Knowledge, perceptions and preventive practices towards COVID-19 among Jimma University Medical Center visitors, Southwest Ethiopia

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Abstract

Background: The novel-coronavirus disease-2019 (COVID-19) is currently a pandemic and public health emergency of international concern, as avowed by the World Health Organization (WHO). Ethiopia has become one of the affected countries as of March 15, 2020.

Objective: This study aimed to assess the knowledge, perceptions, and practices among Jimma University medical center (JUMC) visitors in Jimma town.

Methods: A cross-sectional study was conducted on 247 sampled visitors, from 20-24 March, 2020. Consecutive sampling was used to recruit participants. The study tools were adapted from WHO resources. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. Descriptive statistics was used to describe the status of knowledge, perception and practices. Logistic regression was executed to assess predictors of dominant preventive practices.

Results: of the 247 respondents, 205 (83.0%) knew the main clinical symptoms of COVID-19. 72.0% knew that older people who have chronic illnesses are at high risk of developing a severe form of COVID-19. About 95.1% knew that COVID-19 virus spreads via respiratory droplets of infected people while 77 (31.2%) of the respondents knew about the possibility of asymptomatic transmission. Only 15 (6.1%) knew that children and young adults have to involve preventive measures. Overall, 41.3% of the visitors had high knowledge.The majority, 170(68.8%), felt self-efficacious to control COVID-19. 207(83.3%) believed that COVID-19 is a stigmatized disease. Frequent hand washing (77.3%) and avoidance of shaking hands (53.8%) the were dominant practices. Knowledge status and self-efficacy (positively), older ages and unemployment (negatively) predicted hand washing and avoidance of handshaking.

Conclusions: The status of knowledge and desirable practices were not sufficient enough to combat this rapidly spreading virus. COVID-19 risk communication and public education efforts should focus on building appropriate level of knowledge while enhancing adoption of recommended self-care practices with special emphasize on high-risk audience segments.

Background

The novel-coronavirus disease currently is a global health threat and public health emergency of international concern (1). The severe acute respiratory syndrome outbreak that was linked to coronavirus (SARS-COV) was first reported in 2003 (2). Sixteen years later, a closely similar outbreak, which first received the name novel-SARS-COV2 was detected. The outbreak was first reported in late December 2019 when clusters of pneumonia cases of unknown etiology were found to be associated with epidemiologically linked exposure to seafood market and untraced exposures in the city of Wuhan of China at Hubei Province (3). It wasby far the largest outbreak of atypical pneumonia since the SARS outbreak. In the initial stage of the outbreak, the total number of cases and deaths exceeded those of SARS (2). Subsequently, the spread of the virus has shown exponential growth and spread to all continents and received a unique name by COVID-19 from World Health Organization (WHO) (4). On

Januanry 30, 2020, WHO declared that COVID-19 is a pandemic disease (1,4). As of December 2019 till April 9, 2020, the pandemics registered 1,425,468 cases and 81,939 deaths in the world. Ethiopia has become among the COVID-19 affected countries as of March 15, the date on which one imported case was first detected. Till April 9, 2020, there was 56 total notified cases and 2 deaths in Ethiopia.

Similar to SARS, COVID-19 is a beta-coronavirus that can spread to humans through intermediate hosts such as bats (5). Available evidence has shown that the virus spreads from human-to-human mainly through respiratory droplets and body contacts (6,7). Contact with contaminated surfaces, hands, and touching of faces-eye-nose-mouth are predominant ways to get exposed to the infected droplets. On top of this, some of the factors that aggravated the rapid spread of the virus were: firstly, on average, every case of COVID-19 will create up to 4 new cases (transmissibility=4.08) (8). Secondly, the average incubation period is estimated to be as short as 5.2 days, with variation among patients (9). Thirdly, the capability of asymptomatic transmission of the virus (8-11). Thus, COVID-19 has become highly contagious and reached out to more than 200 countries within 3 months.

COVID-19 has no effective cure, yet early recognition of symptoms and timely seeking of supportive care and preventive practices enhance recovery from the illness and combat the spread of the virus. The symptoms of i COVID-19 infection includes fever, fatigue, cough, sore throat, breathing difficulty, myalgia, nausea, vomiting, and diarrhea (12,13). Older men with medical comorbidities are more likely to get infected, with worse outcomes. Severe cases can lead to cardiac injury, respiratory failure, acute respiratory distress syndrome, and death (12-14). The provisional case fatality rate by WHO is around 3.4% (4). Knowledge of the symptoms, high-risk conditions, risky practices, and the prognosis is paramount importance to curb the pandemics by boosting the probability of practicing avoidance of contact with contaminated surfaces/hands/ objects, washing of hands, keeping physical distances, taking precautions while coughing/sneezing, using an alcohol-based rub and other protective equipment.

Even though there are strong initiatives and recognition of the public health importance of COVID-19 by the Ethiopian government (screening, quarantine and treatment centers), there is a strong need to reinforce community awareness and practices in order to stop the nationwide spread of the virus. Therefore, this study was aimed to assess knowledge, perceptions, and practices that inform communication and community engagement efforts in the fight against COVID-19 among community members who visited Jimma University medical center (JUMC) in Jimma town, SouthWest of Ethiopia.

Methods And Materials

Study setting and period

This study was conducted in JUMC during March 22-28, 2020, i.e. within two weeks of the first COVID-19 case in Ethiopia. JUMC is located in Jimma town, the capital of Jimma zone in Oromia National Regional State. JUMC provides specialized and referral diagnostic and treatment services. As one of the limited national COVID-19 testing centers, JUMC is readily organized to serve quarantine and treatment with 200 consecrated beds.

Study design

A hospital-based cross-sectional study design was conducted to rapidly assess knowledge, perceptions, and practices among clients and patients visited the medical center.

Population and sample

The study was conducted among JUMC visitors of all kinds. The visitors expectedly came from different localities including regional towns for referral services. The visitors' samples were from different wards: emergency, inpatients, outpatients, specialized clinics (maternal, TB/HIV, chronic illness, internal medicine, surgery etc.).

Sample size determination and sampling

The single population formula was used to determine the sample size. Accordingly, the formula for sample size determination uses is: $n = (Z_{\alpha/2})^2 * [(p_1 q_1)/(d)^2]$; where n denoted visitors sample size, $Z_{\alpha/2}$ is reliability coefficient of standard error at 5% level of significance =1.96, p = proportion JUMC visitors who are knowledgeable about COVID-19 (50%, no previous study found) and d refers to the level of standard error tolerated (5%). Hence, the calculation yielded to a sample size of 247 visitors after adjusting for total visitors' population that was expected to visit the hospital in one week period An equal proportion of the sample was allocated to major wards/clinics inthe hospital. Finally, consecutive sampling was applied until the allocated sample size was filled.

Instrument and measurement

The survey was conducted using tools that were adapted from WHO resources and similar literatures (15-17).The knowledge questions had 14 items covering issues such as symptoms, risk conditions, and prognosis, modes of transmission and safety and precuations in COVID-19. Perceptions were measured by three questions about self-efficacy, collective efficacy and stigma. The visitors were asked about their experiences over the last few days since the onset of COVID-19 pertaining to hand washing, avoidance of shaking hands, overcrowded places, physical proximity while walking/greeting etc. All the questions elicited a 'yes'/'no' response. Overall knowledge status was indicated by three labels: low (<=8 of 14), moderate (9-10 of 14) and high (>=11 of 14 items)

Data collection, management and analysis

The data were collected through an exit interview at clinics/wards in JUMC by trained and experienced enumerators. A minimum of one-meter distance was kept between interviewers and interviewees. A pretested translated version of the instrument was used for data collection. The data analysis was managed by software for statistical package for social science package (SPSS) version 20.0. Before further data analysis, reverse scoring for negatively worded items, normality curve, tests of homogeneity of variances were checked. Knowledge was first analyzed item by item correct rate. Then, a multi-dimensional knowledge score (MDKS) was calculated by summing up the items. Using a quartile score,

11 of 14 correct answers were used as a cut-off of value for high knowledgeable. ≤8 of 14 items were labeled as low knowledge. Independent sample t-test and analysis of variance (ANOVA) were done to test differences in means of MDKS by socio-demographic variables and efficacy-stigma perceptions. Predictors of COVID-19 preventive actions that were dominantly practiced were executed using logistic regression. Adjusted odds ratios were used to interpret variables in the final model of preventive practices.

Ethical considerations

The study was ethically approved by the institutional review board (IRB) of Jimma University. Verbal informed consent was sought from every respondent. The data collectors were observed for 14 days after completion of the survey. The interviewers wore protective face masks. Reasonable physical distance was kept between the involved individuals during data collection. Potential risk was minimal at the time of the study. The data was collected in a private condition and kept confidential.

Results

Socio-demographic characterstics of the respodents

A total sample of 247 JUMC visitors were approached. The respondents' mean age was (30.5 ±10.2) years. More than 3/4th, 189 were male. 52 (21.1%) of visitors neither able to read nor write. Higher proportions of respondents were married (62.3%), Muslims (59.9%), and farmers (31.2%) (Table 1 presented the details of socio-demographic charactertsics).

Table 1: Socio-demographic characteristics of JUMC visitor respondents, Jimma, March 2020 (n=247)

Variable	Frequency (n)	%
Age (years)		
≤19	22	8.5
20-29	110	44.5
30-39	65	26.3
40-49	36	14.6
50-59	10	4.0
≥60	4	1.6
Mean (±St.D) of age (in year)	*30.5(mean)*	*(±10.2)St.D*
Sex		
Male	189	76.5
Female	58	23.5
Educational status		
Cannot read and write	52	21.1
Read and write	20	8.1
Primary (1-8 grade)	52	21.1
Secondary (9-12 grade)	62	25.1
College and above	61	24.7
Marital status		
Single	91	36.8
Married	154	62.3
Divorced	1	0.4
Widowed	1	0.4
Occupational status		
Farmer	77	31.2
Student	75	30.4
Currently unemployed	38	15.4
Government employed	34	13.8
Private business/employed	23	9.3
Religion		
Muslim	148	59.9
Orthodox	56	22.7
Protestant	39	15.8
Others*	4	1.6
Monthly Income (ETB)		
≤499	122	49.4
500-2000	62	25.5
≥2001	63	25.1
Median (mean)	500 (1,723.2)	

*others=Wakefata, Jehovah witness, ETB= Ethiopian Birr, JUMC=Jimma Medical Center

Knowledge and perception about COVID-19 among hospital visitors

Analysis of quartiles of knowledge about COVID-19 revealed that >50% of JUMC visitors correctly responded to 10 of 14 knowledge items. The knowledge components were presented as follows (Table 2 presents details):

Symptoms: 205 (83.0%) of the visitors knew the main clinical symptoms of COVID-19 as fever, fatigue, dry cough and myalgia. In fact, < 2/5th (37.7%) of the respondents mentioned other symptoms such as

stuffy nose, runny nose, and sneezing that distinguish COVID-19 from common cold/flu.

Risk factors and prognosis: One hundred seventy-nine (72.5%) of the visitors knew that elderly people who have chronic illnesses and obesity are at higher risk of developing a severe form of COVID-19. Almost the same proportion knew that COVID-19 had no effective cure yet early seeking of treatment increases the chance of recovery.

Mode of transmission: High proportion (95.1%) of the visitors knew that the COVID-19 virus spreads via respiratory droplets of infected people. However, 77 (31.2%) of the respondents reported that asymptomatic transmission is possible

Prevention Practices: Properly washing hands with soap and water (95.5%), not touching eye-nose-mouth with unwashed hands (92.7%) and avoiding crowded places (90.3%) were commonly known methods of preventing COVID-19 transmssion. However, 15 (6.1%) mentioned that it is necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.

Table 2: Knowledge about COVID-19 among JUMC visitors, Jimma, Ethiopia, March 2020 (N=247)

Variable (n=247)	Frequency (%)	
	Correct	Incorrect
Knowledge of symptoms		
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia (n=247)	205 (83.0)	42 (17.0)
Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus (n=247)	93 (37.7)	154 (62.3)
Knowledge of high risk and prognosis		
Not all persons with COVID-2019 will develop severe cases. Only those who are elderly, have chronic illnesses & are obese are more likely to be severe cases (n=247)	179 (72.5)	68 (27.5)
There currently is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection (n=247)	178 (72.1)	69 (27.9)
Knowledge about Mode of transmissions and infectiousness		
The COVID-19 virus spreads via respiratory droplets of infected individuals (n=247)	235 (95.1)	12 (4.9)
Eating or contacting wild animals would result in the infection by the COVID-19 virus (n=247)	119 (48.2)	128 (51.8)
Persons with COVID-19 cannot infect the virus to others when a fever is not present (n=247) *	77 (31.2)	170 (68.8)
Knowledge about ways of prevention		
Proper washing hand with soap and water is one method of preventing COVID-19 (n=247)	236 (95.5)	11 (4.5)
One way of prevention of COVID 19 is not touching the eye, nose by unwashed hands (n=247)	229 (92.7)	18 (7.3)
To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations (n=247)	223 (90.3)	24 (9.7)
Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus (n=247)	216 (87.4)	31 (12.6)
People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place (n=247)	216 (87.4)	31 (12.6)
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus (n=247)	212 (85.8)	35 (14.2)
It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus (n=247)*	15 (6.1)	232 (93.9)
Quartiles of correctly answered knowledge (of 14 items)		
Quartile 1 (0-25%)	1-8 of 14	-
Quartile 2 [25-50%)	9 of 14	-
Quartile 3 [50-75%)	10 of 14	-
Quartile 4 [75-100%)	11-14 of 14	-

* Correction rate calculated from ‘no’ response for false statements, ** MDKS constructed from 14 correct items JUMC=Jimma Medical Center

Multi-dimensional knowledge status about COVID-19 among hospital visitors

Multidimensional (symptoms, risk factors & prognosis, transmission modes, and preventive methods) analysis of knowledge of COVID-19 indicated that 41.7% and 41.3% of JUMC visitors were moderately

and highly knowledgeable respectively (Figure 2). The line graph showed counts of correctly answered knowledge items(score >=11) referred to highly knowledgeable class (figure 1).

Exposure to training and perception to combat the spread of COVID-19 among JUMC visitors

Only 8(3.2%) visitors reported exposure to organized educational sessions about COVID-19. Two hundred seven, 83.8% of the visitors felt that COVID-19 is a stigmatized disease and 68.8% of the visitors perceived self-efficicous to control it.

Differences in knowledge and perceptions by socio-demographic variables

Analysis of variance (ANOVA) indicated that multidimensional knowledge (MDK) score on COVID-19 was significantly different by some socio-demographic variables (educational status, age groups, and occupation) For example, post-hoc tests using Bonferroni (equal variance assumed) and Tamhane (unequal variance assumed) methods showed that visitors whose educational status was secondary school and above had higher meanof MDK score (F=5.38, Pv <0.005) compared to lower graders and non-attendants of formal education. Additionally, visitors whose ages ranged between 30-49 years had lower means of MDK score compared to younger ages (F=2.29, pv <0.05). Farmer visitors had lower means of MDK score compared to employment in private/government businesses and students. And, unemployed ones had lower means compared to farmers (F=5.51, Pv <0.05). Moreover, independent sample t-test showed that visitors who were single had higher mean of MDK score (t=2.64, Pv <0.05) compared to married ones. Respondents' religious affiliations, sex and perceived self-efficacy showed no significant differences in means of MDK score, (F=1.25, Pv=0.294), (t=1.74, Pv=1.17) and (t=1.92, pv=0.056) respectively. Perception of self-efficacy to combat COVID-19 had shown no significant difference by socio-demographic variables.

COVID-19 preventive practices among JUMC visitors

Over the last few days, JUMC visitors were predominantly engaged on frequent hand washing with water & soap (77.3%), stopped shaking hands while giving greeting (53.8%), avoided physical proximity (33.6%) and going to crowed places (33.2%) in order to protect themselves from COVID-19 (Table 3 presents details).

Table 3: JUMC visitors COVID-19 preventive practices, Jimma, Ethiopia, March 2020 (n=247)

Practice variables	Frequency (%)	
Over the last few days following the report of COVID-19 in Ethiopia, I...	Yes (%)	No (%)
am frequently washing hands with water and soap	191 (77.3)	56 (22.7)
stopped shaking hands while giving greeting	133 (53.8)	114 (46.2)
avoided close proximity including while greeting (within 1 meter)	83 (33.6)	164 (66.4)
have not been going to crowed place	82 (33.2)	165 (66.8)
wore mask when leaving home	35 (14.2)	212 (85.8)
avoid touching eye, nose, mouth before washing hands	28 (11.3)	219 (88.7)
wore mask/used cover /elbow for coughing/sneezing	28 (11.3)	219 (88.7)
others (alcohol-rubbing, no contact with surfaces)	14 (5.7)	233 (94.3)
Have started to stay home	4 (1.6)	243 (98.4)

Predictors of engagement on COVID-19 major preventive actions

Socio-demographic characteristics, knowledge and self-efficacy were important factors that predicted adaption of measures that protect from COVID-19. Table 4 provides the details.

Predictors of frequent hand washing practice

JUMC visitors who were at 40-49 years old and unemployed were averagely 91% and 72% less frequently washed their hands over the last few days compared to their counterparts in youngest age-groups & farming occupation, respectively. Visitors who belong to the highest knowledge class were averagely 3.48 times washers compared to those with low knowledge. In fact, majority of specific knowledge and perceived efficacy items had crude and positive effect on the practice of washing hands. Overall, the above predictors explained 38.7% of the variance of frequent hand washing practice.

Predictors of avoidance of hand shaking practice

JUMC visitors who were employed at private business and government offices were averagely 5.7% and 2.68 times more likely to avoid the practices of shaking hands for greeting over the last few days compared to those whose occupation was farming, respectively. With regard to specific knowledge predictors; respondents who perceived animal contacts spreads COVID-19 and wearing masks prevents the infection by COVID-19 were 2.73 and 2.88 times more likely careful to avoid shaking hands. Visitors who belong to the highest knowledge class were averagely 2.45 times avoiders of shaking hands compared to those with low knowledge. Visitors who felt self-efficacious to successfully control COVID-19 were 3.89 times more likely to engage on avoidance of shaking hands compared to those with low-efficacy. In fact, the crudes odds ratio showed that many of knowledge items and socio-demographic variables (being females, higher educational levels) have positively influenced the avoidance of shaking hands. Overall, the above predictors explained 32.9% of the variance of frequent hand washing practice.

Table 4: Predictors of COVID-19 preventive measures, JUMC visitors, Jimma, March 2020 (n=247)

Factor variables	Frequent hand washing with soap & water		Stopped shaking hands	
Socio-demographic	COR (95% CI)	AOR	COR	AOR
Age groups				
<=19	1	1	1	1
20-29	1.00 (0.26,3.80)	0.78(0.14,4.25)	2.34(0.92,5.94)	1.54(0.45,5.22)
30-39	2.24(0.60,8.54)	0.29(0.04,2.21)	1.58(0.60,4.22)	1.16(0.25,5.29)
40-49	0.16(0.04,0.63) *	0.09(0.01,0.74) *	1.03(0.35,3.03)	1.90(0.30,12.32)
>=50	1.73(0.30,10.10)	0.42(0.04,4.38)	1.44(0.38,5.57)	1.61(0.75,3.44)
Sex				
Male	1	1	1	1
Female	1.02(0.50,2.01)	0.76(0.27,2.12)	1.88(1.02,3.47) *	1.61(0.75,3.44)
Educational status				
Neither read nor write	0.26(0.10,0.67) *	0.28(0.04,1.76)	0.26(0.12,0.57) *	0.64 (0.16,2.55)
Read and write	0.35(0.11,1.18)	0.33(0.04,2.66)	0.91(0.31,2.62)	2.55(0.50,13.10)
Primary school	0.45(0.17,1.20)	0.34(0.07,1.60)	0.42(0.20,0.90) *	0.79(0.25,2.49)
Secondary school	0.79(0.29,2.15)	0.35(0.09,1.50)	0.72(0.35,1.51)	0.81(0.30,2.19)
College and above	1	1	1	1
Religious affiliation				
Muslim	1	1	1	1
Orthodox	1.59(0.73,3.46)	0.70(0.26,1.95)	1.77(0.95,3.31)	1.03(0.47,2.23)
Protestant	1.34(0.57,3.16)	1.12(0.32,4.00)	2.29(1.10,4.80) *	2.02(0.78,5.20)
Marital status				
Single	1	1	1	1
Married	029(0.14,0.61) *	0.44(0.13,1.45)	0.66(0.39,1.11)	0.70(0.28.1.75)
Occupation				
Farmer	1	1	1	1
Student	3.12(1.33,7.31) *	0.30(0.05,1.75)	1.89(0.99,3.60)	1.15(0.34,3.89)
Unemployed	0.73(0.32,1.66)	0.28(0.08,0.97)*	1.34(0.61,2.92)	1.60(0.57,4.46)
Private employed	2.02(0.62,6.61)	1.08(0.18,6.34)	4.20(1.49,11.85) *	5.70(1.42,22.70)*
Gov't employed	1.99(0.73,5.45)	0.34(0.05,2.25)	4.12(1.70,10.01) *	2.68(1.01,7.12) *
Knowledge (yes)				
Knew main clin.symptom	3.75(1.86,7.59) *	3.30(1.03,19.54) *	2.77(1.38,5.57) *	1.62(0.5, 4.99)
Differentiated COVID-19 from symptoms of flu	2.38(1.20,4.72) *	1.64(0.58,4.59)	2.17(1.28,3.70) *	1.29(0.51,3.24)
Knew high risk group	2.04(1.10,3.83) *	1.10(0.38,3.18)	1.72(0.98,3.01)	0.75(0.2, 2.03)
Early supportive treatments increase recovery	2.70(1.44,5.04) *	1.23(0.45,3.41)	2.50(1.41,4.42) *	1.75(0.66,4.66)
COVID-19 spreads via respiratory droplets	3.70(1.14,11.97) *	1.72(0.30,9.92)	2.43(0.71,8.31)	1.59(0.28,9.05)
Eating or contact with animals spreads COVID-19	1.93(1.10,3.54) *	1.11(0.44,2.79)	1.94(1.17,3.22) *	2.73(1.27,5.88) *
Proper hand washing prevents COVID-19	4.46(1.31,15.23) *	2.05(0.30,13.97)	3.27(0.85,12.63)	1.49(0.19,11.94)
Wearing mask prevent infection by COVID-19	1.76(0.78,4.00)	0.96(0.30,3.21)	3.30(1.45,7.49) *	2.88(1.04,8.00) *
Avoiding crowed place prevents COVID-19	4.95(2.10,11.80) *	3.80(1.08,13.34) *	1.7(0.73,4.04)	1.07(0.28,4.11)
Isolation of infected people prevents COVID-19	2.70(1.27,5.75) *	1.52(0.47,4.96)	0.98(0.48,2.00)	0.64(0.20,2.01)
Immediate contact isolation prevents COVID-19	4.00(1.83,8.75) *	3.89(1.24,12.17) *	1.28(0.60,2.73)	1.03(0.34,3.12)
MDK status				
Less	1	1	1	1
Moderate	2.01(0.94.4.31)	1.98(0.82,4.82)	2.12(1.00,4.48) *	1.86(0.82,4.25)
High	4.66(2.00,10.87) *	3.48(1.34,9.09) *	3.67(1.72,7.84) *	2.45(1.06,5.65) *
Attitude & efficacy (yes)				
Self-efficacy to control COVID-19	3.54(1.90,6.57) *	1.58(0.45,5.61)	2.83(1.62,4.94) *	3.89(1.44,10.50) *
Collective efficacy to control COVID-19	2.85(1.55,5.26) *	2.99(0.83,10.72)	1.75(1.03,2.98) *	0.78(0.30,2.05)

R-square (R^2) =38.7% and 32.9% for hand washing and not-shaking hands, *significant at $p<0.05$, COR: Crude Odds Ratio, AOR: Adjusted Odds Ratio

Discussion

This study assessed the knowledge, perceptions and practices pertaining to COVID-19 following the onset of the pandemics in Ethiopia. Thus, it would be a springboard for enhancing public education and engagement to stop the spread of this contagious virus before it is too late.Despite significant proportion (83.0%) of JUMC visitors had known the main clinical symptoms of COVID-19, only 37.7% of them were able to identify symptoms like (stuffy nose, runny nose and sneezing) that distinguish it from common cold/flu. Confusing the symptoms of COVID-19 with common cold could challenge early treatment seeking behaviors when COVID-19 is accompanied with flu/common cold like syptoms. Moreover, the confusion can intensify bias and social stigma related to COVID-19. According to the present study, 83.8% of the visitors perceived that COVID-19 is a disease leading to social stigma. In history, similar epidemics were associated with stigma (18,19). WHO recommends that any communication and case management efforts should simultaneously address stigma assocaited with COVID-19 by providing do's and don'ts/facts (20).This indicated governments, media, health facilities and local organizations are expected to intergrate stigma reduction interventions all COVID-19 activities.

With regard to knowledge of risk factors and prognosis, good proportions (72.5%) of the JUMC visitors knew that elderly people who have chronic illnesses and obese are at high risk of developing a severe form of COVID-19. And, 72.1% knew that early seeking of treatment increases the chance of recovery despite there is no effective cure developed till the moment. Although this level of knowledge is promising to safeguard the most at-risk population segment, it could divert the attention of the young/adult public to adopt preventive measures. The misperception that young/children are at low risk of COVID-19 is found under WHO's list of rumors that could grant false assurance (15,21). The finding from the current study supported this idea, as only 15 (6.1%) of the respondents perceived that it is necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus. This requires adequately addressing children and young people in COVID-19 communication messagings.

This study found out that the knowledge about the major mode of transmission was as high as 95.1% i.e. the visitors knew that COVID-19 virus spreads via contamination with respiratory droplets of infected people. But, only 77 (31.2%) of the respondents knew that asymptomatic people who don't even present with fever can still transmit the virus The latter implies two main points: first, there could be a compromise in the adaptation of safety precautions measures, especially the practice of covering the breathing system during coughing/sneezing and proximity one can have with potentially infected ones. Secondly, in resource limited settings where nationwide active searching for infected people is minimal or absent, the chance of asymptomatic transmission and spread of the novel-coronavirus would be high (3,10,22). In this regard, Ethiopia has not yet decentralized diagnostic centers very well.

Concerning the knowledge about methods of preventing infection by COVID-19, JUMC visitors dominantly mentioned proper washing of hands (95.5%), not touching face-eye-nose-mouth before washing hands (92.7%) and avoiding crowded places (90.3%). If the above knowledge is executed to self care practice by individuals and the public at large, it can help prevent spreading of the virus in country.

Nevertheless, there were huge gaps between the magnitude of knowledge of preventive methods and the actual practices. For example, only 77.3%visitors had reportedly been frequently washing their hands with water and soap although the knowledge was as high as 95.5%. In the same manner, those who reported that they had not been going to crowed places were 33.2% although the knowledge that avoidance of crowded places prevents from infection by novel-coronavirus was 90.3%. Perhaps, in resource limited settings several reasons can be mentioned as to why people cannot frequently and properly wash their hands and easily avoid crowded places. For instance, to mention some, Ethiopia is known by modest coverage and intermittent continuity of water supply and hand washing facilities, high rate of overcrowded living condition and frequent social anf religious ceremonies and high unemployment rate calling for an urgent efforts to brige the gap between knowledge and practices (23.24).

This study has found out that hand washing and avoidance of shaking hands for greeting as two dominantly practiced methods of preventing the infection by COVID-19. Still, avoidance of non-careful touching of face parts that are used for the entrance of the virus, wearing masks/cover while coughing/sneezing, use of sanitizers and stay at home was very low (1.6%-11.3%). The entire practices were not as high in contrast to the contagiousness nature of the virus. In the absence of adaptation to these practices as packages, the entire public is at high to contract the infection (8-10).

Analysis of predictor of frequent hand washing (with soap and water) showed that older age groups, particularly in 40-49 years and unemployed, were risk social groups. The above discussions about social variables similarly applicable here. Highly knowledgeable visitors were averagely more than three folds likely to frequently wash their hands compared to the less knowledgeable ones. Specifically, knowledge of main clinical symptoms, the necessity of avoiding overcrowded places and immediately isolating the contacts with infected people as a means of prevention were all more than 3 folds likely to go for washing hands frequently as a fight against COVID-19. Accurate, timely and relevant knowledge is consistently associated with mild threat that enhances the adaption of safety practices & precautions (16,17)

Similarly, working for private and government businesses were positive predictors of avoidance of shaking hands for greeting. Perhaps, they had strict instructions about avoidance of shaking hands at offices compared to farmers. Visitors who were highly knowledgeable were averagely more than 2 folds likely to avoid shaking hands compared to the less knowledgeable ones. Specifically, visitors who were more careful about eating/contacts with animals, leaning towards wearing masks to prevent COVID-19 and felt self-efficacious to successfully control COVID-19 were more than 2-3 folds likely avoid handshaking to combating COVID-19. It looked these people were more concerned about contacts and adapted with hygienic precautions.

Finally, the authors would like to report the limitation of the study in that the findings were not well discussed against related literature. To the best of our knowledge, there were no similar published studies from Ethiopia. Moreover, this study relied on self-reported practices. In this urgent time of dealing with the

pandemics, there would reach a certain level of social desirability that can bias the reports about the practices.

Conclusions

Magnitudes of the visitors' protective level of knowledge , perceived self-efficacy to control and preventive practices such as hand washingavoidance of hand shakingand no physical proximitywere modest to protect themselves from this highly contagious virus. Notably, some knowledge/perception about COVID-19 were very low and needs an urgent improvement: "*it is necessary for children/young adults to take measures to prevent the infection (6.1%*)", "*asymptomatic-in the absence of fever transmission (31.2%)*" and "s*ymptoms that distinguished it from the common cold (37.7%)*". There were huge discrepancy between knowledge of prevention methods and actual practices especially in case ofhand washing . In such highly contagious virus with no effective cure, high-level knowledge status must be achaived in the population to stop the spread of the virus .This is because better knowledge of the disease and prevention methods frequently washed their hands and avoided handshaking though the link between knowledge an practice was inconsistent Perceived personal and collective efficacy to stop COVID-19 enhanced the dominant practices. Therefore, the risk communication and community engagement efforts for combating COVID-19 should emphasize on addressing key preventive methods,use dissonanting messages to close the gaps between existing knowledge and actual behaviors, keepadvancing knowledge status based on the contexts pertaining tosignificant socio-demographic characteristics for desiging effective and tailored communition strategies. The finding also suggests interventions on COVID-19 should simultaneously address the issue of social stigma and dsicrimnation before it gets out of control.

Declarations

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Authors' contributions: AA, YK, YY, SB, ZB conceived and design the study. YK analyzed the data and drafted the manuscript. All authors critically reviewed the manuscript. All authors approved the

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Figures

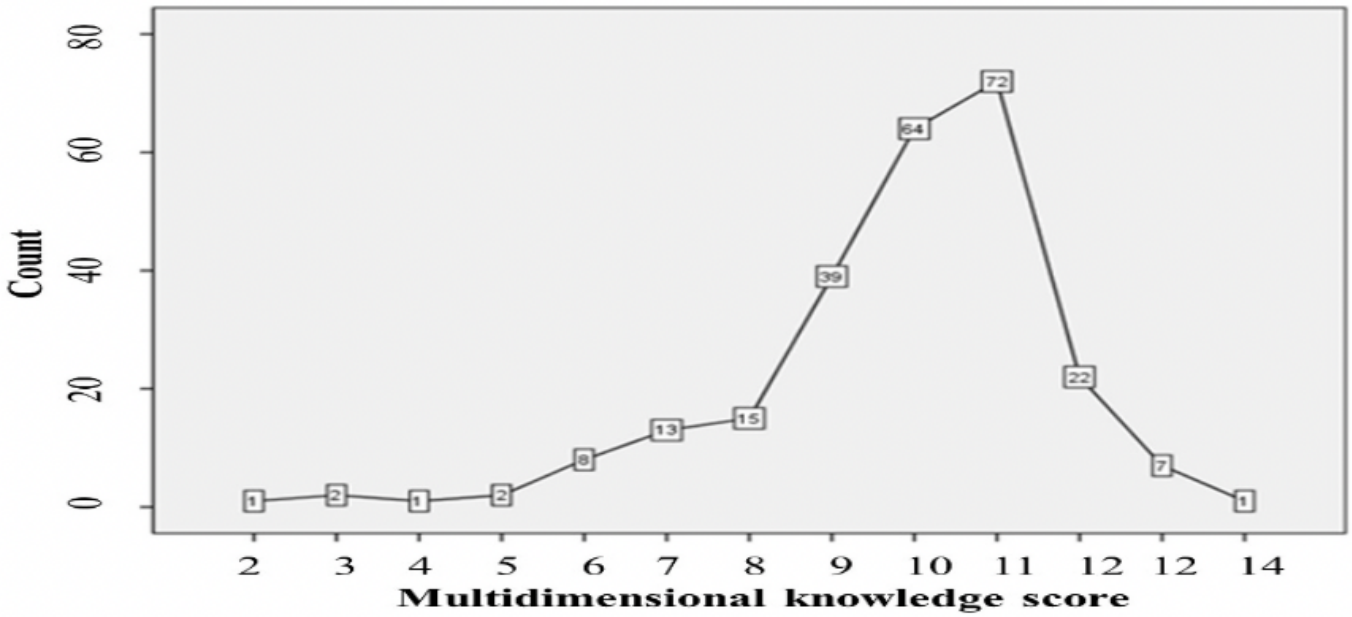

Figure 1

Line graph showing counts for summation scores of knowledge items about COVID-19, Jimma, March 2020

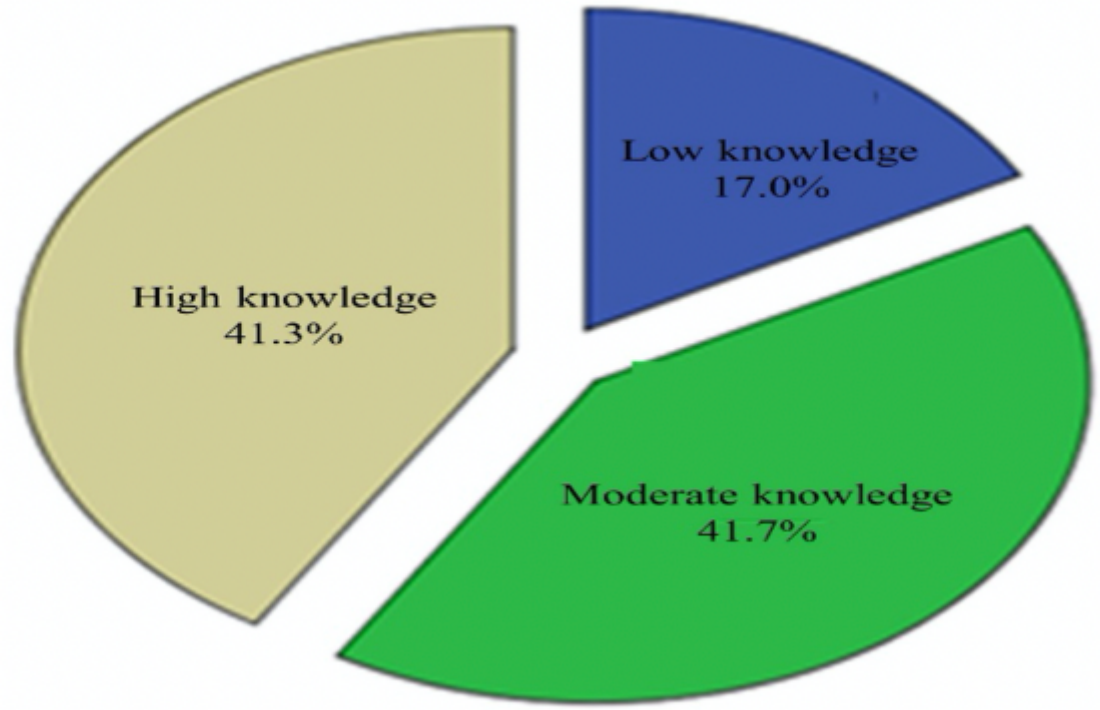

Figure 2

Pie chart indicating multi-dimensional knowledge status about COVID-19, Jimma, March, 2020

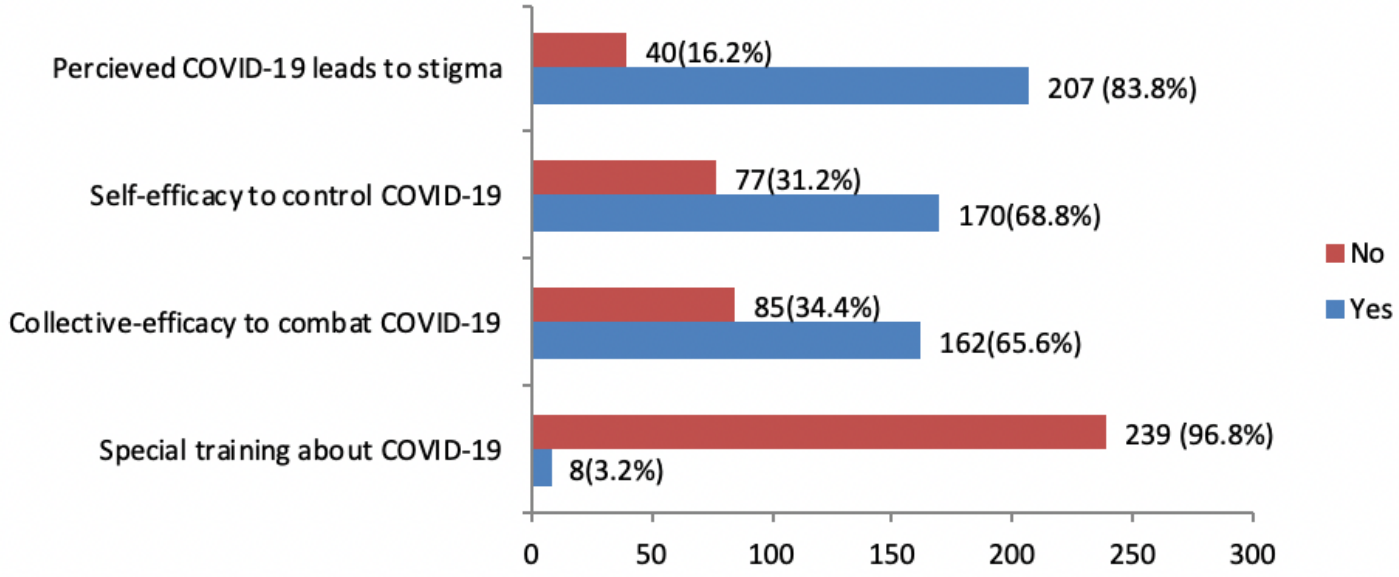

Figure 3

Bar graph indicating experience of training session and perceived stigma and efficacy to combat COVID-19, JUMC visitors, Jimma-Ethiopia, March 2020