Maternal health care services utilization in the amid of COVID-19 pandemic in West Shoa Zone, Central Ethiopia

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Abstract

The novel coronavirus (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Despite strong efforts that have been taking place to control the pandemic globally, the virus is on the rise in many countries. Hence, this study assessed the maternal health care services utilization in the amid of the COVID-19 pandemic in West Shoa Zone, Central Ethiopia. Community-based cross-sectional study was conducted among 844 pregnant women or those gave birth in the last 6 months before the study. A multi-stage sampling technique was used to select the study participants. The data were collected through face-to-face interview using a semi-structured questionnaire. Logistic regressions were performed to identify the presence of significant associations, and adjusted odds ratio with 95%CI was employed for the strength and directions of association between the independent and outcome variables. A P-value of <0.05 was used to declare statistical significance. The prevalence of maternal health service utilization during the COVID-19 pandemic was 64.8%. The odds of maternal health service utilization was higher among mothers who had primary (AOR=2.16, 95%CI: 1.29-3.60), secondary (AOR=1.97, 95%CI: 1.13-3.44), and college and above education (AOR=2.89, 95%CI: 1.34-6.22) than those who could not read and write. In addition, mothers who did travel 25-74 km (AOR= 0.37, 95%CI: 0.23-0.59) and 75-99 km (AOR= 0.10, 95%CI: 0.05-0.19) to reach health facility had a lower odds of maternal health service utilization than those who did travel < 24 km. Moreover, mothers who earn 1000-2000 (AOR= 3.10, 95%CI: 1.73-5.55) and > 2000 birr (AOR=2.66 95%CI: 1.52-4.64) had higher odds of maternal health service utilization than those who earn <500 birr. Similarly, the odds of utilizing maternal health service were higher among mothers who did not fear COVID-19 infection (AOR= 2.79, 95%CI: 1.85-4.20), who had not had to

40   request permission from husband to visit the health facility (AOR= 7.24, 95%CI: 2.65-19.75),

41   who had practiced COVID-19 prevention measure (AOR=5.82, 95%CI: 3.87-8.75), and used

42   face mask (AOR= 2.06, 95% CI: 1.28-3.31) than their counterpart. Empowering mothers and

43   creating awareness on the COVID-19 prevention is recommended to improve maternal health

44   service utilization during the COVID-19 pandemic.

45   **Keywords**: COVID-19, maternal health service utilization, West Shoa

Introduction

47   The novel coronavirus is a virus causing respiratory illness, commonly known as COVID-19 first

48   noted in December 2019 in Wuhan, China, and has since then spread to countries in the world

49   [1]. The World Health Organization (WHO) has declared the virus outbreak as a global

50   pandemic on March 11, 2020 [2]. As of September 14, 2020, the virus has infected more than 28

51   million and killed more than 900,000 people [3]. Africa contributes 4% of infection (more than 1

52   million) and 3% deaths (more than 23,000) [3]. The WHO classifies maternal health services

53   into: antenatal care (ANC), delivery services, and postnatal care, as essential health services to

54   continue during the COVID-19 pandemics [4, 5].

55   The maternal deaths were predicted to rise by 17% in the best-scenario and 43% in the case of

56   the worst scenario due to the COVID-19 pandemics [6]. Movement restrictions, transport

57   challenges, and anxiety over possibly being exposed to coronavirus are acting as the barrier to

58   maternal health service utilization [6, 7]. The ongoing COVID-19 has affected the perceptions

59   of pregnant women; more than half of the participants in a study done in Naples hospital reported

60   the psychological impact of COVID-19 as severe, and a similar number of pregnant women to

61   worry of vertical transmission of the infection [7]. Strained health care systems, disruptions in

62   care, and redirected resources might result in non-pandemic-related maternal morbidity and

63   mortality and reproductive health crisis which are particularly true for African countries

64   including Ethiopia with low-resource health systems [6, 8]. Obstetric healthcare providers may

65   not be able to provide the highest quality care during the COVID-19 pandemic with essential

66   precautions in place, client-provider communication is severely affected and the time to get the

67   care needed may take longer as health workers try to protect themselves from the infection [9].

68   The International Confederation of Midwives and the Royal College of Midwives support

69   community birth (home birth) for healthy women if there are appropriate midwife staffing and

70   referrals are facilitated in obstetric emergencies, where these are not available, it may be

71   necessary to modify available services, seeking at all times to maximize the provision of safe and

72   positive birth experience to all women [4]. Ethiopia's midwives grapple with COVID-19 while

73   ensuring safe delivery, and maternal health workers reported that COVID-19 travel restrictions

74   in Ethiopia are forcing pregnant women to give birth at home [8]. Maternity services in low

75   resource countries are adapting to provide antenatal, delivery, and postnatal care amidst a rapidly

76   shifting health system environment due to the COVID-19 pandemic [10]. Economic despair due

77   to lost jobs, limited care, and restricted health services, overburdened health systems, restricted

78   travel, and changing priorities at the primary care level are some of the burdens women had to

79   face during the pandemic [11].

80   Many efforts have been taking place to enhance maternal health service utilization including

81   information, education, and communication to raise awareness regarding the protection of

82   mother and child during COVID-19, some countries have tried to open temporary birth centers,

83 help hotlines virtual consultation with obstetricians have been provided via telemedicine

84 services, to women seeking maternal health care service [6]. There is a consensus that the use of

85 maternal health care services reduces maternal and child mortality and improves the reproductive

86 health of women (12). Family planning, ANC, use of skilled delivery attendants, and PNC

87 services are maternal health services that can significantly reduce maternal morbidity and

88 mortality. Since the novel coronavirus (SARS-CoV-2) is new to humans, only limited scientific

89 evidence is available to identify the impact of the disease on maternal health service delivery and

90 utilization particularly in low resource settings such as Ethiopia. Accordingly, understanding the

91 factors that affect maternal health care services delivery and utilization amid the COVID-19

92 pandemic could help to design appropriate strategies and policies towards the improvement of

93 maternal health service provision and utilization. Thus, this study aimed to assess the maternal

94 health care services (ANC, delivery, and PNC) utilization in the amid of the COVID-19

95 pandemic in West Shoa Zone, central Ethiopia.

Materials and Methods

Study design, setting, and population

98 A community-based cross-sectional study was conducted among women who were pregnant and

99 those gave birth in the last 6 months of the study period in West Shoa Zone, central Ethiopia

100 from July 1 to July 30, 2020. West Shoa zone is one of the zones of the Oromia National

101 Regional state, its capital is located at114km distance to the western part of Addis Ababa, the

102 capital city of Ethiopia. Currently, this zone has a total population of 2.5 million with around 1.2

103 million men and 1.3 women living within an area of 14,788.78 square kilometers. There are

104 about 495,753 women of reproductive age and 100,283 mothers give births per year. West Shoa

105 zone has 23 districts with over 528 rural kebele and 58 urban kebele. Currently, there are 8

106 Hospitals, 92 health centers, and 528 health posts in the West Shoa Zone.

Sample size determination

108 The sample size was calculated using a single population proportion formula for the four

109 maternal health services (ANC, Institutional delivery, and PNC). After calculating the sample

110 size for the four maternal health services, the largest sample size was used as the overall sample

111 size of the study. The assumptions considered during sample size calculation includes; 95%

112 confidence interval, 5% the margin of error, and proportion of ANC visit 46% and proportion of

113 institutional delivery 29% [13], and the proportion of early PNC visit 47% [14] in West Shoa

114 zone from the previous study, and 10% non-response rate. The largest sample size calculated was

115 for the proportion of early PNC visit 47%, n = 383, and used as the overall sample size of the

116 study. The final sample size was 844 by considering 10 % non-response rate and the design

117 effect of 2.

Sampling techniques

119 A multi-stage stratified sampling technique was employed with strata of urban and rural kebele

120 in the district. Six districts were selected at the first stage by simple random sampling from a

121 total of 23 districts of West Shoa Zone. Then, kebele from the district was stratified into urban

122 and rural kebele. Accordingly, one kebele from the urban and two kebeles from rural were

123 enrolled from the selected districts by simple random sampling. Mothers who were pregnant or

124 gave birth in the last 6 months of the study were identified by doing a census in collaboration

125 with health extension workers through home to home visit. Then, number of the study population

126 was placed to each selected kebele using proportion to population size. After having the list of all

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127   women in each selected kebele, mothers were included using systematic random sampling

128   techniques every interval of four.

129   Data collection tools and quality controls

130   Data were collected using semi-structured questionnaire through face-to-face interviews. The

131   questionnaire was adapted from related literature and modified based on the objectives of the

132   study and the cultural context of the study setting [3-8, 10, 11]. The tool consists of socio-

133   demographic characteristics, maternal health care services amid COVID-19 pandemic (ANC,

134   institutional delivery, and PNC) utilization, and impact of governmental emergency states

135   (transport, distance, mask, and mandatory quarantine). Data collectors were 10 BSc health

136   professionals, with health officers, Nurse, and Midwifery educational background. Pregnant

137   mothers and those who gave birth in the last 6 months were identified first by using health

138   extension workers to get their frame in the community. Data quality was assured during

139   collection, coding, entry, and analysis. A two-days training was given for the data collectors and

140   supervisors before actual data collection. The collected data were reviewed and checked for

141   consistency, clarity; completeness, and accuracy throughout the data collection process by data

142   collectors and supervisors. Furthermore, the pretest was done among 5% of the sample and the

143   result was used to modify the tool.

144   Data processing and analysis

145   Collected data were cleaned and entered using Epi data version 4.6 and analyzed using SPSS

146   version 23. Descriptive statistics were employed using frequencies, percentages, and diagrams.

147   Both bivariable and multivariable logistic regressions were performed to identify the presence of

7

148   a significant association between independent variables and the dependent variable. Those

149   variables with p<0.2 in the bivariable analysis were considered for multivariable logistic

150   regression analysis. Hosmer and Lemeshow goodness of fit test was used to check model fitness

151   before running the final model. Finally, screened variables were fitted to the multivariable

152   logistic regression model through a backward stepwise method to reduce the effects of

153   cofounders and to identify the independent effects of each variable on the outcome variable. An

154   adjusted odds ratio for a 95% confidence interval was employed for the strength and directions

155   of association between independent variables and the outcome variables. A P-value of <0.05 was

156   used to declare statistical significance.

Operational Definitions

158   Maternal health service utilization was defined as; fully received ANC in line with their

159   gestational age, having institutional delivery, and any PNC visits during COVID-19. Those

160   maternal health care services utilization were assessed using yes or no questions.

Ethics statement

162   The ethical clearance was obtained from an ethical review committee of the college of medicine

163   and health sciences, Ambo University. A letter of support was submitted to each district health

164   office. Both written and verbal consent was obtained from each study subject before the data

165   collection process proceeded. During the data collection process, the data collectors had

166   informed each study participant about the objective and anticipated benefits of the research

167   project and the study participants were also informed of their full right to refuse, withdraw, or

168   completely reject part or all of their parts in the study.

8

Result

Socio-demographic and economic characteristics of the study participants

In this study, a total of 844 pregnant women and those who gave birth in the last 6 months were included; the response rate was 100%. Two hundred forty-two participants (28.7%) were between the age of 25-29 years and 320 (37.9%) of they had primary education. More than half, 467 (55.3%) of the participants' occupations were housewives (Table 1).

Table 1: Sociodemographic distribution of participants showing maternal health services in the amid of the COVID-19 pandemic in West Shoa Zone, Central Ethiopia, 2020 (n= 844)

Characteristics	Frequency	Percentage
Maternal age		
< 19 years	43	5.1
20-24 years	229	27.1
25-29 years	242	28.7
30-34 years	198	23.5
35-39 years	102	12.1
≥40 years	30	3.6
Marital status		
Married	812	96.2
Others*	32	3.8
Maternal education		
Cannot read and write	165	19.5
Primary education	320	37.9
Secondary education	243	28.8

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college and above	116	13.7
Place of Residence		
Urban	560	66.4
Rural	284	33.6
Estimated monthly income in birr		
< 500	159	18.8
500-1000	200	23.7
1000-2000	182	21.6
> 2000	303	35.9
Maternal occupation		
Housewife	467	55.3
Government employee	117	13.9
Self-employed	146	17.3
Student	51	6.0
Farmer	63	7.5
Husband occupation		
Government employee	222	27.5
Self-employed	291	36.1
Student	19	2.4
Farmer	275	34.1
Distance to the health facility		
≤24 km	531	62.9
25-74 km	168	19.9
75-99 km	115	13.6
≥100 km	30	3.6

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Obstetric characteristics of the study participants

180   Among the 844 participants, 329(39.0%) were prim gravid and 657(77.8%) of them had 1-5 deliveries

181   (parity) (Table 2).

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182   Table 2: Obstetric distribution of study participants to assess maternal health services utilization

183   in the amid of the COVID-19 pandemic in West Shoa Zone, Central Ethiopia, 2020 (n= 844)

Characteristics	Frequency	Percentage
Previous adverse pregnancy outcome		
Yes	165	19.5
No	679	80.5
Gravidity		
Prim gravida	329	39.0
2-4	468	55.5
≥5	47	5.6
Parity		
Null parity	165	19.5
1-4	657	77.8
≥5	22	2.6

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Awareness on COVID-19 modes of transmission and prevention mechanisms

186   Among 844 of the participants, 835(98.9%) of them responded that COVID-19 can transmit from person

187   to person and 230(27.3%) of them think they are at risk of getting the COVID-19 infection. Five hundred

188   fifty-three, 65.5% were practicing COVID-19 prevention measures that they had received from the

189   community (Table 3).

190   Table 3: COVID-19 related characteristics to assess maternal health service utilization

191   among pregnant women and gave birth in the last 6 months of the study period in West Shoa

192   Zone, Central Ethiopia, 2020 (n= 844)

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Characteristics	Frequency	Percentage
COVID-19 can transmit from person to person		
Yes	835	98.9
No	9	1.1
Handshaking with a person having the virus can transmit COVID-19		
Yes	812	96.2
No	32	3.8
Sitting nearby a person having the virus can transmit COVID-19		
Yes	554	65.6
No	290	34.4
Body fluid of a person having the virus can transmit COVID-19		
Yes	294	34.8
No	550	65.2
Cough of a person having the virus can transmit COVID-19		
Yes	639	75.7
No	205	24.3
Sexual intercourse with an infected person can transmit COVID-19		
Yes	25	3.0
No	819	97.0
At the risk of getting the COVID-19		
Yes	230	27.3
No	614	72.7
Confidence to protect from COVID-19		
Yes	763	90.4
No	81	9.6
Fear to visit the health facility		
Yes	481	57
No	363	43
Information about COVID-19 prevention		
Yes	579	68.6

No	265	31.4
Has sanitizer and/or alcohol		
Yes	191	22.6
No	653	77.4
Use of face mask		
Yes	609	77.2
No	235	27.8
Practicing COVID-19 prevention measures		
Yes	553	65.5
No	291	34.5
Request permission from the husband to visit the health facility (n=812)		
Yes	735	90.5
No	77	9.5
Media presence		
Yes	722	85.5
No	122	14.5

Reasons for not utilizing maternal health services

Among the 297 participants who did not utilize maternal health services, 109(36.5%) mention fear of getting COVID-19 while traveling to receive the service as a reason to not receive the service, and 96(32.3%) and 95 (32%) gave fear of COVID-19 transmission from health care providers and lack of sanitizer or water in a health facility as a reason not to utilize the maternal health services respectively (Fig 1).

Fig 1. **Reasons for not using maternal health service utilization during COVID-19, West Shoa Zone, central Ethiopia, 2020**

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Prevalence of maternal health service utilization and associated factors

In this study, about two-thirds of 547(64.8%) [95% CI: 61.5-68.0] of mothers received maternal health care service during COVID-19. Binary logistic regression was fitted to assess the statistical association between factors and maternal health service utilization during the COVID-19 pandemic. All factors with p-value ≤0.2 on bi-variable logistic regression were taken to multivariable analysis to control for potential confounding effects. Accordingly, maternal age, maternal occupation, husband occupation, educational status, place of residence, distance from health the facility, estimated monthly income, media presence, marital status, gravidity, parity, face mask use, fear of COVID-19 infections, permission request from husband to visit a health facility, sitting nearby a person having the virus can transmit COVID-19, cough of a person having the virus can transmit COVID-19, sexual intercourse with an infected person can transmit COVID-19, risk of COVID-19 infection, confidence to protect COVID-19, received information about COVID-19 prevention, the practice of COVID-19 prevention measure had a p-value < 0.2 at bi-variable logistic regression and therefore taken to the multi-variable logistic regression. However, maternal educational status, distance from the health facility, monthly estimated income, fear of COVID-19 infection, permission request from husband to visit a health facility, and practicing COVID-19 prevention measures were significantly associated with maternal health service utilization at multivariable logistic regression.

The odds of maternal health service utilization during the COVID-19 pandemic in mothers who had primary education were 2.16 times higher than those who could not read and write (AOR=2.16, 95% CI: 1.29-3.60). Similarly, mothers who had secondary education had higher

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223   odds of maternal health service utilization during the COVID-19 pandemic than those who could

224   not read and write (AOR=1.97, 95% CI: 1.13-3.44). Moreover, the odds of maternal health

225   service utilization during the COVID-19 pandemic in mothers who had college and above

226   education were 2.89 times higher than those who could not read and write (AOR=2.89, 95%

227   CI:1.34-6.22).

228   Mothers who did travel 25-74 km to reach health facility were 63% less likely to utilize maternal

229   health service during the COVID-19 pandemic than those who did travel < 24 km to reach health

230   facility (AOR= 0.37, 95% CI:0.23-0.59). Furthermore, mothers who had to travel 75-99 km to

231   reach health facilities were 90% less likely to utilize maternal health service during the COVID-

232   19 pandemic than those who did travel < 24 km to reach health facility (AOR= 0.10, 95%

233   CI:0.05-0.19). While, mothers who earn 1000-2000 birr had higher odds of utilizing maternal

234   health service during the COVID-19 pandemic than those who earn <500 birr (AOR= 3.10, 95%

235   CI: 1.73-5.55). Likewise, the odds of maternal health service utilization during the COVID-19

236   pandemic were 2.66 higher in mothers who earn ≥2000 birr than those who earn <500 birr

237   (AOR=2.66, 95% CI: 1.52-4.64).

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239   The odds of utilizing maternal health care service during the COVID-19 pandemic in mothers

240   who did not fear COVID-19 infection was 2.79 times higher than in those who did fear COVID-

241   19 infection (AOR= 2.79, 95% CI:1.85-4.20). Moreover, mothers who had not had to request

242   permission from husband to visit the health facility had 7.24 times higher odds of utilizing

243   maternal health care service during the COVID-19 pandemic than those who had to request

244   permission from husband to visit the health facility (AOR= 7.24, 95% CI: 2.65-19.75). The odds

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245   of utilizing maternal health care services during the COVID-19 pandemic in those who practice

246   COVID-19 prevention measure were 5.82 times higher than in those who did not practice the

247   prevention measures (AOR=5.82, 95% CI: 3.87-8.75). The odds of maternal health services

248   utilization amidst COVID-19 were 2.06 times higher among mothers who use face mask than

249   those mothers who did not use a face mask (AOR= 2.06, 95% CI:1.28-3.31) (Table 4).

250   Table 4: Bi-variable and multi-variable logistic regression to assess factors associated with

251   maternal health services in the amid of the COVID-19, West Shoa Zone, central Ethiopia, 2020

252   (n=844)

Variables	Maternal health service utilization		Crude OR [95% CI]	Adjusted OR [95% CI]
	No	Yes		
Maternal age				
< 19 years	15	28	4.36 (1.60-1.86)	3.03 (0.66-13.93)
20-24 years	75	154	4.79(1.09-10.97)	2.74(0.84-8.96)
25-29 years	68	174	5.97(1.60-13.69)	3.03 (0.71-9.05)
30-34 years	82	116	3.30 (1.02-7.57)	3.03 (0.62-9.05)
35-39 years	36	62	4.28(1.05-10.32)	4.16 (0.86-13.34)
≥40 years	21	9	1	1
Maternal occupation				
Housewife	192	275	1	1
Government employee	22	95	3.02(1.83-4.97)	0.61 (0.28-1.31)
Self-employed	42	104	1.73(1.16-2.59)	0.74 (0.42-1.30)
Student	22	29	0.92(0.51-1.65)	0.62 (0.29-1.36)
Farmer	19	44	1.62 (0.92-2.86)	1.97 (0.96-4.03)
Husband occupation				

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Government employee	52	170	3.70(2.50-5.47)	0.98 (0.52-1.86)
Self-employed	67	224	3.78(2.64-5.43)	1.49 (0.84-2.64)
Student	9	10	1.26(0.50-3.19)	1.81 (0.45-7.24)
Farmer	146	129	1	1
Educational status				
Cannot read and write	105	60	1	1
Primary education	103	217	3.69(2.49-5.47)	2.16 (1.29-3.60)
Secondary education	71	172	4.24(2.78-6.46)	1.97 (1.13-3.44)
College and above	18	98	9.53(5.26-17.26)	2.89 (1.34-6.22)
Place of residence				
Urban	143	417	3.45 (2.56-4.67)	1.32 (0.73-2.40)
Rural	154	130	1	1
Distance				
<24 km	117	414	1	1
25-74 km	87	81	0.26 (0.18-.38)	0.37 (0.23-0.59)
75-99 km	80	35	0.12 (0.08-0.19)	0.10 (0.05-0.19)
≥100 km	13	17	0.37 (0.17-0.78)	0.53 (0.21-1.34)
Estimated monthly income in birr				
< 500	87	72	1	1
500-1000	108	92	1.03(0.68-1.56)	1.15 (0.66-2.00)
1000-2000	45	137	3.68 (2.32-5.82)	**3.10 (1.73-5.55)**
> 2000	57	246	5.22 (3.41-7.98)	**2.66 (1.52-4.64)**
Media				
Yes	225	497	3.18 (2.15-4.72)	1.01 (0.55-1.86)
No	72	50	1	1
Marital Status				
Married	269	528	2.89 (1.59-5.28)	1.96 (0.15-26.08)
Others	28	19	1	1

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Gravidity				
Prim gravida	95	234	3.63 (1.93-6.81)	1.51 (.64-3.52)
2-4	174	294	2.49 (1.35-4.59)	0.96 (0.43-2.14)
≥5 pregnancies	28	19	1	1
Parity				
Null para	57	108	4.06 (1.57-10.53)	2.73 (0.53-14.00)
1-4	225	432	4.11 (1.65-10.24)	2.16 (0.49-9.57)
≥ 5	15	7	1	1
Use face mask				
Yes	109	126	1.94(1.42-2.64)	**2.06 (1.28-3.31)**
No	188	421	1	1
Fear of COVID-19 infection				
Yes	212	269	1	1
No	85	278	2.58 (1.91-3.49)	**2.79 (1.85-4.20)**
Permission request from husband to visit the health facility				
Yes	264	471	1	1
No	11	66	3.36 (1.75-6.48)	**7.24 (2.65-19.75)**
Sitting nearby a person having the virus can transmit COVID-19				
Yes	171	383	1.72 (1.28-2.31)**	0.87 (0.56-1.34)
No	126	164	1	1
Cough of a person having the virus can transmit COVID-19				

Yes	202	437	1.87 (1.36-2.58)	1.24 (0.79-1.93)
No	95	110	1	1
Sexual intercourse with an infected person can transmit COVID-19				
Yes	4	21	2.92(0.99-8.60)	1.90 (0.55-6.57)
No	293	526	1	1
Risk of COVID-19 infection				
Yes	53	177	2.20 (1.56-3.12)	1.52 (0.98-2.38)
No	244	370	1	1
Confidence to protect COVID-19				
Yes	262	501	1.46 (0.92-2.32)	1.69 (0.86-3.30)
No	35	46	1	1
Received information about COVID-19 prevention				
Yes	166	413	2.43 (1.80-3.29)	**0.71 (0.22-2.24)**
No	131	134	1	1
Practice COVID-19 prevention measure				
Yes	148	405	2.87 (2.13-3.87)	**5.82 (3.87-8.75)**
No	149	142	1	1

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Discussion

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255   This study found the prevalence of maternal health service utilization was 64.8% [95%CI: 61.5-

256   68.0]. This prevalence is lower than the studies done in Ethiopia before the COVID-19 pandemic

257   [14, 15]. This might be due to the lockdown and movement restrictions brought about by the

258   ongoing pandemic and lack of transportation manifested as a result [16]. Also, the dread and

259   anxiety of visiting hospitals during COVID-19 has led many women to change their plan of

260   childbirth and they are planning to have home deliveries [6].

261   The current study reported that the odds of maternal health service utilization during the COVID-

262   19 pandemic were higher among mothers who had primary, secondary, and college and above

263   education than those who could not read and write. This is consistent with the study done in

264   developing countries [17], and Nigeria [18]. Moreover, mothers who earn more than 1000 birr

265   per month had higher odds of utilizing maternal health service during the COVID-19 pandemic

266   than those who earn < 500 birr. This is in agreement with the study done in developing countries

267   [17], and Nepal [19]. This is because economically independent women do not rely on other

268   people to decide to utilize maternal health services [20].

269   Furthermore, mothers who did travel 25-74 km and 75-99 km to reach the health facility were

270   63% and 90% less likely to utilize maternal health service during the COVID-19 pandemic than

271   those who did travel < 24 km to reach the health facility respectively. This might be due to a

272   change of plan of ANC follow-up, childbirth, and other maternal health services hence the first

273   delay, and planning to have home deliveries [6, 20]. Besides, the odds of utilizing maternal

274   health service during the COVID-19 pandemic in mothers who did not fear COVID-19 infection

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275 was 2.79 times higher than those who did fear COVID-19 infection. This could be due to the

276 psychological and social effects of the COVID-19 pandemic which is more pronounced in

277 women forcing them to plan home deliveries not to expose their family to the infection [6].

278 Besides, mothers who had not had to request permission from husband to visit health facility had

279 the higher odds of utilizing maternal health service during the COVID-19 pandemic than those

280 who had to request permission from the husband to visit a health facility. This is consistent with

281 the studies done in Ethiopia [14, 21]. This might be due to women's autonomy is positively

282 associated with maternal health service utilization. Also, women with control over resources

283 including physical, human, intellectual, and financial resources are more independent in deciding

284 and seeking health care [21]. The odds of utilizing maternal health service during the COVID-19

285 pandemic in those who practice COVID-19 prevention measure was 5.82 times higher than in

286 those who did not practice the prevention measure Similarly, the odds of maternal health service

287 utilization amidst COVID-19 were 2.06 times in mothers who use face mask than those mothers

288 who did not use a face mask. This is following the study done in Iran [22].

289 ## Conclusion

290 In this study, the prevalence of maternal health service utilization was found low. Furthermore,

291 maternal educational status, distance from the health facility, monthly estimated income, fear of

292 COVID-19 infection, permission request from husband to visit a health facility, and practicing

293 COVID-19 prevention measures were found to be significantly associated with maternal health

294 service utilization. The federal ministry of health and regional health bureau should work in

295 collaboration to aware of the community and mothers, in particular, to increase the maternal

21

296   health service during the pandemic while practicing the necessary preventive measures to control

297   the spread of the infection.

298   **List of abbreviations:** ANC-Antenatal Care**; COVID□19:** Corona Virus Disease

299   2019; **PNC:** Postnatal Care; **WHO**-World Health Organization

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