

Adherence with COVID-19 Preventive Measures and Associated Factors Among Residents of Shashemane, Central Ethiopia

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Abstract

Introduction:

Covid 19 pandemic can seriously affect African nations because of the weak health care system, crowding, poor hygiene in the cities, and the random mobility of people. Hospital-based interventions are not a good choice for resource-scarce countries which have shortages of hospital beds, ventilators, and oxygen; rather practicing preventive measures at a community level is the best strategy. There is a shortage of evidence about current public adherence with COVID-19 preventive strategies in Ethiopia, therefore this study helps to target health education messages to groups of populations with poor compliance to specific prevention measures, which also contribute to decreasing the magnitude and duration of the pandemic.

Methods:

A Community based cross-sectional study was done on 405 participants selected by systematic random sampling in Shashemane. Data was collected using A pretested structured tool comprising socio-demographic characteristics, knowledge, attitude, and adherence with COVID-19 prevention practice. Participants who practiced $\geq 75\%$ of the COVID-19 preventive practices were labeled as having "good adherence". Bivariate and multivariable logistic regression was used to determine the associated variables. Odds ratios along with 95%CI were estimated to identify associated factors and a level of statistical significance was decided at p-value less than 0.05.

Result:

The practice of COVID-19 preventive measures was 19.5%, (95% CI: 15–24.5%). Having a favorable attitude (AOR = 5, 95% CI: 3.3–8.41), having good knowledge of the disease (AOR = 3, 95% CI: 2.74– 9.3) and educational status (Diploma and above) (AOR = 5.5, 95% CI: 2– 9.39) were significantly associated factors with the practice of COVID-19 preventive measures.

Conclusion:

The Adherence to COVID-19 preventive practices was very low, educational status above Diploma, good knowledge, and Favorable attitude were the factors positively and independently associated with good adherence to Covid-19 prevention practices. Behavioral change communication and Strict government law and implementing it are highly required.

Introduction

COVID-19 infection is primarily transmitted by the direct mucus contact with the breath, ingestion, salivary droplet of an infected individual that can live on hands, surfaces, or objects [1–3]. The rapid worldwide spread of COVID-19 forced the World health organization to declare the COVID-19 pandemic as a public health emergency of international importance by January 2020. This kind of decision is made when an incident with major public health implications crosses the boundaries of the nation's initially affected, requiring immediate international action [4]. Up to September 10, 2021, there have been 224,383,843 worldwide confirmed cases of COVID-19 and 4,625,768 deaths. [5], Out of which 7,993,715 Cases are from Africa with 202,042 Deaths [6] and In Ethiopia, there have been 320,453 confirmed cases with 4,857 deaths [7].

WHO strictly recommended COVID-19 prevention approaches such as keeping physical distance, wearing a face mask, avoiding going to crowded places, hand washing, making rooms ventilated, and covering nose and mouth while sneezing or coughing, avoiding closer contact with animals and suspected area with coronavirus infections, and avoiding consumption and handling of raw meat to prevent cross-contamination [8–11]

Experts believed Covid 19 pandemic can seriously affect African nations because of the weak health care system, crowding, poor hygiene in the cities, and the random mobility of people can make the epidemic out of control. [12, 13]. Global experts and African governments have articulated their concern regarding the transmission of COVID-19 and projected that over two million deaths might happen in sub-Saharan Africa if immediate action is not taken [14].

The pandemic is challenging both for developed and developing nation's healthcare system, social, economic, and psychological wellbeing of humanity. For countries with hospitals and clinics that were already overburdened before covid-19, practicing preventive measures at a community level is the best strategy. Hospital-based interventions are not a good choice for resource-scarce countries which have limited personal protective devices, shortages of hospital beds, ventilators, and oxygen. [15, 16].

Ethiopia has an underprivileged public health system and sectors, limited infrastructure, inadequate number of hospitals, little capacity for tracing, diagnosing, isolation, and management of cases [17], therefore more focus should be given on prevention strategies.

There is a shortage of evidence about current public adherence with COVID-19 preventive strategies in Ethiopia, therefore this study helps to target health education messages to groups of populations with poor compliance to specific prevention measures, which also contribute to decreasing the magnitude and duration of the pandemic

Methods And Materials

Study Area

The study was done in Shashamane Town, one of the towns in the Oromia national Region, in west Arsi zone. Shashamane is located at south of Addis Ababa about 250 km. The town lies roughly 70° 08' 51"N to 70° 18' 19"N latitude and 38° 03' 24"E to 38° 04' 07"E longitude. The town is located at the upper greatest east African rift valley. It has a sub-tropical middle land climatic zone. Agriculture is the likelihood of the majority of the study population.

Sample size determination

The single population proportion formula was used to calculate the sample size by considering a study conducted at Direedawa which revealed covid 19 prevention practice of 40.7 % (18) and using 95% confidence interval, 0.05 margin of error, and a 10% non-response rate. The final sample size was **407**.

Sampling Procedure

From the seven sub-cities of Shashemane, three were selected using a simple random sampling method, and then 407 participants were selected by systematic random sampling technique, using the sampling frame of households from the 3 sub-cities. The total number of households was proportionally allocated to (Abosto, bulchana and Arada sub cities) based on the number of households within each of them. Any individual who was a resident of the area, age over 18 years old, and who are healthy were included. Study variables include - Age of the Participant, Sex, marital status Occupation, Educational status, Average monthly Income, Family size, Source of information.

Instrument and Outcome measurement

We developed the questionnaire based on a literature review and adapted it from WHO resources. It includes sociodemographic information, behavioral characteristics, knowledge, attitude, and practices towards COVID-19 prevention actions (19-21,24). The attitude variable was converted into a dummy variable of unfavorable and favorable attitudes. For each item participants who answered (a) strongly disagree, (b) disagree, or (c) neutral were combined into one group and categorized as an unfavorable attitude" and those participants who responded (d) agree or (e) strongly agree were labeled as having "favorable attitude". Overall, the attitude was generated from the dummy variables created from the Likert scale items and those participants who had "favorable attitude" for all the attitude questions were grouped as "favorable attitude" and all else were categorized as "unfavorable attitude". (24) Regarding the participants' adherence, those who practiced $\geq 75\%$ of the COVID-19 preventive practices were labeled as having "good adherence"

Also, there were 12 (twelve) **knowledge** measuring questions, in which each question scored 0 and 1 (0 = No, 1 = Yes). We considered those study participants who scored below the mean value out of twelve questions as they have poor knowledge and those who scored a mean and above the mean value as they have good knowledge (18).

Data collection, management, and analysis

Socio-demographic data was cleaned manually and entered into the computer using Epidata version 3.3 and statistical analysis was made using SPSS version 25, whereas, Descriptive summary (Frequency distribution, proportion, mean & standard deviation) was used to summarize the variable. Continuous variables like age and income were first transformed into categorical variables before they were analyzed. First, the frequency of all the variables in the questionnaire was determined. Bivariate & multivariable logistic regression was done to assess the association of factors with Adherence to covid-19 prevention measures, by calculating odds ratios, their 95% confidence limits, and P-value less than or equal to 0.05 was taken as statistically significant. Important variables were entered and analyzed using multivariable logistic regressions to control for confounding variables. All the assumptions of regression analysis (model adequacy and multi-co linearity of independent variables) were checked to be satisfied using appropriate methods.

Data quality control

Data quality control was ensured by conducting a pretest on about 5% of the sample size that was randomly selected from participants out of the study population and then the data were checked for internal consistency and modifications were made accordingly.

Ethical Considerations

An ethical Approval Letter was taken from Paradise college. Informed consent was obtained from each respondent and they were told to have the full right to give up the interview any time he/she wishes. The purpose of the research was well communicated and never exposed the privacy of the participants. A consent paper was prepared and participants gave consent before the data collection started.

Results

Socio-Demographic Characteristics

Out of 407 study participants initially sampled in the study, 405 have participated, making a response rate of 99%. The mean (\pm SD) age of the study participants was (32.5(\pm 14.4) years with a minimum age of 18 years and maximum age of 64 years. About 50 % of participants are young adults (age 18-35 years), 22% are middle-aged adults (ages 36-55 years), and the rest 28 % are older adults. (Table 1)

Table 1: Socio-economic and demographic characteristics of Study Participants in Shashemane, Central Ethiopia, 2021 (n=405)

Variable		Frequency	Percent
Age in years 18-35		201	49.6
36-55		89	22
> 56		115	28.4
Sex	Male	242	59.7
	Female	163	40.3
Marital status	Married	293	72
	Single	87	21.4
	Widowed	14	3.4
	Separated	11	2.7
Family size	< 5	153	37.8
	≥5	252	62.2
Occupational	Government org.	108	26.6
	Marchant	103	25.4
	House wife	52	12.8
	Private org.	66	16.3
	Student	37	9
	Other	39	9.6
Educational status	No formal education	120	29.6
	Can read and write	100	24.6
	Primary school	79	19.5
	Secondary school	59	14.5
	Diploma&+	46	11.3
Average Household Income per month			
< 5000 ETB		270	66.7
5000-10,000 ETB		116	28.6
>10,000 ETB		19	4.7

Knowledge About COVID-19

Only about 29 % of the participants know as Asymptomatic person could transmit COVID-19, about 36% of the participants know as stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus. (Figure-1)

Attitude of Participants Towards COVID-19

57.7% of the participants have unfavorable attitude towards Covid-19. 52.3% of the participants believed that hand washing can prevent or reduce transmission of COVID-19. (Table 2)

Table 2: Attitude of Study Participants About COVID-19 Prevention Measures in Shashemane, Central Ethiopia, 2021 (n=405)

Item	Favorable %	Unfavorable %
Do you think that COVID-19 disease is dangerous?	23.6	76.4
Do you believe that hand washing can prevent/reduce transmission?	52.3	47.7
Do you think that wearing a mask will prevent/decrease transmission?	51.7	48.3
Do you think that using alcohol/sanitizers decrease transmission?	42.4	57.6
Do you think to stay at home/avoid going to crowded places prevent transmission?	52.3	47.7
Do you think that keeping social distance will prevent transmission?	39.8	61.2
Do you agree that COVID-19 will finally be successfully controlled?	65.4	34.5
Do you think eating wild animals will transmit the disease?	29.7	70.3
Do you think Ethiopia can win the battle against the COVID-19 virus?	32.5	67.5

Adherence with COVID-19 Preventive practices

Only 19.5%, (95% CI: 15–24.5) of the participants had a good practice on prevention methods of COVID-19. About 48% of the participants wear face Mask consistently when they go out of home (Figure-2)

Factors Associated with Adherence of COVID-19 Prevention Practices

After running the multivariable analysis; attitude, knowledge, and Educational Status are associated with COVID-19 preventive practices adherence. The odds of Adherence with COVID-19 preventive measures were 5 times (AOR = 5, 95% CI: 3.3 – 8.41) higher among participants whose attitude is favorable as compared to those who have unfavorable attitudes. The odds of Adherence with COVID-19 preventive measures were 3 times (AOR =3, 95% CI: 2.74– 9.3) higher among participants who had good knowledge of the disease as compared to those who have poor Knowledge. The odds of Adherence with COVID-19 preventive measures were about 5.5 times higher (AOR =5.5, 95% CI: 2– 9.39) among participants whose educational status is Diploma and above as compared to those who have no formal education.

Table-3: Factors associated with Adherence with COVID-19 Preventive Measures Among Residents of Shashemane, Central Ethiopia September 2021, (n=405).

Variables		Adherence		COR (95% CI)	AOR (95%CI)
		Good Adherence Yes	No		
Age	18-35	15(7.4%)	186(92.6%)	1	1
	36-55	22(24.7%)	67(75.3%)	4.3(2.4-8.9)	1.8(0.3-6.9)
	56 & above	42(36.5%)	73(63.5%)	7 (4.4-13.87)	4(1.75-16)
Educational status	No formal-edu	5(4%)	115(96%)	1	1
	Read & write	13(13%)	87(87%)	3.43(2.2-7.6)	2.8(1.5-11)
	Elementary	14(17%)	65(82%)	4.95(2.7-8,9)	3.5(2-8.35)
	High school	18(30.5%)	41(69.5%)	10(3.7-18)	4(2.8-7)
	Diploma&+	29(63%)	17(33%)	39(18-42.48)	5.5(2-9.39) **
Sex	Female	51 (31%)	112 (69%)	3.4 (1.8-5.45)	1.7 (1.28- 6.2)
	Male	28 (11%)	214 (89%)	1	1
Occupation	Government	32 (29%)	76 (71%)	1	1
	Marchant	22(21%)	81(79%)	0.64 (0.02-0.87)	0.5(0.2 – 0.87) *
	House wife	4(7.6%)	48(92.4%)	0.2 (0.04-3.27)	0.18(0.06-0.45)
	Private org	11(16.6%)	55(83.4%)	0.475 (0.24-0.74)	0.3(0.17- 0.56)
	Student	8(21%)	29(79%)	0.65(0.32- 0.94)	0.3 (0.2- 0.67)
	Other#	2(5%)	37(95%)	0.12(0.08-0.3)	0.06(0.6-5.7)
Knowledge	Good	57(7.2%)	101(92.8%)	5.7(3.8-8.63)	3(2.74-9.3) ***
	Poor	22(8.9%)	225(91.1%)	1	1
Attitude	Unfavorable	17(%)	217(%)	7.2(1.84-10.89)	5 (3.3-8.41) * **
	Favorable	62(%)	109(%)	1	1

* Significant at P = <0.05, * * Significant at P = < 0.002, * ** Significant at P = < 0.001, OR =Odd ratio, AOR=Adjusted odd ratio, CI= Confidence interval

Discussion

Adherence to the preventive measures is the most important intervention for covid-19 throughout the world and most importantly in resource scare countries, the study investigated this and comes up with a very low level of adherence with the practice of COVID-19 prevention measures, only 19.5%, with (95% CI: 15–24.5). This magnitude of good practice of Covid preventive measures was lower than studies conducted in Diredawa (40.7% (18), Gonder (51%) (22), and south Ethiopia 20% (23) and higher than a study conducted at Dirashe district (12.3%) (24). When we compare it with other African countries it is much lower than cross-sectional studies conducted in Nigeria 41.6% (25), Cameron (60.8%) (26), Burkina Faso (39%) (27), and A nationwide cross-sectional Survey at Ugandan (85.3%) (28). The difference could be attributed to the period the studies were conducted, the type of study participants, and the different levels of awareness creation and other interventions done at the study areas.

We have found that educational status positively impacts the practice of our study participants. Study participants who have a diploma and above had a good level of practice to prevent the pandemic compared with those who have no formal education. This was in agreement with a study finding from A Community-Based Cross-Sectional Study conducted at Gedeo zone (29), Debre Tabor Town Northwest Ethiopia (30), northern Thailand (31), Nigeria (32), and Iran (33). This might be because more educated people can access information from different sources like the internet easily and discuss openly, usually more educated are working at different types of organizations where there is strict rule and provision of different Covid-19 prevention materials and information.

Participants who had good knowledge on the mode of transmission and prevention mechanisms of COVID-19 had a better practice of precautionary measures (p value < 0.00), and this result is consistent with researches conducted at Dire Dawa residents (18), Amhara region (34) and Addis Ababa (35). Knowledge is the main modifier of attitudes that can lead to a better practice of COVID-19 preventive measures, one cannot have a good practice without adequate knowledge of the disease, what to do and what not to do. Knowledge about COVID-19 disease nature, signs and symptoms, mechanisms and modes of spread, and how to avoid the infection will increase the prevention practice of individuals.

This study revealed that the Attitude of participants is strongly associated with COVID-19 preventive measures. Favorable attitudes towards COVID-19 preventive approaches were significantly associated with good adherence towards COVID-19 prevention measures. This finding is in line with other studies conducted in Gonder (22), Jimma (36) Addis Ababa, Ethiopia (37), However, Attitude is not permanent, enhancing a positive attitude towards preventive practice should be performed to make it sustainable among the population.

The findings of knowledge, attitude, and practices are alarming, we cannot change attitude and practice only by giving information a strong health education targeting behavioral change by different teaching methods and materials should be strengthened, Strict government rules and implementing it is required. The impact of the pandemic is to all countries but developing countries like ours can be massively affected, Human day-to-day activities including the economy and health care systems will be more affected unless this poor adherence to covid-19 prevention measures is improved (38,39).

Conclusion

Adherence to COVID-19 preventive practices was very low, educational status above Diploma good knowledge and Favorable attitude were the factors positively and independently associated with good adherence of Covid-19 prevention practices. Behavioral change communication and Strict government law and implementing it are highly required.

Declarations

Data Sharing Statement

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

Ethical Approval and Consent to Participate

The study was conducted in accordance with the Declaration of Helsinki. Ethical approval was received from Paradise Valley College. Verbal consent was obtained from each respondent before actual data collection. Issues of confidentiality were maintained by removing any identifiers from the questionnaire. The participants were informed of their right to participate and leave the study at any point in time.

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Author Contributions

AT was involved in the conception of the study. All authors made a significant contribution to the work reported, on study design, execution, analysis, and interpretation, took part in drafting, revising, and critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest for this work.

Abbreviations

AOR- adjusted odds ratio; COVID-19- coronavirus 2019;; SPSS, Statistical Package for Social Science; US, United States of America; WHO, World Health Organization.

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Figures

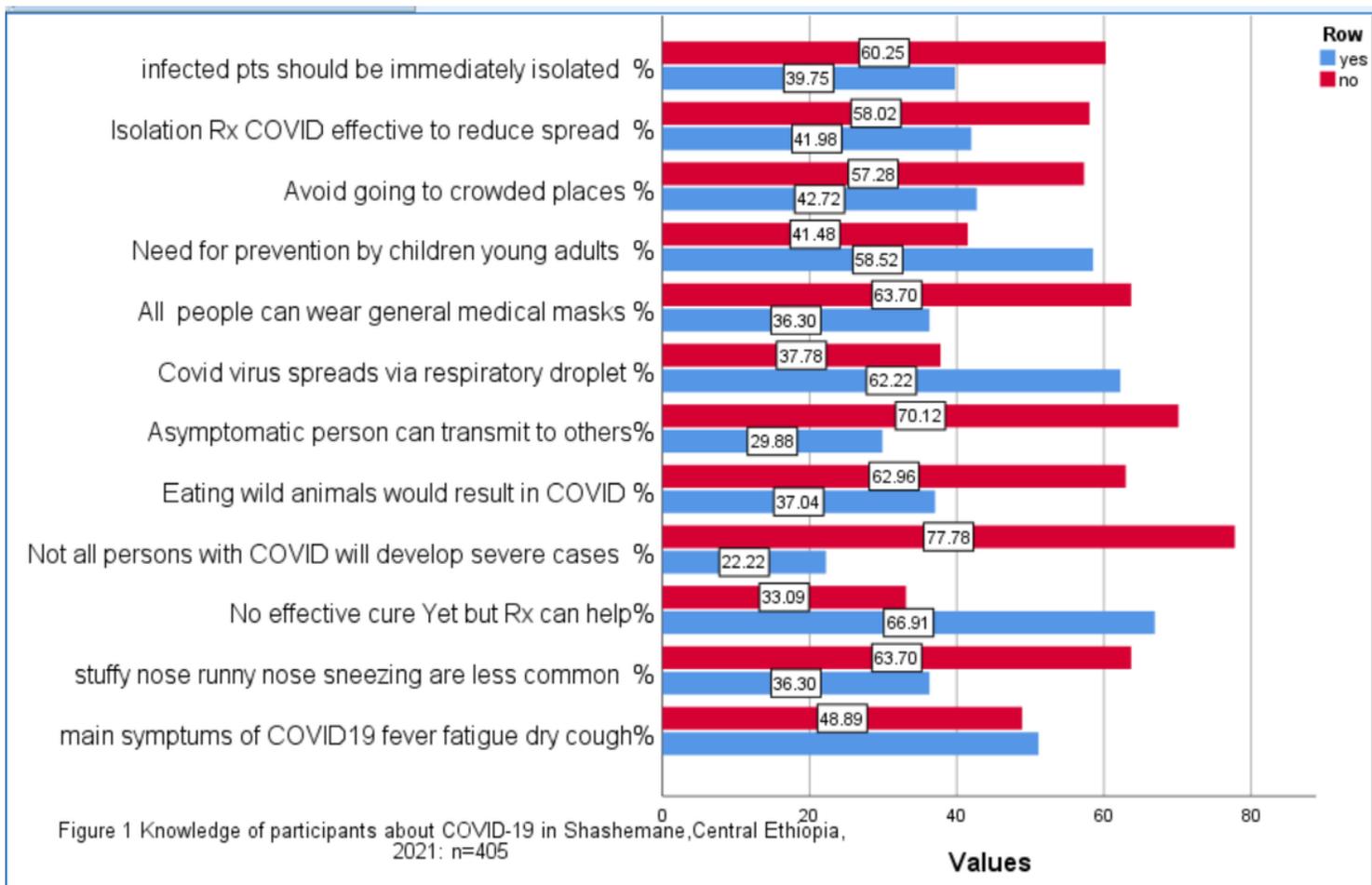


Figure 1

Knowledge of participants about COVID-19 in Shashemane, Central Ethiopia, 2021: n=405

Practice of COVID-19 prevention measures

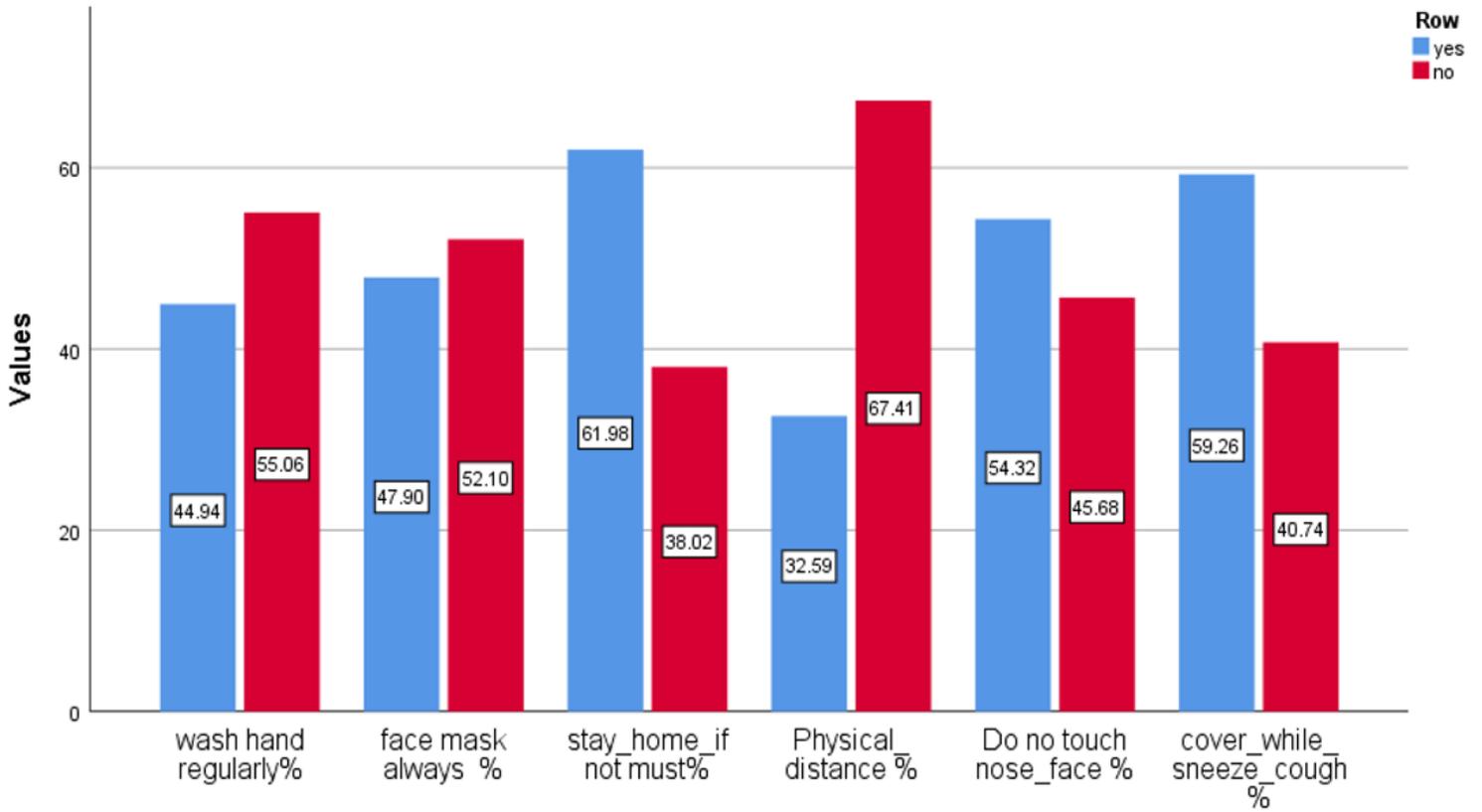


Figure 2 Practice of COVID-19 prevention measures among Residents of Shashemane, Central Ethiopia, 2021

Figure 2

Practice of COVID-19 prevention measures among Residents of Shashemane, Central Ethiopia, 2021