between access factors and missed appointments								
Coefficients[a]								
Unstandardized coefficients				**Standardized coefficients Beta**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
Medical Facility	**Model**	B	**Std. Error**				**Lower bound**	**Upper bound**
Homa-Bay County Hospital	(Constant)	2.667	0.380		7.026	0.000	1.909	3.424
	Satisfaction with facility location	-0.333	0.069	-0.911	-4.843	0.000	-0.471	-0.196
	Satisfaction with Opportunity cost	-0.333	0.107	-0.585	-3.110	0.003	-0.547	-0.119
Kisumu County Hospital	(Constant)	6.000	0.000		-8.189	0.000	6.000	6.000
	Satisfaction with facility location	-3.000	0.000	-3.000	-9.177	0.000	-3.000	-3.000
	Satisfaction with Opportunity cost	-1.000	0.000	2.449	-5.667	0.000	1.000	1.000
a. Dependent variable: missed appointment								