

Factors Associated with Practice of Covid-19 Precautionary Measures among Clients Visiting A Tertiary Hospital, Addis Ababa, Ethiopia

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Keywords: COVID-19, SARS-CoV-2, Attitude, Practice, Hospital, Ethiopia

Posted Date: July 13th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-666252/v1>

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Abstract

Background: Despite efforts to contain the COVID-19 virus, Addis Ababa, the country's COVID-19 epicenter, is experiencing a sharp increase in the number of cases and death rate. While poor public adherence to individual COVID-19 precautionary measures is evident, factors associated with it are not well studied. We aimed to assess the level of practice of COVID-19 precautionary measures and associated factors.

Methods: This was a hospital-based cross-sectional study conducted from February 1st to 15th, 2021 at Saint Paul's Hospital Millennium Medical College, a tertiary hospital in Addis Ababa. We used a structured questionnaire to conduct a face-to-face exit interview with randomly selected clients visiting the hospital. Binary and multivariable logistic regressions were implemented to examine factors associated with prevention practice.

Results: We analyzed data from 262 participants. The mean age of participants was 36(SD=12) years. The majority (207, 79%) of the study participants had a favorable attitude towards prevention and control measures of the disease. A little above half (116, 55.7%) of the respondents had a satisfactory level of practice of COVID-19 precautionary measures. Being a resident of the capital city [AOR: 2.25 (1.22-4.15)], and having a favorable attitude [AOR: (AOR: 4.88(2.08-11.68))] were significantly associated with satisfactory COVID-19 precautionary practice.

Conclusions: The level of COVID-19 precautionary practice was unsatisfactory. A favorable attitude and stricter enforcement of COVID-19 preventive measures were associated with adherence to precautionary practices. The findings highlight the need for a public health education strategy targeted at improving attitudes of the community on COVID-19 preventive practice.

Background

Since its emergence in December 2019, the coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has progressed into a pandemic (1, 2). Globally, as of May 11, 2021, there have been over 158 million confirmed cases including over 3 million deaths in Africa (3). The second-most populous African country, Ethiopia, and has reported over 260,000 confirmed cases and 3,888 deaths (4, 5). In Addis Ababa, the capital city, a sharp rise in high positivity rate, health facility admissions, and deaths were reported indicating a high community transmission (4). In the past year, the Ethiopian Ministry of Health (MoH) has implemented comprehensive COVID-19 prevention measures. Notably, the ministry enacted a directive that aimed to enforce COVID-19 Public Health and Social Measures (PHSM). Despite this effort, poor public adherence to precautionary measures seems to be a key factor in impeding efforts to slow the spread of COVID-19 (6). With only one percent of the country's population vaccinated as of May 11, 2021, and a growing concern of new COVID-19 variants, proper practice of precautionary measures remains the first line of defense (7).

According to the World Health Organization (WHO), engaging in the proper practice of precautionary behaviors including personal hygiene, wearing a face mask, and maintaining social distance, significantly contribute to controlling the spread of COVID-19 (6, 8). A multitude of factors affects the level of individual

prevention practice in a population. Among others, individual awareness, knowledge, attitude, and perception of risk are key in the adoption of precautionary practices (6, 8, 9). However, there is scarce evidence as to which of these factors contribute to a practical adoption and adherence to precautionary practices. The few studies conducted previously were limited to subsets of the population, particularly health care workers (10–12). Our study aimed to investigate the level and factors associated with COVID-19 prevention practice among clients visiting a tertiary hospital in Addis Ababa.

Methods

Study design and setting

This hospital-based cross-sectional study was conducted from February 1st to 15th 2021 at Saint Paul's Hospital Millennium Medical College (SPHMMC), in Addis Ababa. This tertiary hospital is the second-largest referral and teaching hospital in the country. Currently, it has an inpatient capacity of 700 beds and an average of 1,200 emergency and outpatient clients daily. The hospital is one of the few COVID-19 centers in the capital city and currently runs the largest COVID-19 treatment center in the country.

Study population and sampling

All clients visiting the hospital were the source population, of which randomly selected clients were included as a study population. Being an adult (> 18 years) was an inclusion criterion and history of COVID-19 infection was an exclusion criterion. A single population proportion formula with a marginal error of 5% ($d = 0.05$); and a standard score corresponding to 95% confidence was considered to determine the sample size. We calculated separate sample sizes for each of the two study objectives (level of practice and factors associated with practice). We took the prevalence (p) of the practice of 'hand washing' from a similar study (77.3%) (13) which yielded the maximum sample size of 270. After considering a 5% non-response rate, the final sample size for this study was 284 clients.

A systematic random sampling technique was used to identify respondents and conduct a face-to-face exit interview. The number of patients who visited the hospital's outpatient department on a daily basis three months before data collection was determined by consulting client register books. A sampling interval was determined by dividing the expected number of clients by the total sample size, which was then proportionally allocated to major departments in the hospital.

Study variables and measurement

COVID-19 precautionary measure was the dependent variable in this study, and the independent variables were divided into socio-demographic characteristics: age, gender, education, family size, marital status, and occupation; knowledge level and source of information on COVID-19 transmission, prevention, and control methods; attitude towards COVID-19 prevention, and control measures; perceived level of risk of contracting COVID-19 and presence of underlying chronic illnesses of the respondent or their family.

Bloom's cut-off point of > 80% on the aggregate score was adapted to rank respondents' overall knowledge, attitude, and practice scores (14). Practice, knowledge, and attitude were operationally defined as follows:

Satisfactory practice: a score of $\geq 80\%$ on nine items with a possible response and point score of “Always = 2”, “Occasionally = 1” and “Never = 0” assessing the practice of COVID-19 precautionary measures.

Adequate Knowledge: a score of $\geq 80\%$ on 19 items with a possible response and point score of “Yes = 1” or “No = 0” assessing the knowledge of COVID-19 prevention measures, transmission ways, and disease symptoms.

Favorable attitude: a score of $\geq 80\%$ on five, five point-Likert scale items with a response and point score of “Strongly agree = 5”, “Agree = 4”, “Neutral = 3”, “Disagree = 1” to “Strongly disagree = 0” assessing the attitude towards COVID-19 prevention and control measures.

Data collection

Data were collected by trained data collectors using a structured tool adapted from WHO’s COVID-19 knowledge, risk perceptions, precautionary behaviors survey tool (15). The tool was pre-tested on a sample of clients at a nearby Selam health center. The questionnaire was translated into Amharic (the local working language) and back to English to assess the consistency of meaning of items on the two tools. The Amharic version of the questionnaire was used for the interview.

Data analysis

The collected data were entered into Epi Info and exported to SPSS version 23 for analysis. Firstly, descriptive statistics such as frequency, proportion, mean and standard deviation were computed. Then, binary logistic regression analysis was implemented to examine factors associated with prevention practice. Variables with a p-value of 0.25 or lower on binary analysis were further analyzed in a multivariable logistic regression model. Odds ratio with 95% Confidence Interval (CI) was used to test significance association.

Ethical consideration

Ethical clearance was obtained from SPHMMC Institutional Review Board. The participants were informed on the purpose of the study, confidentiality, voluntary participation, anonymity, and withdrawal. Oral informed consent was obtained from all the respondents.

Results

Socio-demographic characteristics

A total of 284 clients were initially approached for an interview. After excluding those who refused to participate and those with incomplete responses, 262 (92.2%) respondents were included in the final analysis. The mean age of participants was 36 (± 12) years. [Table 1]

Table 1
Socio-demographic characteristics of respondents

Characteristics	Frequency	Percentage
Age		
18–29	86	32.8
30–49	131	50
50–70	45	17.2
Sex		
Male	140	53.4
Female	122	46.6
Religion		
Orthodox	141	53.9
Muslim	60	22.9
Protestant and Jehovah's witness	61	23.2
Marital Status		
Single	91	34.7
Married	156	59.5
Divorced, Widowed or Separated	15	5.8
Educational status		
Unable to read and write	17	6.5
Able to read and write	12	4.6
Primary (1-8th grade)	35	13.4
Secondary (9-12th grade)	90	34.3
College and above	108	41.2
Occupational status		
Employed	252	96.2
Unemployed	10	3.8
Place of residence		
Addis Ababa (capital city)	146	55.7
Out of Addis Ababa	116	44.3

Perceived risk of COVID-19

Just above a third (101, 38.5%) of the respondents reported that they had a chronic illness; diabetes was the most commonly reported (35, 34.6%). The majority (79.8, 50.8%) of the respondents perceived their level of risk of contracting COVID-19 was “low” or “medium”. [Table 2]

Table 2
Perceived risk of COVID-19 among respondents

Characteristics	Frequency	Percentage
Do you have a chronic illness? (n = 262)		
Yes	101	38.5
No	155	59.2
I do not know	6	2.3
What is your chronic illness? (n = 101)		
Heart disease	11	10.9
Hypertension	30	29.7
Diabetes	35	34.6
Other*	25	24.8
High-risk family member (elderly, with chronic illness) (n = 262)		
Yes	81	30.9
No	181	69.1
Perceived level of risk for contracting COVID 19 (n = 262)		
High	73	27.9
Medium	133	50.8
Low	52	19.8
I do not know	4	1.5
*asthma, epilepsy, kidney disease and cancer		

Knowledge of COVID-19 transmission and prevention

Close to a third of the respondents (82, 31.3%) reported that eating homemade spices such as ginger was protective of COVID-19. The overall knowledge score showed that just over half (139, 53.0%) of the respondents had adequate knowledge of COVID-19 mode of transmission, symptoms, and prevention methods. [Table 3]

Table 3
Knowledge of COVID-19 prevention, symptoms, and transmission among respondents

Characteristics	Frequency	Percentage
Primary source of information about COVID-19		
TV/radio	246	93.9
Health professional	141	53.8
Social media	122	46.6
Family/friends	77	29.4
Other (newspapers and religion institutions)	6	2.3
Ways of COVID-19 transmission		
Respiratory droplets of infected person	206	78.6
Direct contact with infected person	250	95.4
Indirect contact through infected surface	12	4.6
Main symptoms of COVID-19		
Fever	213	81.3
Fatigue	115	43.9
Dry cough	230	87.8
Sore throat	126	48.1
Headache	29	11
Other*	39	14.8
Modes of prevention of COVID-19		
Avoid crowded places	97	37
Keep physical distance to a minimum of 2 meters	148	56.5
Wear a mask	242	92.4
Avoided shaking hands	190	72.5
Wash hands with water & soap for at least 20 seconds	191	72.9
Clean hands with alcohol-rubbing or sanitizer	165	63
Cover mouth/nose with elbow when coughing/sneezing	65	24.8

*chills, shortness of breath, joint pain, and sneezing

**drink hot beverages, wear gloves, consume a balanced diet, and get vaccinated

Characteristics	Frequency	Percentage
Not touch eyes, nose, or mouth with unwashed hands	65	24.8
Clean repeatedly touched surfaces	26	9.9
Other**	8	3.05
Eating homemade spices such as ginger is protective of COVID-19	82	31.3
Infected persons cannot transmit the disease if they have no cough	26	9.9
There is no need for a suspected person to be quarantined	9	3.4
Level of knowledge		
Adequate knowledge	139	53
Inadequate knowledge	123	47
*chills, shortness of breath, joint pain, and sneezing		
**drink hot beverages, wear gloves, consume a balanced diet, and get vaccinated		

Attitude towards COVID-19 prevention and control measures

Most (115, 43.9%) of the respondents felt that they had a role in reducing the spread of COVID-19. Overall, the majority (207, 79%) of the study participants had a favorable attitude towards control and prevention measures of the disease. [Table 4]

Table 4
Attitude of respondents towards COVID-19 prevention and control measures

Characteristic	Frequency	Percentage
If I were infected with COVID-19, I would self-isolate		
Strongly agree	134	51.1
Agree	119	45.4
Neutral	8	3.1
Disagree	0	0
Strongly disagree	1	0.4
I am willing to do a voluntary test for COVID 19		
Strongly agree	115	43.9
Agree	90	34.4
Neutral	20	7.6
Disagree	26	9.9
Strongly disagree	11	4.2
As an individual, I have a role in reducing the spread of the COVID-19		
Strongly agree	126	48.1
Agree	104	39.7
Neutral	20	7.6
Disagree	12	4.6
Strongly disagree	0	0
If I were infected with COVID-19, I would disclose my status to relatives, friends, or colleagues		
Strongly agree	117	44.7
Agree	104	39.7
Neutral	20	7.6
Disagree	10	3.8
Strongly disagree	11	4.2
Whether young or old, everyone should equally implement COVID-19 prevention practice		
Strongly agree	162	61.8

Characteristic	Frequency	Percentage
Agree	86	32.8
Neutral	5	1.9
Disagree	9	3.4
Strongly disagree	0	0
Level of attitude		
Favorable	207	79
Unfavorable	55	21

COVID-19 precautionary practice

Most (190, 72.5%) of the respondents reported that they always wore face masks when going outside of their house. The overall practice score showed that just above half (116, 55.7%) of the respondents had a satisfactory practice of COVID-19 precautionary measures. [Table 5]

Table 5
COVID-19 prevention practice among respondents in the preceding two weeks

Characteristics	Frequency	Percentage
Avoided going to crowded places or social gatherings		
Always	64	24.4
Occasionally	151	57.6
Never	47	17.9
Wore facemask when leaving home		
Always	190	72.5
Occasionally	70	26.7
Never	2	0.8
Avoided shaking hands with other people		
Always	119	45.4
Occasionally	117	44.7
Never	26	9.9
Washed hands with water and soap for at least 20 seconds		
Always	113	43.1
Occasionally	121	46.2
Never	28	10.7
Kept physical distance to a minimum of 2 meters		
Always	30	11.5
Occasionally	134	51.1
Never	98	37.4
Avoided touching eyes, nose or mouth before washing hands		
Always	74	28.3
Occasionally	147	56.1
Never	41	15.6
Covered mouth and nose when coughing or sneezing		
Always	118	45
Occasionally	113	43.1

Characteristics	Frequency	Percentage
Never	31	11.8
Cleaned hands with alcohol-based sanitizer		
Always	93	35.5
Occasionally	132	50.4
Never	37	14.1
Disinfected mobile phone or personal articles with sanitizer		
Always	68	26
Occasionally	99	37.8
Never	95	36.2
COVID-19 practice level		
Satisfactory	116	55.7
Unsatisfactory	146	44.3

Factors associated with COVID-19 prevention practice

The binary analysis outputs showed that respondents who had primary school education had greater odds of poor practice as compared to those with no formal education (Crude odds ratio (COR) 0.32 (0.14–0.76)). And those who had a better knowledge of COVID-19 had greater odds of practice of satisfactory precautionary measures (COR 1.93 (1.17–3.17)). However, after multivariable analysis, only the place of residence of Addis Ababa (Adjusted odds ratio (AOR): 2.25 (1.22–4.15)) and favorable attitude towards COVID-19 prevention and control measures (AOR: 4.88 (2.08–11.68)) were significantly associated with practice. [Table 6]

Table 6
Factors associated with COVID-19 prevention practice in regression analysis

Characteristics	Practice		COR (95% CI)	AOR (95% CI)	P-value
	Satisfactory	Unsatisfactory			
Marital status					
Single	33(36.3)	58(63.7)	1.14 (0.36–3.61)	2.85(0.51–15.92)	0.233
Married	78(50.0)	78(50.0)	2(0.65–6.12)	3.27(0.62–17.20)	0.163
Divorced/separated/windowed	5(33.3)	10(66.7)	1	1	
Educational Status					
No formal education	18(62.1)	11(37.9)	1	1	
Primary	15(42.9)	20(57.1)	0.46(0.17–1.25)	0.33(0.09–1.22)	0.097
Secondary	31(34.4)	59(65.6)	0.32(0.14–0.76)	0.40(0.12–1.29)	0.125
College and above	52(48.1)	56(51.9)	0.57(0.25–1.31)	0.40(0.13–1.29)	0.126
Place of residence					
Addis Ababa	81(55.5)	65(44.5)	2.88(1.73–4.82)	2.25(1.22–4.15)*	0.009
Out of Addis Ababa	35(30.2)	81(69.8)	1		
High risk family member (elderly, with chronic illness)					
Yes	23(28.4)	58(71.6)	0.38(0.21–0.66)	0.88(0.44–1.79)	0.73
No	93(51.4)	88(48.6)	1	1	
Self-rate of level of risk of contracting COVID 19					
High	32(43.8)	41(56.2)	2.34(0.23–23.59)	4.1(0.36–48.77)	0.254
Medium	51(38.3)	82(61.7)	1.87(0.19–18.43)	5.26(0.46–60.74)	184
Low	32(61.5)	20(38.5)	4.8(0.47–49.39)	9.49(0.79–114.72)	0.077
I don't know	1(25)	3(75.0)	1	1	

Characteristics	Practice		COR (95% CI)	AOR (95% CI)	P-value
	Satisfactory	Unsatisfactory			
Knowledge of COVID-19 mode of transmission, symptoms and prevention					
Satisfactory	72(51.8)	67(48.2)	1.93(1.17–3.17)	1.14(0.6–2.16)	0.697
Unsatisfactory	44(35.8)	79(64.2)	1	1	
Attitude towards COVID-19 prevention and control					
Favorable	108 (52.8)	99 (47.8)	6.4(2.88–14.23)	4.88(2.08–11.68)*	< 0.0001
Unfavorable	8 (14.5)	47 (85.5)	1		

Discussion

Just above half (55.7%) of the study participants had satisfactory COVID-19 prevention practices. The face mask was the most commonly utilized precautionary method. More than two-thirds of the respondents reported they always wore a face mask. This was in line with the knowledge assessment result where almost all of the respondents mentioned face masks as the primary means of prevention. This was also in agreement with previous studies that reported a positive association between COVID-19 knowledge and utilization of face masks (16). However, according to WHO, the use of a mask alone is insufficient to provide an adequate level of protection and must be combined with hand hygiene to prevent transmission of COVID-19 (17). In the present study, hand hygiene practice was low, as less than half of respondents reported washing hands with water and soap, and only a third reported using sanitizers. On top of this, hand hygiene practice levels are declining as compared to a year ago at the start of the pandemic (13, 18). This finding might indicate that inadequate hand hygiene might be hindering the effort to slow the spread of the virus.

In this study, the lowest score on COVID-19 precautionary measures was for social distancing; only a quarter of the respondents avoided crowded places or social gatherings, and a mere one-tenth maintained physical distance. This finding also markedly showed a decline as compared to previous studies (19). A multitude of factors can explain the poor adherence. For one, the odds of not adhering to all social distancing rules increases if a participant does not self-identify as highly vulnerable to COVID-19 (18, 19). Congruently, in this study, less than a third of the respondents perceived their risk of infection as high, indicating a lower perceived vulnerability. Another possible explanation could be that maintaining social distance may not be always entirely possible due to living in crowded areas (19) and use of public transportation, leading to unintentional non-adherence of social distancing guidelines (20).

The KAP (Knowledge, Attitude, and Practices) theory states that for the adoption and formation of new behavior, both the acquisition of knowledge and generation of attitude is important (21). In this study, a favorable attitude towards COVID-19 preventive measures was strongly associated with good practice. Likewise, previous studies have reported positive attitude had a significant and robust impact on preventive behavior (6, 19, 22, 23). For instance, participants who felt COVID-19 will be successfully controlled were more likely to refrain from handshaking (13). Similarly, a favorable attitude predicted the intention of handwashing, one of the key precautionary measures against COVID-19 (22). This finding might have implications for the adoption of public health education strategies targeted at improving attitude among a segment of the community with poor practice.

In this study, as compared to being from outside the capital city, being a resident was associated with better practice. The possible explanation for this could be the relatively strict enforcement of COVID-19 Public Health and Social Measures (PHSM) in the city as compared to parts of the country (4). For instance, a mandatory face mask is a requirement to receive any public service in the city. This finding was in agreement with studies that reported implementation of a mask mandate led to widespread uptake of masks (24, 25). This result highlights the possible implication of strong regulations on improving compliance with COVID-19 precautionary measures.

This study has several limitations. The study population was clients attending a hospital and might not be representative of the general public, and might have affected variables such as the level of the perceived risk of COVID-19, which might be higher among patients. The study assessed prevention practice based on self-report, which might have inflated the true extent among the respondents. Due to the study design implemented, it is not possible to assess whether risk factors modified practice or changed as a result of practice.

Conclusion

The level of COVID-19 precautionary practice was unsatisfactory. Having the right attitude towards COVID-19 precautionary measures had a strong association with COVID-19 precautionary practice. Stricter public enforcement of COVID-19 preventive measures might have contributed to better adherence to precautionary measures. Public health education strategies targeted at communicating the effectiveness of good practice for the prevention of COVID-19 spread might be beneficial.

Abbreviations

AOR: Adjusted Odds Ratio; CI: Confidence Interval; COVID-19: Coronavirus Disease; COR: Crude Odd Ratio; MoH; Ministry of Health; PHSM: Public Health and Social Measures; SPHMMC: Saint Paul's Hospital Millennium Medical College; Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and WHO: World Health Organization (WHO)

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from the institutional review board of SPHMMC. All respondents underwent informed consent for participation in the study.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests

Funding

Funding was obtained from SPHMMC's research resource mobilization and project management directorate. The study's sponsors had no role in study design, the collection, analysis, interpretation of data, or manuscript preparation.

Authors' Contributions

HB conceived designed the study, interpreted data, and prepared the manuscript. SM prepared data a collection instrument, analyzed data, and AY analyzed, interpreted data, and reviewed the manuscript. All authors read and approved the final manuscript.

Acknowledgments

The authors would like to thank data collectors and study participants for gathering and providing information.

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