Impact of Coronavirus Disease 2019 on Antenatal Care Services at Kampala International University Teaching Hospital

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ABSTRACT

This study aimed to determine the impact of COVID-19 on antenatal care services at Kampala International University Hospital from 2019 to 2020. This was a retrospective study. We reviewed the records of mothers who attended the antenatal care clinic at Kampala International University Teaching Hospital during the months of March, April and May of 2019 and 2020. We also had Medical staff directly provide prenatal care at the clinic during prenatal check-ups. A questionnaire to report on challenges. The obtained data were analyzed using SPSS software version 22. A total of data from 2,379 customers was analyzed. Antenatal care participation decreased by 7.1% in 2020. Services significantly affected were fetal heart monitoring and intermittent malaria prophylaxis. The proportion of mothers over 22 weeks who did not perform fetal heart monitoring was higher in 2020 (2.0% vs.0.0%, p<0.001). The proportion of mothers over 16 weeks who did not receive IPT treatment was also higher in the 2020 period (28.7% vs 14.2%, p<0.001). The challenges reported by all healthcare workers, and thus referred to as the main challenges during COVID 2020, were lack of transportation, overwork and exhaustion, and fear of infection COVID-19. Participation in antenatal care decreased during COVID-19 in 2020. The services most affected were auscultation and intermittent malaria prophylaxis. The main challenges are lack of transportation, overwork and exhaustion, as well as fear of contracting Covid-19. Preparations for epidemics and natural disasters must be done so that when epidemics occur, they will be affected as in this case.

Keywords: Coronavirus 2019, Public health, Antenatal care services, Healthcare workers, Sexual and reproductive health.

INTRODUCTION

Antenatal care (ANC) helps to ensure the well-being of the mother and fetus through early detection of risks in pregnancy, prevention of pregnancy and labour complications and ensures thesafe delivery of mother and child [1]. This chapter gives an overview of the study and includes the background to the study, statement of the problem, research questions, broad objective, specific objectives, justification of the study, scope of the study and operational definitions. COVID-19 was first reported in Wuhan, a city located in the Hubei Province of China in December 2019 and at the time it was being treated as pneumonia [2]. It wasn't until early 2020 that the World Health Organization (WHO)

named it the COVID-19 virus and because it had spread across continents it was declared a pandemic by WHO on 11 March 2020 [3]. Initially, the WHO recommended that countries adopt lockdown measures, ensure social distancing, and encourage their populations to stay at home and practice hand hygiene to contain the further spread of the virus [4]. Countries have implemented stringent mitigation measures in order to reduce transmissions and enable their health systems to manage the pandemic^[5]. Globally, the COVID-19 pandemic and these mitigation measures have caused detrimental effects on countries' health systems, economies, and other sectors, especially in lowincome countries like Uganda [6]. Most

INOSR APPLIED SCIENCES 10(3):84-94, 2023 countries in Africa adopted these measures without detailed models of their consequences Preparation [7]. and readiness measures against COVID-19 in Uganda began between January and March 2020. focusing on health systems strengthening and capacity building, aided by early allocation of WHO funding [8]. From 2nd March, the public was informed of the threat of COVID-19, with education and training subsequently disseminated [8]. Testing focused on contacts of identified cases and those returning from travel, with populationwide lockdown measures imposed quickly after the first case in Uganda was reported on 21 March 2020 (Health, 2020). This included border closures, port-of-entry screenings and quarantines for travellers [8]. By 25 March, this escalated to a ban on group gatherings and non-essential internal travel, the recommendation to work from home and close schools [8]. The travel restrictions included the cessation of all public transport and a ban on the use of private vehicles without explicit permission to travel [9]. At a local level, non-essential visits to Kawempe National Referral Hospital (KNRH) were prohibited for a short time (from 23 March 2020 to 21 April 2020), whichincluded the closure of ANC and childhood immunization clinics [10]. The germ theory of disease was the basis of our study. It states that; microorganisms known as pathogens or "germs" can lead to disease [11]. These small organisms toosmall to see without magnification, invade humans, other animals and other living hosts [11]. The advent of the germ theory of disease, anticipated by Ignaz Semmelweis (1818-65) and consolidated by Louis Pasteur (1822-95), strongly influenced medical opinion toward an antibacterial stance [11]. Without antiseptic and aseptic environments and procedures, along with antibiotics and antiviral and anti-fungal agents, modernmedicine would be nearly impossible [11]. The pandemic started due to a viral infection. This virus has been known to be highly contagious. Because it was thought to be so believed contagious, it was that minimizing contact could reduce spread

and this was thought as the only chance to stop the spread of the virus and control the pandemic. To minimize contact, many measures were put in place globally and these are thought to have affected antenatal care [3]. The pandemic's indirect effects will likely surpass the direct infection effects on women and newborns. Previous outbreaks severely reduced health systems' capacity to provide essential maternal and newborn health (MNH) care, with negative impacts on health outcomes [12]; [13]. The COVID-19 pandemic has significantly impacted all countries globally, even those with a proportionally small number of cases like Australia [14]. COVID-19 illustrates the susceptibility of maternity care services to emergencies, by reversing hard-won gains in healthcare utilization and use of evidence-based practices. Maternity care differs from other services, in as much as healthy women are being brought into health facilities that are operating suboptimally, and potentially increasing the risk of infection, from COVID-19 and other healthcare-associated infections [13]. A global report in 2017 showed that out of five women, only three attended antenatal care at a minimum of four antenatal visits. with Sub-Saharan African countries having only 52% of women having at least four ANC visits even in the absence of the pandemic [15]. The pandemic has also resulted in the redirection of funds and attention by governments, donors, and stakeholders towards COVID-19 containment efforts, thereby diverting focus from other important issues including sexual and reproductive health [16]. United Nations Population Fund's response to COVID-19 as contained in their COVID-19 Technical Brief for Maternity Services recommends that countries create a sustainable ANC service delivery model applicable to their own country's context, ensuring that there is adequate collaboration of care across ANC contact points through defined mechanisms [16]. At Kawempe Hospital in Kampala, all antenatal and vaccination services ceased in lockdown for 4 weeks. During the 3-month lockdown. the number of antenatal attendances

INOSR APPLIED SCIENCES 10(3):84-94, 2023 significantly decreased and remained below pre-COVID levels (370 fewer/per [10]. Increases during month) the lockdown and immediately post-lockdown included the number of women treated for high blood pressure, eclampsia and preeclampsia (218 more/month), adverse pregnancy outcomes (stillbirths, lowbirth- weight and premature infant births), and the rate of neonatal unit admissions, neonatal deaths and abortions [10]. Even though there is data on changes in antenatal utilization in Kampala, it was over a short periodof time

Study design

This was a cross-sectional study in which we reviewed records for objectives one and two, and hadthe health workers that were attached to the antenatal care clinic fill out a questionnaire. This design enabled us to achieve the objectives of our study.

Area of Study

The study was done at Kampala International Teaching University Hospital (KIU-TH), which is a not-for-profit hospital located in western Uganda. KIU-TH has an antenatal care clinic that runs every day. The clinic is run by a team of midwives and a gynaecologist or a senior house officer in the department of gynaecology is always available to see high-risk mothers. The antenatal care clinic has been functional even during the Covid-19 pandemic period. Every patient who attends the clinic is recorded in a structured book that captures the patient information and the services offered.

Study population

All records of mothers who attended antenatal at KIU-H for the months of March to May in the years 2019 and 2020 were considered. The health workers that were attached to the antenatal care clinic the same period filled out a in questionnaire to identify the differences in challenges faced.

Inclusion Criteria

For objectives one and two: All records of mothers that attended ANC at KIU from 1st March 2019 to 30th May 2019 and 1st March 2020 to 30th May 2020. For objective three: All health workers at KIU- for the few months of lockdown. More so, the changes were only reported for Mulago Hospital which is an urban setting in the capital of the country and little is known about what happened in the rural areas Like Ishaka in western Uganda. More so, the challenges faced by the antenatal care service providers in Uganda, have not been assessed, therefore, this study focuses on determining the impact of COVID-19 on antenatal care services at International Kampala University Teaching Hospital (KIU-TH) between 2019 and 2020.

METHODOLOGY

TH attached to the ANC clinic from 1st March 2019 to 30th May 2019 and 1st March 2020 to 30th May 2020 who consented to fill out the questionnaire.

Exclusion Criteria

For objectives one and two: All records that were incomplete were excluded. For Objective Three: All health workers who were attached to ANC in the study period, but did not go to the clinic at all were excluded.

Sample size determination

Since all records of patients that attended ANC at KIU-TH in the study period were reviewed and all health workers that were attached to the clinic were considered for filling the questionnaire, there was no need to calculate the sample size.

Sampling procedure

Consecutive recruitment was done; all records for the study period that fulfilled the eligibility criteria were included. All health workers who were attached to the ANC clinic during the study period were contacted.

Data collection methods

All antenatal record books for the study period were reviewed. The social demographic information. clinical information and the services received by the mothers were filled in the data collection form. The total number of mothers who came for the ANC in both years were determined. The duty rosters for the department of obstetrics and gynecology for the study period were obtained from the in-charge and the head of department. All health workers that

INOSR APPLIED SCIENCES 10(3):84-94, 2023 were attached to the antenatal care clinic and their phone contacts were obtained. The health workers were called to set an appointment when they could fill out the questionnaire. Those that were not in Ishaka at the moment had the soft copy of the questionnaire emailed to them if they consented to fill, it and sent back after filling. A special questionnaire was filled out by the head of the department and the

in-charge.

The information obtained was recorded in the data collection form that had an identification number and not the name in order to maintain confidentiality. The data collection forms are shown in appendix I. Figure 2 below shows the process of sampling, data collection and analysis for objective three.



Figure 1: Showing the process of sampling, data collection and analysis

Data collection tools and instruments

A data collection form was used to collect the mother's particulars and other relevant data obtained from thepatient's book as shown in Appendix I. A questionnaire was filled out by health workers to determine the

challenges faced. The data collection form and questionnaire were tested for validity and reliability before data collection started.

Data collection methods

Using the data collection form, information relevant to the study was obtained from the records. A questionnaire was used to obtain the challenges faced by Antenatal care service providers.

Data management

The data collection forms had patient codes instead of names and were only accessible to investigators. Hard copy records were kept in a locked cabinet and

INOSR APPLIED SCIENCES 10(3):84-94, 2023 6 months following completion of the study, they will be destroyed but electronic records will be kept in a password-protected file on the investigator's password-protected computer, and on completion of the study, they will be saved on a Digital Versatile Disc (DVD) that will be submitted to KIU registry so that when the investigator has a valid reason to access them, will request access from the KIU registry management.

Quality control

The data entered was re-read thrice to ensure no mistakes were made. Data analysis was done under the supervision of a biostaticin.

Data analysis

The data obtained was summarized in Excel sheets using Microsoft Office Excel. The summarized data was imported into Statistical Package for Social Sciences (SPSS Inc., Chicago, USA, version 22.0 for Windows). For objective one; using

In this study, the antenatal care records for mothers who attended antenatal care between March and May for the years 2019 and 2020 were reviewed. The 4 staff who were allocated to the antenatal care clinic and the in-charge filled out questionnaires descriptive statistics, the percentage difference in antenatal care attendance between the two periods was computed. The two attendances were presented in a bar graph to show the difference. For objective two, the percentage of patients that received a specific service in both vears was computed and presented in a table to compare the difference in the two vears. A chi-square test was used to assess whether the difference in the services offered was significant. A p-value less or equal to 0.05 was considered significant. To determine challenges faced by the antenatal service care providers, the information obtained from the health care providers was coded and the proportion of health workers that stated a specific challenge was computed to determine the main challenges faced, and all challenges were presented in a pie chart.

RESULTS

about the new challenges faced in the 2020 period that were not faced in the 2019 period. This chapter contains the details of the findings. Inthis study data of **2379** clients that attended antenatal care was analyzed.

Characteristics	Statistic	<u> </u>
Age	Mean=28.3, SD=5.96, Min=17.0, Max=49.0	
Weeks of amenorrhea	Mean=27.39, SD=7.93, Min=7, Max=42	
Weight	Mean=70.2, SD=11.3, Min=50.0, Max=134.5	
	Frequency	Percentage
Month		
March	902	37.9
April	743	31.2
May	734	30.9
District		
Bushenyi	1814	76.3
Sheema	160	6.7
Mitooma	285	12.0
Ntungamo	31	1.3
Rubirizi	84	3.5
Others	5	0.2
Visit Number		
1 st	709	29.8

Characteristics of study participants Table 1: Showing characteristics of the study participants

INOSR APPLIED SCIENCES 10(3):84-94, 2023			
2 nd	684	28.8	
3rd	580	24.4	
4 th	261	11.0	
5 th	110	4.6	
6 th	32	1.3	
7 th	3	0.1	

SD=Standard deviation, Min=Minimum, Max=Maximum.

In this study, the mean age was 28.3(5.96), the mean weeks of amenorrhea were 27.4(7.93), and the mean weight was 70.2 (11.3). Of the clients whose data 2379 was analyzed, the majority were from the

Bushenyi district (76.3%) and the majority attended for the first (29.8%) or second (28.8%) visit. Percentage change in number of mothers attending antenatal care at KIU-TH between2019 and 2020.



Year

Figure 2: is a bar graph showing the number of mothers who attended antenatal care in the twoperiods

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Table 2; shows the percentage change in the number of mothers attending antenatal care at KIU-TH between 2019 and 2020.

Year		Number of visits	Percentage	Confidence interval	Percentage change
	2019	1233	51.8	49.9-53.8	7 1
	2020	1146	48.2	46.2-50.1	7.1

This study showed that there was a 7.1% reduction in the number of antenatal visits during the 2020 Covid-19 lockdown period.

Comparison of the services offered to mothers receiving antenatal care at KIU	-TH
between 2019 and 2020	

Service	The year 2019	The year	Chi-squire P-
	N(%)	2020 N (%)	value
Blood pressure meas	urement		
Not Done	1(0.1)	4(0.3)	0.202
Done	1232(99.9)	1142(99.7)	
Haemoglobin measu	rement (on the 1 st visit)		
Not done	19 (5.3)	29(8.3)	0.134
Done	342 (94.7)	319 (91.7)	
Syphilis status			
Not known	3(0.2)	2(0.2)	1.000
Known	1230(99.8)	1144(99.8)	
Hepatitis B status			
Not known	1026(83.2)	957(83.5)	0.869
Known	207(16.8)	189(16.5)	
Fetal heart listening	(for those >22 WOA)		
Done	915(100.0)	789(98.0)	< 0.001
Not done	0(0.0)	16(2.0)	
IPT administration (f	for those >16 WOA)		
Given	960(85.8)	727(71.3)	<0.001
Not given	159(14.2)	292(28.7)	
All mothers had HIV used	tests, abdominal palpation, oed	ema check, iron/folio	supply and
a mosquito net.			

IPT=intermittent preventive treatment, N=number, %=percentage

In this study, we observed that there was a significant difference in listening to the fetal heart for those mothers above 22 weeks and administration of IPT for those mothers above 16 weeks. Thepercentage of mothers in whom fetal heart listening https://www.inosr.net/inosr-applied-sciences/ Abeza INOSR APPLIED SCIENCES 10(3):84-94, 2023 was not done was higher in the 2020 period (2.0% vs. 0.0%, p<0.001). The percentage of mothers above 16 weeks

who didn't receive IPT was more in the 2020 period as well (28.7% vs. 14.2%, p<0.001).

Comparison of the challenges faced by antenatal care service providers at KIU-TH between 2019 and 2020



Figure 3: Showing the new challenges faced during the 2020 period of COVID-19 that werenot experienced in the 2019 period

According to the rota, only 4 health workers were allocated to the antenatal care clinic during theMarch to May period in both 2019 and 2020 and all 4 filled the questionnaire. The in-charge also responded to the questionnaire making

Percentage change in the number of mothers attending antenatal care at KIU-TH between 2019 and 2020

This study showed that there was a 7.1% reduction in the number of antenatal visits during the Covid-19 lockdown period. Our findings are in agreement with a global observation by [13] who reported that there was a widespread perception of reduced use of routine maternity care services, though the specific percentage reduction was not reported by Semaan et al. Also, in agreement with our findings is what was reported at Kawempe division of Mulago

the total number of respondents five. The commonest challenges faced were failure to get transport means, fear of contracting COVID-19 and too much work and exhaustion. These 3 challenges were reported by 100% (5) of the respondents.

DISCUSSION

national referral hospital, during the 3 Months lockdown where the number of antenatal attendances significantly decreased and remained below pre-COVID levels (370 fewer/month) [10]. Though other studies reported that antenatal care service utilization had decreased during COVID-19 period, the percentage reductions were not reported as was done in our study. This reduction in attendance can be attributed to the lockdown which was in effect at the period, and all the associated occurrences that were seen during the lock down period like bans on public and private

INOSR APPLIED SCIENCES 10(3):84-94, 2023 transport, closure of businesses hence loss of income among others.

Comparison of the services offered to mothers receiving antenatal care at KIU-TH between 2019 and 2020

In this study, we observed that there was a significant difference in listening to the fetal heart for those mothers above 22 weeks and administration of IPT for those mothers above 16 weeks. Thepercentage of mothers above 22 weeks of amnorrhea in whom fetal heart listening was not done was more in the 2020 period (2.0% vs 0.0%, p<0.001). The percentage of mothers above 16 weeks that didn't receive IPT was more in the 2020 period as well (28.7% vs 14.2%, p<0.001). Our findings related with what was reported in the UK where practice changes in some settings included reduction in personal contacts for tests and treatments [17]. This reduction of contact in fear of contracting COVID-19 could be the reason why a proportion of mothers above 22 weeks of amenorrhea did not have their fetal hearts listened to, yet in the year 2019, all mothers had the fetal heart listened to. Our findings also relate with what was reported in Ethiopia where 114 (29.3%) pregnant women had fully utilized care services during the antenatal pandemic period [18]; meaning 70.7% did not fully utilize the antenatal acre services. However, in the Ethiopia study, the services not attained were not reported. The bigger proportion of mothers not receiving IPT could be explained by stock outs as reported in Mulago by [10] who observed that several shortages were noted in medication and availabilitv vaccination both prelockdown and post-lockdown, which may have affected the ability to deliver effective services during the period of the pandemic. Though other studies reported

The percentage of mothers attending antenatal care was reduced in the COVID-19 period.

The services that were significantly affected in the COVID-19 period were fetal heart auscultation and the administration of intermittent preventive treatment for malaria. The challenges faced while that there was an interruption of antenatal care services, they did not specify which services were affected and the extent to which they were affected as was done in this study.

Comparison of the challenges faced by antenatal care service providers at KIU-TH between 2019 and 2020

The commonest challenges faced were failure to get transport means, fear of contracting COVID-19 and too much work and exhaustion. These 3 challenges were reported by 100% of the respondents. The other challenges included failure to connect with patients, suffocation caused byputting on masks for long, inadequate personal protective equipment and pressure to learn new technology. Our findings are in agreement with what was reported by [19] in Indonesia where midwives reported that increased workload was one of the challenges faced in offering antenatal care to mothers during the COVID-19 period. Also as was seen in Australia, concern about their own and family's health and safety in relation to COVID-19 was one of the challenges faced in the COVID period in our study [20]. Our findings are also in agreement with what was reported in Nigeria, where it was reported that movement and cost barriers significantly affected antenatal care during the COVID period [21-24].

Strength of the study

This was the first study that compared specific services offered between the pre-COVID period and the COVID lockdown period. Also, this study objectively reported the reduction in antenatal care utilization by reporting the percentage reduction. This study had a big sample size for antenatal care clients (2379) hence the findings can be generalized with minimal error.

CONCLUSION

offering antenatal care during the COVID-19 period included; failureto get transport means, fear of contracting COVID-19, too much work and exhaustion, failure to connect with patients, suffocation caused by putting on masks for long, inadequate personal protective equipment and pressure to learn new technology.

INOSR APPLIED SCIENCES 10(3):84-94, 2023 Recommendation

Preparedness for outbreaks and disasters should be put in place such that when such outbreaks occur again, antenatal care will not be affected as was seen in this period. In the setting of outbreaks, measures should be put in place to ensure that antenatal services can be offered appropriately and safelv without compromising the client or the healthcare

- Esegbona-adeigbe, S. (2020). Impact 1. of COVID-19 on antenatal care 4(April), provision. 4-5. https://doi.org/10.35500/jghs.2020. 2.e4.
- 2. Brad, Z., Hauck, Y., Homer, C. S. E., Sweet, L., Wilson, A. N., Szabo, R. A., Wynter, K., Vasilevski, V., & Kuliukas, L. (2020). Midwives' experiences of providing maternity care during the COVID-19 pandemic in Australia. Ianuary.
- Fasano, G., Bennardo, L., Ruffolo, S., 3. Passante, M., Ambrosio, A. G., Napolitano, M., Provenzano, E., Paul, S., & Patruno, C. (2022). Erythema Migrans-like COVID Vaccine Arm: A Literature Review.
- 4. WHO, (2020), COVID-19 Public Health Emergency of International Concern (PHEIC). Global Research and Innovation Forum: Towards а Research Roadmap.
- Douglas, M. (2020). Mitigating the 5. wider health effects of covid-19 pandemic response. BMJ: British Medical Journal, 369.
- 6. Hogan, A. (2020). The potential impact of the COVID-19 epidemic on HIV, TB and Malaria inlow-and middleincome countries. Imp Coll Lond.
- 7. Tumwesigye, N. M., Denis, O., Kaakyo, M., & Biribawa, C. (2021). Effects of the COVID-19 Pandemic on Health Services and Mitigation Measures in Uganda Working Paper 571. March 2021. March 2021.
- 8. Umviligihozo, G., L, M., & Sonela N, et al. (2020). Sub-Saharan Africa preparedness and response to the COVID-19 pandemic: a perspective of early career African scientists. Open Res, 5, 163.

worker. There should be regular refresher training for health workers on how to offer antenatal care in the setting of outbreaks to ensure that when an outbreak occurs, they are well-prepared and well-equipped to deal with it. Also, enough PPE should be stocked since these should be used in infection control even for non-COVID infections.

- REFERENCES
 - Pallangyo, E., Nakate, M. G., & Maina 9. R, et al. (2020). The impact of COVID-19 on midwives' practice in Kenya, Uganda and Tanzania: a reflective account. Midwifery, 89, 102775.
 - 10. Burt, J. F., Ouma, J., Lubyayi, L., Amone, A., Aol, L., Sekikubo, M., Nakimuli, A., Nakabembe, E., Mboizi, R., Musoke, P., Kyohere, M., Lugolobi, E. N., Khalil, A., & Doare, K. Le. (2021). Indirect effects of COVID-19 on maternal. neonatal. child. sexual and reproductive health services in. July. https://doi.org/10.1136/bmjgh-2021-006102
 - 11. Faintuch, J., & Faintuch, S. (2019). Introduction to the Microbiome and Metabolome. In Microbiome and Metabolome in Diagnosis. Therapy. and Other Strategic Applications. Elsevier Inc. https://doi.org/10.1016/B978-0-12-815249-2.02001-7.
 - 12. Delamou, A., Ayadi, A., & Sidibe S, et al. (2017). Effect of Ebola virus disease on maternal andchild health services in Guinea: a retrospective observational cohort study. Lancet Glob Health, 5, 448-458.
 - 13. Semaan, A., Audet, C., Huysmans, E., Afolabi, B., Blencowe, H., Assarag, B., Banke-, A., Caluwaerts, S., Maeve, O., Campbell, R., Cavallaro, F. L., Chavane, L., Day, L. T., Delamou, A., Delvaux, T., Graham, W. J., Gon, G., Kascak, P., Matsui, M., & Radovich, E. (2020). Voices from the frontline: Findings from a thematic analysis of a rapid online global survey of newborn maternal and health professionals facing the COVID-19 pandemic.

https://doi.org/10.1136/bmjgh-

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- INOSR APPLIED SCIENCES 10(3):84-94, 2023 2020-002967.
- Szabo, R. A., Wilson, A. N., Homer, C., Vasilevski, V., Sweet, L., Wynter, K., Hauck, Y., Kuliukas, L., & Bradfield, Z. (2021). COVID-19 changes to maternity care: Experiences of Australian doctors. 408-415. https://doi.org/10.1111/ajo.13307.
- 15. UNICEF. (2017). Antenatal Care. Matern. Heal, 2017.
- Ogunkola, I. O., Adebisi, Y. A., Imo, U. F., Odey, G. O., Esu, E., & Iii, D. E. L. (2021). Public Health in Practice. Public Health in Practice, 2(December 2020), 100076. https://doi.org/10.1016/j.puhip.202 1.100076.
- 17. Horsch, A., Lalor, J., & Downe, S. (2020). Moral and mental health challenges faced by maternity staff during the Covid-19 pandemic. 2020. https://doi.org/10.1037/tra0000629
- Tadesse, E. (2020). Antenatal Care Service Utilization of Pregnant Women Attending Antenatal Care in Public Hospitals during the COVID-19 Pandemic Period. 1181-1188.
- 19. Hazfiarini, A., Akter, S., Homer, C. S. E., Islamiah, R., & Bohren, M. A. (2022). We are going into battle without appropriate armour: A qualitative study of Indonesian midwives' experiences in providing maternity care during the COVID-19 pandemic. Women and Birth, 35(5), 466-474. https://doi.org/10.1016/j.wombi.202 1.10.003.

- 20. Id, Z. B., Wynter, K., Hauck, Y., Vasilevski, V., Kuliukas, L., Wilson, A. N., Id, R. A. S., Homer, C. S. E., & Sweet, L. (2021). Experiences of receiving and providing maternity care during the COVID-19 pandemic in Australia: A five-cohort cross-sectional comparison. 1https://doi.org/10.1371/journal.pon e.0248488.
- 21. Leung, C., Olufunlayo, T., Olateju, Z., Macarthur, C., & Taylor, B. (2022). Perceptions and experiences of maternity care workers during COVID-19 pandemic in Lagos State, Nigeria; a qualitative study. BMC Health Services Research, 1–14. https://doi.org/10.1186/s12913-022-08009-y.
- 22. Deo, N. (2023). Evaluation of Factors that Influence High Morbidity Rate in Pregnant women Attending Antenatal Care at Kampala International University-Teaching Hospital (KIUTH), Bushenyi ... INOSR Experimental Sciences. 11(1), 99-1111.
- 23. Johnesm, B. (2023). Prevalence of Malaria among Pregnant Women Attending Antenatal Clinic at Ishaka Adventist Hospital, Uganda. 9(1), 59-67.
- 24. Johnesm, B. (2023). Assessment of Risk Factors in Antenatal Women at Ishaka Adventist Hospital, Uganda. IDOSR Journal of Experimental Sciences. 9(1), 50-58.

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