

Original Research Article

Factors that influence healthcare service utilization during COVID-19 pandemic among pregnant women and caregivers with children under two years in Rongo sub-county, Migori County, Kenya

Doreen Baraza Awino*, Wanja Mwaura-Tenambergen, Musa Oluoch

Department of Health Systems Management, Kenya Methodist University, Kenya

Received: 29 July 2021

Accepted: 13 August 2021

***Correspondence:**

Doreen Baraza Awino,

E-mail: daawino2016@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Health systems have failed in past epidemics to maintain delivery of routine health essential services. Most resources including human and essential supplies are all diverted to address health emergency, sometimes resulting in lack of important basic and routine health services.

Methods: This was a retrospective cross-sectional study with mixed data collection methods, where respondents were asked questions on how COVID-19 affected them with regard to utilization of MCH healthcare during the first peak of the COVID-19 in Kenya. Two high volume facilities were selected purposively based on volume and capacity of services offered. A random sample was drawn from the stratum using a list generated by community health workers (CHWs) attached to the health facilities. Key informant interviews were used to collect data among health care providers and structured questionnaire was used for pregnant women and caregivers. Independent variables, social distancing, social stigma, communication and human mobility restriction were associated with health care service utilization and significant at 0.05 p value.

Results: Correlation analysis indicated social stigma ($r=0.407$, $p<0.512$), social distancing ($r=0.324$, $p<0.001$) and human mobility restrictions ($r=0.606$, $p<0.001$) negatively influenced service utilization. Whereas COVID-19 related communication (0.631 , $p<0.001$) was protective and thus promoted service utilization. The hierarchical linear regression model explained 67.73% of the total variations in the health care service utilization, which was $r=0.6773$.

Conclusions: From the findings social stigma, communication, social distancing and human mobility restrictions influence health care service utilization. Ministry of health should strengthen targeted community outreaches for pregnant women and caregivers with children under two years.

Keywords: COVID-19, Health systems, Pregnant women, Caregivers, Communication, Social distancing, Social stigma and human mobility, Migori Kenya

INTRODUCTION

In December 2019 a rapidly communicable diseases erupted in the Chinese city of Wuhan. The virus causing the disease also known as severe acute coronavirus respiratory syndrome (SARS-CoV-2) belongs to the larger family of coronaviruses family. The extremely contagious virus has spread outside of China and has since become a global public health emergency.¹ The

pandemic response has impacted all child health, neonatal, maternal and reproductive programs and their use. Health staff, supplies and services are reassigned during the pandemic to tackle the surge of COVID-19-patients.² Realignment of the healthcare delivery system may contribute in the closure of local health facilities as experienced in the 2014 ebola virus outbreak.³ Infection and burnout from nosocomial COVID-19 has also reduced the health workforce.⁴ Reproductive, maternal,

nutrition and child health (RMNCH) services delivered by programs such as vaccines, bed nets or vitamin A are either stopped or decreased in scope.⁵

Health systems have failed in past epidemics to maintain routine essential services in health.⁶ Globally, according to analysis of 77 COHORT studies published in September 2020 the odds of pregnant women with a COVID-19 diagnosis being admitted to the intensive care unit (ICU) were 62% higher than for non-pregnant women of reproductive age.⁷ Because of their vulnerability the influencers of the infection among the pregnant women are critical and must be understood and addressed.

While efforts in Kenya have been effective so far and have slowed down the community's rate of SARS-COV-2 transmission, unfortunately they have come up with a different set of challenges, which included suspension of elective surgery, imposed night curfew by the government, disruption of routine health services including immunization and antenatal clinics, diversion of human capital and supplies to tackle the COVID-19 pandemic, loss of income which could limit access to the health services.⁸ In Migori county, the number of women seeking ANC services decreased from 63% in 2019 to 55% in the year 2020. Utilization for FP services also dropped from 58.2% to 52.7 % in the same period.⁸ The drop has also been observed in access for family planning services, owing in part to supply chain instability causing stock-outs. There was an overall decline in utilization of health services in Rongo sub-county hospital in April and May 2020 as shown in (Table 1).⁹

METHODS

Study design and study site

This was a retrospective cross-sectional study design with mixed data collection methods. The study was conducted in Rongo sub-county in Migori county, Kenya. There were 10 (9 government owned and 1 faith-based) healthcare facilities in Rongo sub-county.¹⁰

Study sample

The target population included 6,929 pregnant women and mothers or caregivers with children who were under 2 years, in Rongo sub-county. The study sample was 364 respondents and 34 key informants. The study respondents were pregnant women and mothers or caregivers who had missed their MCH appointments during the months of April-August 2020, who were 18 years and above and were residents of Rongo-sub county for at least over 12 months. Two high volume facilities were selected purposively based on volume and capacity of services offered. A random sample was drawn from the stratum using a list of missed appointment by pregnant women and caregivers generated by CHWs attached to the health facilities. Key informants were selected from among healthcare providers.

Data collection and analysis

A structured questionnaire was used to collect quantitative data from the selected pregnant women and caregivers respondents and a key informant interview guide was used to collect qualitative data among key informants. Data was collected in October and November 2020. The data collection tool was pre-tested where the reliability Cronbach's alpha co-efficient results were >0.75. SPSS version 24 was used to analyze quantitative data. Chi-square test was used to test for significance at p value 0.05. Correlation was used to test for association while hierarchical linear regression was used to determine the best predictor variable for independent variables; social distancing, social stigma, communication and human mobility restriction were associated with utilization of health care services. The study conceptual framework is shown as Figure 1.

RESULTS

The study included 364 were pregnant women or mothers/caregivers with children under 2 years (Table 1). Most of the respondents 280 (76.92%) were married, 150 (41.21%) had secondary level of education, 126 (34.62%) were engaged in small businesses and 213 (58.52 %) used motorbikes as their mode of transport to the health facility.

The study findings revealed that out of 364 respondents most 226 (62%) did not utilize health services at all and 138 (38%) had partially missed some of the health care services when needed due to COVID-19 restrictions. Social stigma attributes were assessed by three constructs personal-based, community-based and facility-based stigma (Table 2). Most respondents 269 (73.9%) indicated that health personnel often treated people with suspicion when they sought healthcare services, 342 (93%) felt discriminated when screened before entering the health facility and 276 (75.8%) stated that their community would discriminate them for visiting health facilities during COVID-19. Majority of the respondents indicated that personal, community and facility-based stigma played a role as deterrent to utilization of healthcare services. A key informant, 001, female, nurse had the following to say:

“As a health officer, I was afraid of contracting the disease and this changed how I offer services and interact with clients. Patients also failed to visit ANC clinics due to fear of being suspected of having COVID-19 by health care providers.”

The study sought to find out the influence of communication about COVID-19 preventive measures on healthcare services utilization. Most respondents 225 (61.2%) and 265 (72.8%) perceived the campaign messages as relevant and that the daily data reports from the ministry of health (MoH) had positive influence on their health seeking behaviour respectively. Other results

are shown in Table 3. On KII key informant, 004, male, CHW said:

“Many people that receive the educational messages on COVID-19 came to seek health care services despite the fear that was there.”

The parameters of social distancing were analysed in terms of household social distancing, community social distancing and facility social distancing (Table 4). Over half 215 (59.1%) of the respondents agreed that CHWs made visits for community-facility referrals, 234 (64.3%) confirmed that there was restriction on the number of passengers a vehicle could carry and this increased the

transport costs and this had an effect on utilization of healthcare services. This also would imply that this containment measure would help to lower the rate of COVID-19 transmission. However, this contradicted the observation made by key informants as several of them reported that patients did not seek care in facilities because of the new measures introduced at facilities such as screening and wearing of masks. A KII, 10, female public health officer said:

“Social distancing, mandatory wearing of mask and screening makes others feel stigmatized making them not to come to the facility.”

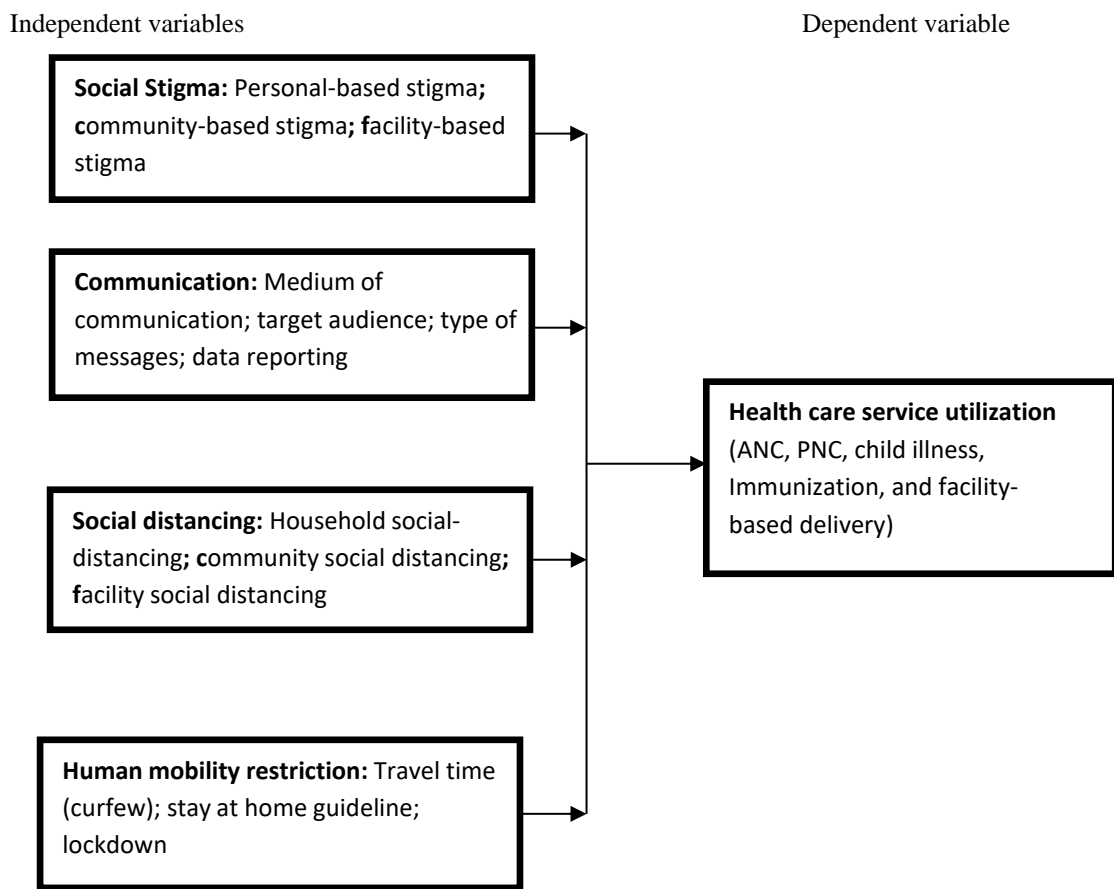


Figure 1: Conceptual framework.

Table 1: Socio-demographic characteristics of caregivers (N= 364).

Variables	Categories	Frequency	%
Marital status	Divorced	2	1
	Married	280	77
	Separated	7	2
	Single	66	18
	Widowed	9	2
Occupation	Farmer	80	22
	House wife	76	21
	None	3	1
	Paid employee	26	7

Continued.

Variables	Categories	Frequency	%
	Small business	126	35
	Student	45	12
	Unemployed	8	2
Husband occupation	Farmer	70	19
	None	87	24
	Paid employee	65	18
	Small business	126	35
	Student	5	1
	Unemployed	11	3
Level of education	College	72	20
	Non-formal	9	2
	Primary	133	37
	Secondary	150	41
Husband level of education	College	77	21
	Non-formal	1	1
	None	84	23
	Primary	90	25
	Secondary	112	30
Mode of transport	Motorbike	213	59
	Public transport	36	10
	Walking	115	32
Treatment place	Private	212	58
	Public	152	42
Type of services received	In-patient	33	9
	Outpatient	331	91
Source of information	Print media	18	5
	Radio	157	43
	Social media	72	20
	Television	117	32

Table 2: Social stigma surrounding COVID-19 and utilization of healthcare services.

Description variables	Yes, N (%)	No, N (%)	Chi-square	P value
Personal-based stigma				
I am always afraid that I will get COVID-19 when I seek health services from health workers	186 (51.1)	178 (48.9)	47.61	0.0001
I cannot live or work close to someone who has recovered from COVID-19	183 (50.2)	181 (49.8)	60.84	0.0001
I dread the thought that I could become a COVID-19 patient	249 (68.4)	115 (31.6)	84.64	0.0001
I won't let people know if there is a person with COVID-19 in my family	267 (73.4)	97 (26.6)	59.29	0.0001
Community-based stigma				
The community will discriminate me for visiting health facilities during COVID-19	276 (75.8)	88 (24.2)	77.44	0.0001
My neighbours are often speaking negatively of people who seek health services during this time of COVID-19	222 (60.9)	142 (39.1)	68.89	0.0001
People with COVID-19 should not be allowed to remain in their homes	162 (44.5)	202 (55.5)	65.61	0.0001
Facility-based stigma				
Health facilities is where people are getting COVID-19	235 (64.6)	129 (35.4)	51.84	0.0001
I often afraid of visiting health facilities during this period of COVID-19	236 (64.8)	128 (35.2)	96.04	0.0001
The health personnel often treat people with suspicion when you seek health care services	269 (73.9)	95 (26.1)	88.36	0.0001
I always feel discriminated when screened before entering the health facility	342 (93.9)	22 (6.1)	98.01	0.0001

Table 3: Communication of COVID-19 preventive measures and healthcare services utilization.

COVID-19 related communication	Yes, N (%)	No, N (%)	Chi-square	P value
Medium of communication				
Messaging from campaigns are not relevant to me	139 (38.8)	225 (61.2)	44.89	0.0001
Most mainstream media are not reliable	138 (37.9)	226 (62.1)	77.44	0.0001
There is a lot of misinformation on social media	205 (56.3)	159 (43.7)	68.89	0.0001
Type of message				
People were discouraged from visiting health facilities	135 (37.1)	229 (62.9)	96.04	0.0001
Data reporting				
Daily data reports from MoH have negatively impacted my health seeking behaviour	99 (27.2)	265 (72.8)	92.16	0.0001

Table 4: Social distancing COVID-19 preventive measures and healthcare services utilization.

COVID-19 related social distancing	Yes, N (%)	No, N (%)	Chi-square	P value
CHW house hold visits for community-facility referrals	215 (59.1)	149 (40.9)	53.29	0.0001
Restriction of number of people in vehicles	234 (64.3)	130 (35.7)	67.24	0.0001
Community based social distancing during facility outreach	270 (74.2)	94 (25.8)	57.76	0.0001
Halting of non-essential services and reducing of crowding in facilities	242 (66.5)	122 (33.5)	94.09	0.0001
Mandatory wearing of mask and keeping 2 meters at each service point in health facilities	203 (55.8)	161 (44.2)	46.24	0.0001

Table 5: Human mobility restrictions of COVID-19 preventive measures and healthcare services utilization.

COVID-19 related human mobility restrictions	Yes, N (%)	No, N (%)	Chi-square	P value
No movement past restricted hours	248 (68.1)	116 (31.9)	53.29	0.0001
Stay at home directive when feeling mild illness	113 (31.0)	251 (69.0)	90.25	0.0001
Closure of borders and movement in between areas and counties	325 (89.3)	39 (10.7)	88.36	0.0001

Table 6: Summary of bivariate analysis results.

Results		Utilisation of healthcare	Social stigma	Communication	Social distancing	Human mobility
Utilisation of healthcare	Pearson correlation	1.000				
	Sig. (2-tailed)					
	N	364				
Social stigma	Pearson correlation	-0.407	1.000			
	Sig. (2-tailed)	0.512				
	N	364	364			
Communication	Pearson correlation	0.631**	0.482*	1.000		
	Sig. (2-tailed)	0.0001	0.068			
	N	364	364	364		
Social distancing	Pearson correlation	-0.314**	-0.574*	-0.602**	1.000	
	Sig. (2-tailed)	0.0001	0.076	0.0001		
	N	364	364	364	364	
Human mobility	Pearson correlation	-0.606**	-0.064	-0.662**	-0.589**	1.000
	Sig. (2-tailed)	0.001	0.526	0.0001	0.0001	
	N	364	364	364	364	364

**Correlation is significant at the 0.01 level (2-tailed); *correlation is significant at the 0.05 level (2-tailed).

Table 9: Regression weights for healthcare services utilisation.

Utilisation		Unstandardized Coefficients		Coefficients standardized coefficients		
		B	Std. Error	Beta	t	Sig.
Model 1	(Constant)	0.045	0.068		0.031	0.128
	Social stigma_	-0.037	0.023	-0.029	0.691	0.0001
	Communication	0.086	0.017	0.077	2.753	0.0001
	Social distancing	-0.052	0.019	-0.046	3.201	0.0001
	Human mobility restrictions	-0.054	0.032	-0.038	4.702	0.0001

Dependent variable: healthcare services utilisation.

The influence of human mobility restrictions of COVID-19 preventive measures on utilization of health care services revealed that 325 (89.3%) respondents confirmed the closure of borders and restricted movements affected emergency services were affected especially for cross county referrals (Table 5). A COVID-19 test was required before a patient was attended to resulting in delays. Majority 248 (68.1%) of the respondents confirmed that there were no movement past restricted hours. This could have restricted patients specifically for pregnant women and mother or caregivers with children <2 years who might require emergency medical care. A KII, 09, male, nurse said:

“Patients fear to go to the health facility past curfew hours for fear of being arrested. It is also almost impossible for patients to get referrals during curfew hours. This has led to more deaths and severe sickness in most patient.”

Results on bivariate correlation analysis to determine the relationship between the independent and dependent variables are shown in Table 6. Finding show that social stigma and utilisation of healthcare services had a negative association, ($r=-0.407$, $p>0.05$), but it was not scientifically significant. It implied that when social stigma surrounding COVID-19 escalated in the community, then there was a lower chance of pregnant women and caregivers with children under 2 years seeking healthcare services. Communication of COVID-19 preventive measures had a positive and scientific significant correlation with healthcare utilisation as represented by ($r=0.631$, $p<0.001$). This implied that the mode of communication, type of message and data reporting concerning COVID-19 had a positive influence on utilization of healthcare services among the respondents. Social distancing was established to have a negative correlation and scientific significant with the utilisation of healthcare services ($r=-0.314$, $p<0.001$). This implied that the more the government urged households and communities to observe social distancing the lower the number of pregnant women and mother or caregivers with children below the age of two years old utilized of healthcare services during the first peak of COVID-19 pandemic. The restrictions of human mobility

showed a negative correlate and scientific significant at $r=-0.606$, $p>0.0001$ with utilization of healthcare services among pregnant women and mother or caregivers with children under 2 years. This means that the impact of travel time (curfew), stay at home and lockdown has significantly derailed the uptake of healthcare services. Pregnant women and mothers with babies below two years have found a lot of difficulty in accessing healthcare during these times of movement restrictions. Some of them have resorted to staying at home, even at the time when they require urgent medical attention.

Regression results revealed that 61% of the total variations in the utilization of healthcare services by pregnant women and mother or caregivers with children under 2 years can be explained by variability in four factors in this study (Table 7). A multiple regression analysis was done on the four independent variables of social stigma, communication, social distancing and mobility restrictions to test their combine influence on utilization of healthcare services (Table 8). The assessment model can be presented as follows,

$$\text{Utilization (Y)} = 0.000 + 0.029X_1 + 0.077X_2 - 0.046X_3 + 0.038X_4.$$

The regression outputs showed that all the four variables were valid $F(4,299)=76.402$, $p<0.05$). The results on social stigma (X_1 , $\beta_1=-0.029$, $p=0.001$), social distancing (X_3 , $\beta_3=-0.046$, $p=0.001$) and human mobility restrictions (X_4 , $\beta_4=-0.038$, $p=0.001$) means that a unit change in the three variables will reduce the utilisation of healthcare services among pregnant women and mothers or caregivers with children under 2 years. Improvement in communication would lead to an increase in utilization of healthcare services utilisation.

DISCUSSION

Social stigma surrounding COVID-19 was a barrier to utilization of healthcare services during the COVID-19 pandemic. The findings were similar to the observation made by Yousefi et al in China where utilization of both inpatient and outpatient healthcare services declined significantly after the SARS-CoV-2 outbreak, likely due

to changes in patient and provider behaviours, suspension of health facilities or their non-emergency services, massive mobility restrictions and the potential reduction in the risk of non-SARS-COV-2 diseases.¹¹ A study in Nepal by Singh et al showed that most participants shared their experience of being worried and anxious about COVID-19 and reported a lack of awareness, misinformation and stigma as major factors contributing to the spread of COVID-19.¹² Maternity services, immunization and supply of essential medicine were found to be the most affected areas of health care delivery during the lockdown.

The findings concur with Brandt et al assertion that stigma had been correlated with inadequate rates of awareness as well as fear of casual communication in the workplace.¹³ The results from this study agreed with Li et al and Corrigan et al who reported that fear has caused harm to people seeking health services.^{14,15} Ahmed et al observed that due to COVID-19 resulted in reduction in access to healthcare services among slum dweller, including preventive services.¹ He further alluded that there was fear of being diagnosed with COVID-19 that discouraged healthcare seeking. The stigma was widespread, UNAIDS 2020 report on stigmatization on healthcare recommends how to reduce the stigma to individual diagnosed with COVID-19 health care works and those seeking health services.

MoH daily reports have kept people well updated with COVID-19 infections and prevention measures. Study findings contradict Tasnim et al claimed that the pervasive confusion associated with the management and therapy of COVID-19 had frustrated the general public as well as the health care professionals who are dealing with a fairly under-researched disease.¹⁶

Social distance measures were implemented worldwide.¹⁷ Social distancing along with other public health interventions could reduce the morbidity and mortality of COVID-19 to some degrees and it was crucial in the control the pandemic.¹¹ The same results were reported by Oladipo et al in Kenya informal settlement who estimated that control measures reduced physical contacts by 62% and non-physical contacts by either 63% or 67%, depending on the pre-COVID-19 comparison matrix used.¹⁸ This mitigation, however, had a negative influence on access to and quality of care.

The closure of borders hampered the movement of people including patients who might seek healthcare services from neighbouring areas, which have since then been closed. The impact of lockdown on healthcare utilisation was likely to be severe as those seeking healthcare from areas under lockdown might find it difficult to access and received the services they required.¹⁹ This might be restrictive, specifically for pregnant women and caregivers with babies below age 2 year old who might require emergency medical care at certain facilities.²⁰ The results were related to findings by Kotlar et al who

observed that tight movement restrictions introduced around the world to curb the spread of the novel coronavirus disease have had far-reaching consequences more especially on access to healthcare.²¹ The results are also similar to Robertson et al observations that women have experienced difficulty in finding transportation to health facilities when starting labour as well as physical and verbal police abuse for going to health facilities past curfew hours.²²

CONCLUSION

Social stigma and social distancing measures surrounding COVID-19 has led to reduction in health seeking behaviour in health facilities in Rongo sub-county. The Migori county department of health care should sensitize the community through CHW and digital platform to continue using healthcare services while observing COVID-19 preventive measures. The human mobility restrictions and curfew orders have negatively influenced the uptake of healthcare services. The ministry of health and Migori county government should work more closely with security agencies to sensitize them and ensure ease of access by patients and clients who need urgent and/or essential healthcare services particularly after curfew hours.

ACKNOWLEDGEMENTS

The authors would like to thank staff of Lwala community alliance and the women and caregivers who agreed to be part of the research.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Ahmed SA, Ajisola M, Azeem K, Bakibinga P, Chen YF, Choudhury NN, et al. Impact of the societal response to COVID-19 on access to healthcare for non-COVID-19 health issues in slum communities of Bangladesh, Kenya, Nigeria and Pakistan: results of pre-COVID and COVID-19 lockdown stakeholder engagements. *BMJ Global Health*. 2020;5(8):003042.
2. Allotey J, Stallings E, Bonet M, Yap M, Chatterjee S, Kew T, et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. *BMJ*. 2020;370:3320.
3. Burdorf A, Porru F, Rugulies R. The COVID-19 (Coronavirus) pandemic: consequences for occupational health. *Scandinav J Work Environment Health*. 2020;46(3):229-30.
4. Ribacke KJB, Saulnier DD, Eriksson A, Schreeb JV. Effects of the West Africa ebola virus disease on

- health-care utilization-a systematic review. *Frontiers in public health*. 2016;4:222.
5. Ramaci T, Barattucci M, Ledda C, Rapisarda V. Social stigma during COVID-19 and its impact on HCWs outcomes. 2020;12(9):3834.
 6. WHO. Fact sheet: Social Stigma associated with COVID-19: a guide to preventing and addressing, 2020. Available at: [https://www.unicef.org/media/65931/file/Socialstigma associated with the coronavirus disease 2019 \(COVID-19\).pdf](https://www.unicef.org/media/65931/file/Socialstigma%20associated%20with%20the%20coronavirus%20disease%202019%20(COVID-19).pdf). Accessed on 13 July 2021.
 7. Anderson RM, Heesterbeek H, Klinkenberg D, Hollingsworth TD. How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet*. 2020;395(10228):931-4.
 8. Lin CY. Social reaction toward the 2019 novel coronavirus (COVID-19). *Social Health Behavior*. 2020;3(1):1.
 9. Ministry of Health Kenya. COVID-19 Update Report. (2021). <https://www.health.go.ke>
 10. Kenya Ministry of Health. Fact sheet: Kenya master health facility list, 2020. Available at: <http://kmhfl.health.go.ke/>. Accessed on 13 July 2020.
 11. Afrashteh MY. The relationship between coping self-efficacy and social support with psychological well-being in pregnant women referring to health centers during the coronavirus outbreak. *Preventive Care Nursing Midwife J*. 2021;11(3):9-17.
 12. Singh AK, Singh R, Joshi SR, Misra A. Mucormycosis in COVID-19: a systematic review of cases reported worldwide and in India. *Diabet Metabol Syndrom Clinical Res Rev*. 2021.
 13. Brandt L, Sharp AC, Gardner D. A qualitative examination of teacher practices on student motivation. *Utah Valley Univ*. 2016.
 14. Li YC, Bai WZ, Hashikawa T. The neuroinvasive potential of SARS-CoV2 may play a role in the respiratory failure of COVID-19 patients. *J Med Virol*. 2020;92(6):552-5.
 15. Corrigan PW, Watson AC. The paradox of self-stigma and mental illness. *Clinic Psychol Sci Pract*. 2002;9(1):35.
 16. Tasnim S, Hossain MM, Mazumder H. Impact of rumors and misinformation on COVID-19 in social media. *J Prevent Med Public Health*. 2020;53(3):171-4.
 17. Zhao X, Rafiq A, Hummel R, Fei DY, Merrell RC. Integration of information technology, wireless networks, and personal digital assistants for triage and casualty. *Telemed J e-Health*. 2006;12(4):466-74.
 18. Oladipo JA. Utilization of health care services in rural and urban areas: a determinant factor in planning and managing health care delivery systems. *Afr Health Sci*. 2014;14(2):322-33.
 19. Pakpour AH, Griffiths MD, Chang KC, Chen YP, Kuo YJ, Lin CY. Assessing the fear of COVID-19 among different populations: a response to Ransing. *Brain Behavior Immun*. 2020;89:524-5.
 20. Kujariningrum OB, Wulandari RL, Fathurohman A, Pakpahan VE, Rahmawati D, Sistikawati HI, et al. Community Compliance to Physical Distancing, Clean and Healthy Lifestyle, and Healthy Protocol during COVID-19 Pandemic. 2021.24141.
 21. Kotlar B, Gerson E, Petrillo S, Langer A, Tiemeier H. The impact of the COVID-19 pandemic on maternal and perinatal health: a scoping review. *Reproduct Health*. 2021;18(1):1-39.
 22. Robertson T, Carter ED, Chou VB, Stegmuller AR, Jackson BD, Tam Y, et al. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study. *Lancet Global Health*. 2020;8(7):901-8.

Cite this article as: Awino DB, Mwaura-Tenambergen W, Oluoch M. Factors that influence healthcare service utilization during COVID-19 pandemic among pregnant women and caregivers with children under two years in Rongo sub-county, Migori County, Kenya. *Int J Community Med Public Health* 2021;8:xxx-xx.