



ORIGINAL ARTICLE HEALTHCARE SERVICES

Impact of COVID-19 on the Utilization of Maternal and Child Health Services at a Regional Referral Hospital in Kenya

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ABSTRACT

Background and Objective: Pandemics, like COVID-19, disrupt healthcare, potentially reversing progress in various disease areas. The impact on maternal and child health (MCH) services in Kenya during the pandemic is yet to be determined. Recognizing this impact is crucial for formulating policies and programs that minimize disruptions in reproductive health services during future health crises. The purpose of this study was to determine the effect of COVID-19 on the uptake of MCH services at Thika Level V Hospital, a regional referral hospital in Kenya.

Methods: In this cross-sectional mixed methods study, we reviewed antenatal clinic (ANC), MCH, and family planning (FP) registers for data on the uptake of the various services during the COVID-19 pandemic (July to October 2020) compared to a year before the COVID-19 pandemic (July to October 2019). MCH clients (N = 60) and healthcare workers (N = 19) were interviewed about the impact of the pandemic on MCH services at the hospital. Differences in clinic attendance before and during the pandemic were compared using the student t-test. Thematic analysis was conducted on the interview responses.

Results: The number of MCH/FP clients dropped from 12,915 pre-pandemic to 7,429 during the pandemic. Significant differences were noted in ANC revisits ($p = 0.026$) and those completing the World Health Organization recommended minimum of four ANC visits ($p < 0.001$) during the COVID-19 pandemic. The number of revisits at the child welfare clinic was also significantly lower ($p = 0.004$) during the COVID-19 lockdown period. MCH clients stated that the decline in the uptake of MCH services was attributable to the fear of contracting disease, financial difficulties, and strain on the healthcare workforce.

Conclusion and Global Health Implications: This study found a decline in access to MCH/FP services during the COVID-19 crisis with the potential to reverse gains made in securing the safety of the pregnant mother and unborn baby.

Keywords: Antenatal; Maternal and Child Health; COVID-19 Pandemic; Child Health Service; Family Planning Services; Pregnant Mother

INTRODUCTION

Global indicators of a country's health and well-being include scores related to access to good quality maternal and child health (MCH) services. The MCH covers the period of a woman's experiences through pregnancy, birth, and the immediate season after delivery. These events define some of the most vulnerable and risky moments in the life of a female, which require additional support to ensure the quality of life for both the mothers and children. The World Health Organization (WHO) concedes that an estimated 300,000 deaths in 2017 were due to

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issues related to MCH. This translates to 800 women dying daily for various reasons associated with MCH.^[1] This mortality rate makes MCH a leading cause of death alongside the more noted and publicized infectious killers such as malaria (627,000 in 2020),^[2] tuberculosis (1.5 million in 2020),^[3] and HIV/AIDs (650,000 in 2021).^[4] Notably, pregnant women and young children also bear the heaviest brunt of the diseases mentioned. Realizing the importance of MCH in the overall socioeconomic advancement of a society, the United Nations dedicated one of its sustainable development goals (SDGs), SDG 3, to securing quality and accessible MCH across the world. The vision is to have no more than 70 deaths per 100,000 live births by the year 2030.^[5]

Low- and middle-income countries (LMICs) grapple with numerous health and socioeconomic challenges that contribute to the spiral of poverty and poor health witnessed in these countries. The same factors, which include inadequate number and quality of healthcare professionals, poor access to health facilities, and quality of health infrastructure, intersect to influence the level of MCH care received by mothers and their newborn babies.^[6,7]

The inequity and inequality in the provision of MCH services are unmasked by the revelation that poorer countries bear over 99% of global maternal mortality. This underscores the urgent need to halt the trend and make some progress toward ensuring improved access to MCH.^[6] The morbidity and mortality associated with the prenatal and postnatal periods frequently involve complications revolving around hemorrhage, pregnancy-related hypertension, and obstructed labor. Regular access to MCH services during pregnancy can reduce the dangers associated with unsupervised labor and the related processes of childbirth, thereby promoting MCH. Besides, unhindered access to sexual and reproductive health throughout the prenatal and postnatal periods is critical in maintaining the health of the mother and unborn child.^[8]

The fragility of healthcare systems, as experienced in most LMICs renders these countries vulnerable to impromptu disruptions by natural calamities such as the COVID-19 pandemic. When such a tragedy strikes, the common reaction in resource-constrained countries is to shift health priorities, often leading to a health crisis and additional strain on health resources. In these circumstances, it is easy to lose traction on strides made in tackling perennial disease challenges. The sad reality is that gains made have been reversed while seeking to grapple with the new disaster. Many mainstream healthcare services, including access to critical MCH services, usually get derailed.^[8] For example, a recent report intimates that nearly 40% higher maternal mortality per month could have occurred due to the COVID-19 pandemic and related challenges.^[9] Some of the factors implicated in

worsening this trend are reduced demand for services due to the fear of contracting COVID-19. This was in addition to harsh economic times occasioned by job losses during the pandemic. Consequently, it was challenging to access basic healthcare needs as other pressing needs took precedence.

Many LMICs lack robust and systematic emergency preparedness plans to guide the response to unforeseen occurrences. Where such plans have been mooted, they have often been faulted as being politically motivated and hardly last long enough to provide succor in future calamities.^[10] The deficiency of a vibrant monitoring and evaluation framework makes implementing emergency response in such uncertain times as posed by the COVID-19 pandemic problematic and risks eroding steady gains made toward strengthening access to MCH services.

Although generally acknowledged to have had disruptive consequences on many fronts, including in the provision of healthcare services, there is a lack of an objective study detailing the repercussions of the COVID-19 pandemic on the provision and access to MCH and family planning (FP) services in Kenya. This study was conducted to assess the impact of COVID-19 pandemic on access to MCH at a referral health facility that serves low- to middle-class residents of Kiambu County and neighboring regions, some 40 km northeast of the capital city of Kenya, Nairobi.

Recognizing challenges faced by pregnant mothers seeking MCH care during the pandemic offers insights for future preparedness. This understanding can prevent knee-jerk reactions by healthcare systems mitigating negative consequences. It contributes to a more effective response and prepares the country for potential pandemics, fostering better MCH outcomes.

METHODS

Study Site and Study Design

This cross-sectional hospital study was carried out at the Thika Level V Hospital (TL5H), a regional referral health facility situated 40 km northeast of Nairobi, the capital city of Kenya. The TL5H has a catchment population of more than 280,000 people.^[11] Among others, the hospital offers maternity services, immunization services, and FP services. It also offers *Linda Mama* Services (a Swahili phrase that literally translates to “protect the mother”), a publicly funded health scheme that ensures that pregnant women and infants have access to quality and affordable healthcare services.

Study Population and Data

The study involved records of women of reproductive age, who attended MCH/FP clinic between July and October 2019

(pre-COVID-19 period) and between July and October 2020 (COVID-19 era). Women attending the MCH/FP clinic post-COVID lockdown restrictions and the health professionals offering the required services were also interviewed to provide complementary information to meet the study objectives. Information gleaned from the patients' records included clinic attendance, type of services sought, and adherence to the recommended number of clinic visits. During the interviews, selected clients and health professionals were requested to respond to questions on the impact of the COVID-19 pandemic on the utilization of MCH/FP services and possible measures to mitigate against challenges posed by future pandemics. Ethical approval was obtained from the Jomo Kenyatta University of Agriculture and Technology Institutional Research and Ethics Committee before the commencement of the study (JKU/ERC/02316/0135).

Eligibility Criteria and Sampling Method

For inclusion in the study, the patient records had to relate to women seeking maternal and child healthcare services from July to October 2019 (pre-COVID period) and from July to October 2020 (pandemic period). For the interviews, only clients seeking MCH/FP services after the lifting of COVID-19 lockdown restrictions in the country were allowed to participate in the study. Consequently, files pertaining to women seeking other services other than MCH during the predetermined periods were excluded from the study. Also excluded were clients seeking other types of services apart from those related to MCH/FP. We applied a purposive sampling technique in seeking candidates for interviews until the point of saturation.

Data Collection, Management, and Analysis

The STROBE guideline^[12] was adopted for the study, and a preapproved checklist was used to identify patient files, which met the inclusion criteria. The checklist had three main sections, including those for demographic data, type of services rendered, and a semi-structured questionnaire comprising both open-ended and closed-ended responses to allow for the recording of information during interviews. Data regarding the number of women who attended the MCH clinic before and during the pandemic was obtained from the clinic MCH/FP register. Specifically, we sought information on the utilization of antenatal care, FP, and immunization services during the study periods, as described previously. Face-to-face interviews were held with clients and health professionals during the post-COVID-19 restrictions period. Closed-ended questions included inquiries on whether they perceived that COVID-19 had disrupted hospital functions regarding access to MCH/FP services and if they deemed

successful the interventions they applied to overcome the challenges. However, open-ended questions were related to finding out the efforts adapted to improve the uptake of MCH/FP services at the hospital during the pandemic and suggestions for dealing with such situations in the future.

Data analysis was performed using IBM Statistical Package for Social Sciences (SPSS) software version 26.0 (SPSS Inc., Chicago, IL). The sociodemographic characteristics of the participants interviewed in this study were summarized into frequencies and percentages. Data on utilization of MCH/FP services was summarized using means and standard deviations. The independent samples t-test was applied to compare differences in the uptake of MCH/FP services during the pre- and post-COVID-19 pandemic periods. In all cases, the level of significance was set at $p \leq 0.05$. Quantitative responses were categorized into themes for data analysis.

RESULTS

Sociodemographic Characteristics of the MCH/FP Clients

We interviewed 60 clients attending the MCH/FP Clinic during the COVID-19 period [Table 1]. The majority (38, 63.3%) were women between 18 and 40 years of age, and more than half (32, 53%) were married. Most of the respondents (47, 78.3%) were residents of Kiambu County where the hospital is located, with half of the total number of respondents (30, 50%) accessing the hospital via public service vehicles. Antenatal care services were sought by half of the respondents, and most clients at both the antenatal (17, 56.7%) and FP (8, 72.7%) clinics were new clients.

Utilization of MCH/FP Services Before and During the COVID-19 Pandemic

The number of clients seeking care at MCH/FP Clinic services at TL5H prior to and during the COVID-19 pandemic is summarized in Table 2. There was a 42.5% (12, 915–7,429) decrease in the number of clients at the MCH/FP Clinic during the pandemic period. Most clients during both periods were revisits seeking child welfare clinic (CWC) services. We performed an independent samples t-test to compare the differences in the uptake of the services at the MCH/FP clinic before and during the lockdown period. The clinic recorded significantly lower numbers in the antenatal clinic (ANC) revisits ($p = 0.026$) and those completing the WHO-recommended minimum of four ANC visits ($p < 0.001$) during the pandemic. There was a significant decrease in the detection of anemia ($p = 0.003$) and adolescent pregnancy ($p < 0.001$) at the height of the pandemic. The number of revisits at the CWC was also significantly lower ($p = 0.004$) during the COVID-19 lockdown period compared to a similar duration prior to the pandemic. Although the uptake

Table 1: Sociodemographic characteristics of clients interviewed at the MCH/FP clinic.

Characteristic	Category	N (%)
Age (years)	<18	7 (11.7)
	18–40	38 (63.3)
	40 and above	15 (25.0)
Marital status	Married	32 (53.3)
	Separated	5 (8.3)
	Single	20 (33.3)
	Widowed	3 (5.0)
Residence (county)	Kiambu	47 (78.3)
	Kitui	1 (1.7)
	Murang'a	9 (15.0)
	Nairobi	3 (5.0)
Employment status	Full-time	18 (30.0)
	Part-time	5 (8.3)
	Self-employed	15 (25.0)
	Student	1 (1.7)
	Unemployed	21 (35.0)
Mode of transport	Walking	1 (1.7)
	Motorcycle	7 (11.7)
	Private car	14 (23.3)
	Public vehicle	30 (50.0)
	Hired vehicle (taxi)	8 (13.3)
ANC services sought	Antenatal care	30 (50.0)
	Family planning	11 (18.3)
	Immunization	10 (16.7)
	Nursery	5 (8.3)
	Post-abortive care	4 (6.7)
Type of ANC clients	New	17 (56.7)
	Revisit	13 (43.3)
Type of FP clients	New	8 (72.7)
	Revisit	3 (28.3)
Type of immunization given	Measles	3 (30.0)
	Pentavalent 1 (6 weeks)	1 (10.0)
	Pentavalent 2 (10 weeks)	1 (10.0)
	Tetanus toxoid (X)	5 (50.0)

MCH: Maternal and child health, ANC: Antenatal clinic, FP: Family planning, N: Number of clients

of FP services by various age groups declined during the pandemic, this was not statistically significant.

MCH/FP Clients Perceptions on the Reasons for Decline in the Uptake of MCH/FP Services During the COVID-19 Pandemic

All the clients (n = 60) interviewed noted that the pandemic had caused a decline in the uptake of MCH/FP services. Most (28, 46.7%) attributed the trend to the fear of visiting health facilities [Figure 1]. Restrictions imposed during the COVID-19 period were reported to be an impediment to the utilization of MCH services by 11 (18.3%) of the clients.

Suggestions by MCH/FP Clients and Healthcare Workers on Dealing with Future Pandemics

We interviewed clients and healthcare workers at the MCH/FP clinic on how future pandemics should be handled to ensure minimum disruptions in health services. Out of the 36 clients, who responded to this question, most (9, 25%) believed increasing the number of healthcare workers would help in absorbing the strain imposed by pandemics. Other proposed interventions included an increase in health infrastructure (7, 19.4%) and healthcare funding (5, 13.9%). A total of 19 healthcare providers, including 13 (68.3%) nurses, an HIV Testing Services (HTS) counselor (1, 5.3%), and five (26.3%) nursing students, were interviewed. There were 10 (52.6%) male workers and most (7, 36.8%) of the workers were aged between 30 and 49 years. Most workers suggested the need for research on pandemics (6, 31.6%) and emergency preparedness (5, 26.3%) as important measures in handling future pandemics. Other measures suggested by the healthcare workers included the need for additional staff (15.79%), increased physical infrastructure (21.05%), and community awareness of pandemics (5.26%).

DISCUSSION

Responding to a dearth of empirical evidence on the impact of COVID-19 in the provision of and access to MCH/FP services in the country, this study sought to assess the impact of COVID-19 on the utilization of MCH/FP services at TL5H, a major referral health institution in Central Kenya and with a wide catchment area. We found a decline in the number of clients seeking care at the MCH/FP clinic during the pandemic. Notably, the number of women completing four ANC visits was lower during the COVID-19 period compared to the pre-COVID period. ANC visits provide healthcare workers with the opportunity to deliver evidence-based interventions to improve pregnancy outcomes. Consequently, the WHO recommends a minimum of four ANC visits for women with uncomplicated pregnancies.^[13] Services provided during the ANC include screening for signs and symptoms that may lead to pregnancy complications, iron and folic acid supplementation, tetanus toxoid immunization, provision of insecticide-treated mosquito nets, and intermittent prevention of malaria. We observed significant reductions in these services, a finding that could have potentially affected MCH outcomes during the pandemic. Previous studies have found an association between ANC attendance and delivery in healthcare facilities as well as the utilization of postnatal services.^[14]

In this study, the number of children on follow-up at the CWC declined during the lockdown period. The CWC provides a range of services to children under five years of age

Table 2: Uptake of MCH/FP services before and during the COVID-19 pandemic.

Type of clinic	Clients/services category	Pre-COVID-19 N = 12915 (mean ± SD)	COVID-19 era N = 7429 (mean ± SD)	p-value
Antenatal	New clients*	315.75 ± 55.40	224.25 ± 105.44	0.175
	ANC revisits*	912.25 ± 71.74	585.75 ± 211.38	0.026
	No. with Hb < 11g/dL	190.5 ± 21.67	87.5 ± 35.27	0.003
	No. Completed four ANC visits	317.25 ± 37.21	111.25 ± 32.60	<0.001
	No. tested for syphilis	315.75 ± 55.40	224.25 ± 105.44	0.175
	No. counseled on infant feeding	12.5 ± 1.92	23.50 ± 17.60	0.3
	No. of adolescents (15–19 years) presenting with pregnancy	72 ± 7.87	15.75 ± 4.27	<0.001
Child welfare	New clients	270.50 ± 20.42	124 ± 149.60	0.144
	Revisits	1284.50 ± 287.05	596.50 ± 413.23	0.034
Family planning	Adults	341 ± 55.36	258.50 ± 105.89	0.217
	Adolescents (15–19 years)	7.50 ± 5.45	6 ± 4.24	0.679
	Youth (20–24 years)	97.25 ± 15.65	62.25 ± 24.36	0.052

*Both new and revisit clients who attended the antenatal clinic (ANC) pre- and during the COVID-19 pandemic were offered breast examination services, were advised on exercise, and were issued with combined ferrous sulphate-folic acid supplements. MCH: Maternal and child health, FP: Family planning, N: Number of clients, SD: Standard deviation. Bold values indicate p-value <0.05.

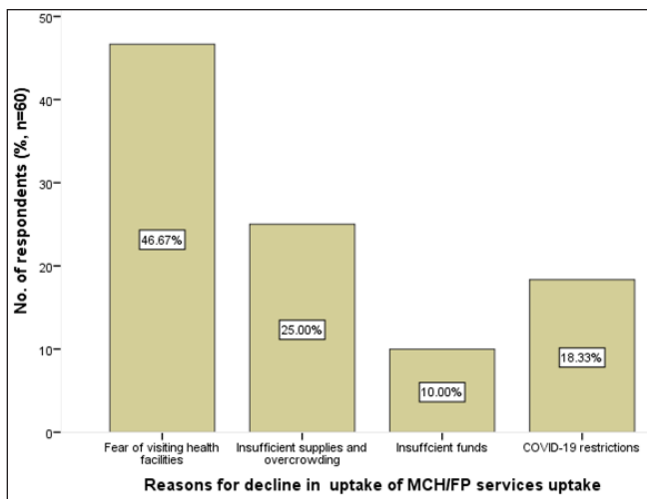


Figure 1: Maternal and child health (MCH)/Family planning (FP) clients' perceived reasons for the decline in the uptake of MCH/FP services during the COVID-19 lockdown period.

that include weight and height measurements and charting, immunization, micronutrient supplementation, caregiver education and counseling, screening, and management of childhood illnesses, among others. In addition, the information obtained during the routine clinic visits may be used to create demand for other health services.

We also interviewed MCH/FP clients during the pandemic period to gain insights into their experiences and suggestions on how such situations should be handled in the future. Among the clients interviewed, we noted that there were

fewer ANC and FP revisits compared to the newly enrolled clients. This may be an indicator of loss to follow-up for both types of clients. For women on contraceptives, routine follow-up visits help to monitor side effects and discuss other concerns related to the FP method. In addition, frequent client-provider interactions have the potential to reinforce motivation and usage instructions, which may contribute to the effectiveness of contraceptives.^[15] Therefore, there is a need for patient education on the need for follow-up after initiation of FP methods. Additionally, stakeholders in healthcare should devise interventions to ensure client follow-up even in cases of travel restrictions or heightened need for social distancing such as those witnessed during the COVID-19 pandemic. This may include the adoption of mobile health (mhealth) telemedicine or telehealth solutions to educate the public on various aspects of the use of FP methods.

The most cited reason by clients for the decline in the uptake of MCH/FP services during the pandemic was the fear of contracting disease upon visiting the health facilities. In earlier pandemics, healthcare providers and their families have been shunned by their communities. For example, healthcare providers handling severe acute respiratory syndrome (SARS) patients in Taiwan and Hong Kong reported ostracization in their communities for fear that they were infected with SARS coronavirus.^[16,17] Evidence suggests that both healthcare providers and the public are more likely to acquire COVID-19 in the community rather than in healthcare facilities.^[18] This finding calls for public

health education on the risks posed by healthcare providers and facilities to the general population in the transmission of COVID-19 and other infectious diseases.

Regarding the effects of the pandemic on the MCH outcomes, a considerable proportion of the MCH/FP clients indicated that they did not face any challenges when seeking healthcare services. This may be attributed to the fact that most respondents were residing within the county in which the study center is located and were therefore not affected by the COVID-19 travel restrictions which mostly impacted those who needed to travel across counties.

Most clients proposed that increasing the number of healthcare workers would be a useful measure to contain the negative consequences of future disease outbreaks. During the pandemic, health facilities were overwhelmed with increasing numbers of patients seeking care for acute COVID-19 respiratory distress syndrome. Consequently, most resources, including healthcare workers, were redirected and dedicated almost entirely to COVID-19 management, to the detriment of patients suffering from other sicknesses or requiring other healthcare services.^[19]

Healthcare workers interviewed in our study acknowledged that the pandemic disrupted MCH/FP services at both individual and institutional levels. Among others, COVID-19 had various inimical effects on healthcare providers, including high rates of mortality, financial hardships, anxiety, and fear arising from conflicting information about the disease.^[20] All these concerns, in addition to the usual strain imposed by the nature of the healthcare profession, can negatively affect the productivity and performance of an individual. Efforts should, therefore be made to ensure the wellness of frontline workers and identify modifiable factors that may affect their well-being and performance.

Possibly arising from the fact that COVID-19 was a new phenomenon with little known about its management, proactive research on pandemics featured frequently as a suggestion for future pandemic preparedness. In addition, the upsurge of patients within a short time frame was a recipe for burnout among healthcare workers; increasing the number of healthcare workers was highlighted as a critical intervention in addressing future pandemics.

Limitations of the Study

We relied on data collected by the hospital staff, which is subject to inaccuracies that could have occurred in the entry of data. However, since the data had been collected and recorded before the study was done, this reduces the probability of

biased reporting. Also, the results from this single-centered study may not be extrapolated to other hospitals.

CONCLUSION AND GLOBAL HEALTH IMPLICATIONS

The COVID-19 pandemic led to significant decreases in the uptake of MCH/FP services at the study site. Both healthcare workers and clients experienced challenges in providing and accessing MCH/FP services, respectively. There is a need to devise measures to mitigate the disruptive consequences of pandemics in the future to halt the reversal of gains in the provision of other pressing and equally crucial healthcare services.

Key Messages

- The COVID-19 pandemic resulted in a 42.5% decline in the uptake of MCH/FP services at the study site.
- We noted significant reductions in the number of women completing the WHO- recommended minimum of four ANC during the pandemic period. This may lead to poor pregnancy and newborn outcomes. MCH/FP clients cited the fear of contracting COVID-19 at the healthcare facility as the major reason for the decline in the uptake of MCH/FP services during the pandemic.

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COMPLIANCE WITH ETHICAL STANDARDS

Conflicts of Interest

The authors declare no competing interests.

Financial Disclosure

Nothing to declare.

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Ethics Approval

Ethical clearance was obtained from the Jomo Kenyatta University of Agriculture and Technology Institutional Research and Ethics Committee before the commencement

of the research study (JKU/ERC/02316/0135). Administrative approval to collect data from the patient files was also received from the director of medical services of the TL5H. To uphold confidentiality, patient names and file numbers were coded using serial numbers such that it is not possible to retrace patient identity.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent.

Use of Artificial Intelligence (AI)-Assisted Technology for Manuscript Preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

Disclaimer

None.

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