Community's Mask Wearing Practice and Its Associated Factors for COVID-19 prevention in Metropolitan city, Northwest, Ethiopia

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Abstract

Background: - Corona virus Disease, 2019 has been pandemic all over the world due to its strong human to human transmission. A number of measures have been put in place to prevent its spread among the population. However, for these preventive measures to be effective, the population should practice an appropriate COVID-19 prevention method. To our knowledge, there is no study yet done in the Amhara region. Thus, this study was aimed at assessing mask wearing practice and its associated factors for COVID-19 prevention among residents of metropolitan towns in the Amhara region, Ethiopia.

Methods: A community-based cross-sectional study was conducted from June 20 to July10, 2020. A total of 413 residents of metropolitan towns of the Amhara region, Ethiopia were enrolled in the study. A systematic sampling technique was used to collect data from selected households. Data were entered into EPI-DATA version 3.1 and then exported to SPSS version 24.0 for analysis. To identify the factors of mask wearing practice for COVID-19 prevention, multiple binary logistic regression analysis was used. Statistical significance was declared at p-value<0.05. An adjusted odds ratio with 95% confidence intervals was used to assess the direction and strength of associations.

Results: Four hundred thirteen residents were participated in the study with a response rate of 97.6%. Of these, 234 (56.6%) were female, 229 (55.4%) were lay in the age group of 31−45 years old, and 321 (77.7%) were married. The proportion of residents who had good mask wearing practice in the current study was 57.1% [(95%CI: 52.35%, 61.94%)]. Having formal education [AOR = 5.046, 95% CI (2.713, 9.385], employed [AOR = 1.827, 95% CI (1.172, 2.848)], having good knowledge [AOR = 3.125, 95% CI (1.361, 7.178)], and having positive attitude [AOR = 2.279, 95% CI (1.09, 4.767)] were significantly associated with mask wearing practice.

Conclusion: more than half of the study respondents had good mask wearing practice regarding COVID-19 prevention. Having formal education, being employed, having good knowledge, and having positive attitude were significantly associated with mask wearing practice. It is recommended that local health authorities should implement interventions such, residents training and awareness creation activities to enhance residents to develop mask wearing practice.

Keywords: Mask-wearing practice, Factors, Metropolitan towns, Ethiopia

Introduction

Severe acute respiratory infection remains one of the leading causes of mortality around the world. The recent pandemic caused by an RNA virus that belongs to the family of CORONA virus is a challenge for both developed and developing countries. Coronavirus disease 2019 (COVID-19) is a respiratory tract infection caused by a newly emergent coronavirus, that was first recognized in Wuhan, China, in December 2019 [1]. The first case of COVID-19 in Ethiopia was detected in February 2020 involving one tourist from Japan. To date, there are more than 2750 positive COVID-19 cases recorded with at least 35 deaths in Ethiopia [2]. Most people with COVID-19 develop only mild or uncomplicated illness. But nearly, 14% develop severe disease that requires hospitalization and oxygen support and 5% require admission to an intensive care unit. In severe cases, COVID-19 can be complicated by the acute respiratory distress syndrome, sepsis and septic shock and multi-organ failure [3,4].

COVID-19 disease is spread mainly from person-to-person through respiratory droplets produced when an infected person coughs, sneezes, or talks. The virus is spread between people who are in close contact with one another [5]. Corona virus Disease, 2019 has been pandemic all over the world due to its strong human to human transmission. Chinese experience, shows that treats the infected patients properly, protects susceptible populations and cuts off transmission routes are proved to be a huge success in the fight against COVID-19. Non-pharmaceutical measures like wearing face masks are important to reduce the risk by establishing a barrier to curb the aerosol spread and protect susceptible populations [6,7]. Using face masks, washing hands, and social distancing were recommended by WHO for the prevention of transmission. Face masks use and respirators are strongly recommended by the World Health Organization and the Centers for Disease Control and Prevention as a standard for transmission-based safety measures. Given wide spread population vulnerability to COVID-19 infection, hand hygiene and face masks are repeatedly emphasized in the whole population [8,9].

Different countries are currently recommending non-medical face masks or homemade face coverings to be worn by the public when physical distancing cannot be maintained. These have been made largely due to the increasing recognition of the importance of pre-symptomatic and asymptomatic transmission and the potential benefit for source control [10,11].

At present, the main measures taken abroad to prevent COVID-19 in Ethiopia is wearing mask. The use of masks for the general public has been recommended as one of several COVID-19 pandemic mitigation strategies in Ethiopia [12]. However, there is a paucity of data on public mask wearing practice towards prevention of COVID-19. Thus, this study was aimed at assessing mask wearing practice and its associated factors for COVID-19 prevention among residents of metropolitan towns in Amhara region, Ethiopia.

Methods

Study Design and Period

A community-based cross-sectional study was conducted among residents of metropolitan towns in the Amhara region, Ethiopia from, June, 20 to July 10,200.

Study Area and Population

The study was conducted in metropolitan towns of Amhara National Regional State which is located 560 Kilometers Northwest of Addis Ababa, the capital city of Ethiopia. In the Amhara region, there are three metropolitan towns including, Bahir Dar the capital city of the region, Gondar town and Dessie town. The total population of the towns is 883,823 (regional states and chartered cities of Ethiopia, 2020).

Source Populations and Study Participants

All residents of the metropolitan towns were the source population and all randomly selected individuals who fulfilled the eligibility criteria were study participants.

Inclusions and Exclusions Criteria

Adults above the age of 18 years and who were permanent residents (greater than 6 months) of metropolitan town were included in the study, whereas adults who were unable to speak and heard, seriously ill during data collection and houses closed during data collection period were excluded from the study.

Study Variables

In this study, the dependent variable was mask wearing practice, whereas independent variables included sex, age, marital status, ethnicity, religion, educational status, occupational status, family size, monthly income, knowledge, attitude, source of information, chronic medical illness and presence of health professional in the household.

Operational Definitions

Metropolitan town: - large towns in Amhara region include Bahir Dar, Gondar and Dessie.

Mask wearing practice: a person who scored mean and above from the sixteen practice assessing questions were considered as having good mask wearing practice.

Knowledge: - residents who scored mean and above from the ten knowledge assessing questions were considered as having a good knowledge of mask wearing practice.

Attitude: - a person who scored mean and above from the eight attitudes assessing questions was considered as having a positive attitude towards mask wearing practice.

Sample Size Determination and Sampling Techniques

The sample size was determined based on the single population proportion formula: $n= [(Z\alpha/2)^2$

$P (1-p)]/d^2$ with the assumption of a 95% confidence interval ($Z\alpha/^2= 1.96$), marginal error (d) of 5% and P=50% with a 10% non-response rate, the required total sample size was 423. The proportional sample size was allocated for each metropolitan town. Systematic random sampling was used to select sample households that represent the entire town. The first household was selected by the lottery method. From the selected household, the study participant was chosen by the lottery method if more than one eligible individual present.

Data Collection Procedure

A structured questionnaire was adapted from similar literatures. The questionnaire was translated into the local language (Amharic) by persons who were proficient in both languages. Six experienced BSc in public health and two Environmental health were recruited for data collection and supervision, respectively. Data were collected through face-to-face interview administered method.

Data Management and Analysis

Data were cleaned, coded, and entered into EPI-DATA version 3.1 and exported to SPSS version 24 for analysis. Descriptive statistics such as frequency, percentage and median were used. Bi-variable binary logistic regression was carried out to identify candidate variables (p<0.25) for multivariable binary logistic regression analysis. Then multivariable binary logistic regression analysis was performed using those candidate variables to investigate statistically significant predictors of mask wearing practice by adjusting for possible confounders. Finally, Independent variables with P-values less than 0.05 from multivariable binary logistic regression were declared as statistically significant. An adjusted odds ratio with 95% confidence interval was used to assess the strength of associations.

Data Quality Assurance

To ensure the quality of this research training was given for two days. Then the questionnaire was pre-tested on a 5% of the total sample size in a Debretabour town and modified it accordingly. The whole data collection procedures were closely supervised by field supervisors and investigators on daily basis.

Ethical Clearance

The purpose and importance of the study were explained at all levels and written informed consent was obtained from the respondents. All respondents were assured that the data had not any negative consequences on any aspects of their life. Participants who were not willing to participate and want to withdraw at any step of an interview in the study would be informed to do so without any restriction. Both data collectors and supervisors adhered to the WHO and Ethiopian Ministry of Health COVID-19 prevention guidelines during data collection. The data collectors were given advice and health information about the benefit of mask wearing to the residents who had poor mask wearing practice.

Results

Socio-demographic Characteristics of Study Respondents

Four hundred thirteen residents were participated in the study with a response rate of 97.6%. Of the total respondents, 234 (56.6%) were females. The median age of the respondents was 39 years with an inter-quartile range of 11years. Two hundred twenty-nine (55.4%) respondents lay in the age group of 31-45 years (Table 1).

Knowledge, Attitude and Other Related Factors of Respondents

Of the total respondents, 314 (76%) had a good level of knowledge about mask wearing. Similarly, 282 (68.3%) of respondents had positive attitude about mask wearing practice towards COVID-19 prevention. Of the respondents, 137 (33.2%) heard information about mask wearing for the first time by television (Table 2).

Mask Wearing Practice of Respondents towards COVID-19 Prevention

This study showed that 236 (57.1%) (95%CI: 52.35-61.94%) of respondents had good mask wearing practice towards prevention of COVID-19. We used sixteen questions to assess the mask wearing practices of the respondents, of whom 85.2% said they wear mask in public places. Also, 62% of respondents reported they did not reuse single-use mask (Table 3).

Factors Associated with Mask Wearing Practice Towards COVID-19 Prevention

In the bi-variable binary logistic regression analysis; educational status, age, marital status, family size, occupational status, level of knowledge and attitude were factors associated with mask wearing practice at p-vale <0.25. Then multivariable binary logistic regression analysis was performed using those candidate variables. In the multivariable binary logistic regression analysis educational status, occupational status, level of knowledge and attitude were found to be significantly associated with mask wearing practice.

The odds of mask wearing practice of those respondents who had formal education were 5.114 (AOR: 5.114; 95% CI:3.174,8.241; p-value<0.001) times higher when compared to those who didn't have formal education.

The odds of mask wearing practice of those respondents who was employed were 1.827 (AOR: 1.827; 95% CI: 1.172, 2.848; p-value=0.008) times higher compared with those unemployed.

The odds of mask wearing practice of those respondents who had a good knowledge were 3.125 (AOR: 3.125; 95%CI: 1.361, 7.178; p-value=0.007) times higher compared with those who had poor knowledge.

The odds of mask wearing practice of those respondents who had a positive attitude were 2.279 (AOR: 2.279; 95% CI: 1.09, 4.767; p-value=0.029) times higher compared with those who had negative attitude (Table 4).

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Table 1: Socio-demographic characteristics of residents in metropolitan towns Amhara region, Ethiopia, June, 20-July, 10/2020.

Variable	Categories	Frequency (n=413)	Percentage (%)
Sex	Female	234	56.6
	Male	179	43.4
Ethnicity	Amhara	370	89.6
	Agew	32	7.7
	Others*	11	2.7
Age	18-30	141	34.1
	31-45	229	55.4
	>45	43	10.4
Education status	No formal education	148	35.9
	Primary education	109	26.4
	Secondary education	51	12.3
	above secondary	105	25.4
Marital status	Married	321	77.7
	Unmarried	92	22.3
Religion	Orthodox	356	86.2
	Muslim	49	11.9
	Others**	8	11.9
Family size	≤4	312	75.5
	>4	101	24.5
Monthly income	<2000	84	20.3
	2000-4000	160	38.7
	≥4000	169	40.9
Occupational status	Farmer	26	6.3
	Daily labor	28	6.8
	Housewife	54	13.1
	Merchant	87	21
	Student	31	7.5
	Employee	187	45.3

*Oromo and Tigre**protestant

Table 2: Knowledge, Attitude and other related factors of residents in metropolitan towns Amhara region, Ethiopia, June, 20-July, 10/ 2020.

Variables	Categories	Frequency (n=413)	Percentage (%)
Chronic medical illness	Yes	45	10.9
	No	368	89.1
Presence of health professionals in the household	Yes	65	15.7
	No	348	84.3
Source of information for mask wearing for the first time	Television/radio	137	33.2
	Telecommunication	47	11.4
	Social media	39	9.4
	Government	73	17.7
	Religious places	35	8.5
	Health professional/Peer	82	19.8
Level of knowledge	Good	314	76.0
	Poor	99	24.0
Attitude	Positive	282	68.3
	Negative	131	31.7

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Table 3: Mask wearing practice of respondents towards COVID-19 among Residents in Metropolitan Towns of Amhara Region, Ethiopia, June, 20-July, 10/ 2020.

Variables	Yes		No	
	N	%	N	%
Do you wear a mask in public places	352	85.2	61	14.8
Do you wear mask when you go out in the last seven days	235	56.9	178	43.1
Is mask available in your kebele	328	79.4	85	20.6
Have you used facemask during last seven days	298	72.2	115	27.8
Do not eat drink/smoke while wearing the mask	329	79.7	84	20.3
Do not removed his/her mask if there is a need to talk to persons	321	77.7	92	22.3
Have you cleaned your hands before doing a mask	304	73.6	109	26.4
Do you dispose the mask you have used in waste deposited container	312	75.5	101	24.5
Have you identified the inside and outside mask before wearing	242	58.6	171	41.4
Do you pull the top and bottom of the mask to extend the folds	257	62.2	156	37.8
Do you Press the noseband	256	62	157	38
Do not touch the mask that you wear	319	77.2	94	22.8
Dispose of the mask when soiled/wet	327	79.2	86	20.8
Do you clean hands after taking off	338	81.8	75	18.2
Not reuse single-use mask	256	62	157	38
Removed masks	323	78.2	90	21.8
Over all mask wearing practice score	Good		236 (57.1%)	
	Poor		177 (42.9%)	

Table 4: Multivariable binary Logistic Regression of community's masks wearing practice and Its Associated Factors in metropolitan towns of Amhara region, Ethiopia, June, 20-July, 10/ 2020.

Variables	Categories	Mask wearing practice		COR (95% CI)	AOR (95% CI)
		Good	Poor		
Age	18-30	79	62	1	1
	31-45	134	95	0.777 (0.506,1.194)	1.186 (0.741,1.899)
	>45	23	20	0.477 (0.239,0.952)	0.858 (0.396,1.858)
Family size	≤4	178	134	1	
	>4	58	43	0.985 (0.645,1.598)	1.037 (0.576,1.866)
Educational status	Formal education	192	73	6.217 (3.223,7.649)	5.114 (3.174,8.241) *
	Non-formal education	44	104	1	
Occupational status	Employed	121	65	1.813 (1.414,3.191)	1.827 (1.172,2.848) *
	Unemployed	115	112	1	1
Marital status	Married	179	142	1	
	Unmarried	57	35	0.774 (0.901,2.349)	1.004 (0.541,1.861)
Knowledge	Good	212	102	6.495 (3.874, 10.89)	3.125 (1.361,7.178) *
	Poor	24	75	1	
Attitude	Positive	196	86	5.185 (3.306,8.132)	2.279 (1.09,4.767) *
	Negative	40	91	1	

*significant at p-value < 0.05, 1=reference category

COR crude odds ratio, AOR adjusted odds ratio, CI confidence interval

Discussion

The finding of this study showed that the overall magnitude of good mask wearing practice was 57.1% (95%CI: 52.35-61.94%). This finding was consistent with studies conducted in Cameroon 60.8% [13] and India 60.05% [14]. This could be due to the effort of government and media in providing information starting from the time of the outbreak. Another reason could be due to prolonged exposure to information since it is global issue of discussion in the media and public.

However, it was higher than studies done in Addis Ababa 33.3% [15], Malaysia 51.2% [16], Pakistan 35.2% [17] and China 51.6% [18]. This might be due to differences in the socio-demographic features and study population. The other reason for the difference could be the study was

done during the active phase of the outbreak when participants of the public were exposed to a lot of information about the disease and under state of emergency.

It was also lower than studies done in Ethiopia which is multicenter study 67.3% [19] and Uganda 85.3% [20]. This discrepancy might be due to the culture, living condition and background of the people. The other reason might be also due to the difference in technology access and educational level between the study participants.

The current study identified that 76% of the community had good knowledge about mask wearing practice. The result was lower than the study conducted in Dessie, Ethiopia which in which 86.4% of them had good knowledge [21] and with the study conducted in Public

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Malaysia which accounted for 80.5% of the public participants were knowledgeable [16]. The difference might be due to different in the study period, study population, sample size determination and case definition. This result revealed that further awareness creation activities, providing information and training should be needed frequently to the community to gain knowledge related with COVID-19.

The results of the current study showed that 68.3% of the respondents in the community had positive attitude about mask wearing practice towards prevention of COVID-19. This result was higher than study conducted in Police Health Facilities of Addis Ababa, Ethiopia accounted for 45.3% of the health workers had a positive attitude [15]. This difference might be due to the issue of face mask use might disturb the community feelings. It was also lower compared to the studies done in Dessie Amhara Region Ethiopia which accounted for 76.4% of the health workers had a positive attitude [21]. This difference might be due to the difference in study population and study design and similarly, it was lower compared to the study done in Malaysian public which accounted 83.1% [16]. These discrepancies might be difference in study area, study population, tool and source of information.

Multiple binary logistic regression analysis of this finding showed that having formal education was significantly associated with good mask wearing practice. This is in agreement with the studies done in different countries [15,18,22]. This might be due to that education influences one's access to information and ability to comprehend health messages. Also, education helps to enhance awareness thereby enabling respondents to develop good behaviors to prevent COVID-19. This indicates that educating people is paramount importance in increasing the awareness of residents to practice prevention measures of COVID-19 including mask utilization.

In this study being employed was significantly associated with good mask wearing practice. The odds of mask wearing practice of those participants who was employed were about two times higher than those unemployed. This is similar to a previous study conducted in Mizan-Aman town [23] and Uganda [20]. The reason might be due to the presence of obligatory rules in Ethiopia that all employers should wear mask in their offices.

The odds of good mask wearing practice of those participants who had a good knowledge were about three times higher than those who had poor knowledge. It is supported by studies which reported that knowledge was significantly associated with practice [15,22]. This indicates that individuals with good knowledge demonstrated a more positive perception on preventive measures and would practice more preventive measures.

The odds of good mask wearing practice of those participants who had a positive attitude were about two times higher than those who had negative attitude. This is in agreement to a previous study [22]. This might be related to the fact that human behavior is influenced by perceptions and attitude which are the driving forces for activities. This study implied that creating positive attitude towards mask wearing practice, and its public health importance among community is vital in the prevention of the disease. The limitation of the study was since, its cross-sectional nature might affect the cause and effect relationship and rural residents were not addressed in the study.

Conclusion

More than half of the residents had good mask wearing practice towards COVID-19 prevention. Having formal education, being employed, having good knowledge, and having positive attitude were significantly associated with good mask wearing practice towards COVID-19 prevention. It is recommended that local health authorities should implement interventions such, residents training and awareness creation activities to enhance residents to develop mask wearing practice are needed.

Authors' contributions

Getahun Worku is the primary investigator, conceived the study, designed, conducted data analysis, interpreted the results, drafted and finalized the manuscript for publication. Belayneh Fentahun assisted in conducted

data analysis reviewed the initial and final drafts of the manuscript. All authors read and approved the final manuscript.

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