ORIGINAL RESEARCH

Risk Perception and Behavioral Response of Teachers to COVID-19 in Southern Ethiopia, 2021

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Introduction: Coronavirus disease 2019 (COVID-19) is an infectious illness which was first identified in Wuhan China. The mode of transmission of COVID-19 is mainly from person-to-person by respiratory transmission and from contact with contaminated surfaces. Teachers may have a significant higher number of social interactions than other professions, putting them at greater risk of contracting the virus.

Objective: The aim of this study was to assess the risk perception and behavioral response of teachers to COVID-19 in Gamo zone, Southern Ethiopia.

Methods: The study was conducted in Gamo zone from February to march, 2021. An Institution-based-cross sectional study design was employed and multi stage sampling technique was utilized to select 634 study participants. The data were collected using Kobo collect survey tool through interviewer administered questionnaire. The data were analyzed by SPSS version 25. Both bivariable and multivariable logistic regression models were fitted to identify factor associated with risk perception and behavioral response. Odds ratio with 95% confidence interval was computed to determine the level of significance; in multivariable analysis, variables with a P value less than 0.05 with 95% confidence interval were considered as statistically significant.

Results: About 79.1% and 75.1% of the teachers had high risk perception and good protective behavior, respectively. Having children ((AOR=1.84, 95% CI: 1.15–2.94), COVID-19 update (AOR=3.7, 95% CI: 1.66–8.59) and good protective behavior (AOR= 1.98, 95% CI: 1.18–3.34) were associated with high risk perception. On the other hand, educational status (AOR=9.42, 95% CI: 4.94–17.96) and availability of personal protective equipment (AOR=5.85, 95CI:2.27–15.02) were associated with good protective behavior.

Conclusion: Although majority of the teachers had good protective behavior, some protective measures were not frequently adopted. There were few individuals who had low risk perception; this could be a potential cause for the occurrence of school outbreak. Therefore, the stakeholder should provide adequate resource and training on COVID-19 to enhance their risk perception and to promote adoption of protective methods.

Keywords: COVID-19, teachers, school outbreak, Ethiopia

Introduction

Coronavirus disease 2019 (COVID-19) is an infectious illness which was first identified in Wuhan China. It is a new disease and no effective treatment is found.[1] The WHO declared it as pandemic on 11th march 2020.[2] In Ethiopia, the first case was reported on March 13, 2020, and since then the number of cases were gradually increasing and have reached 405,745 including 6911 deaths till December 31, 2021.[3]

The common way of transmission of COVID-19 from person to person is through respiratory transmission and contact with infected surfaces. People with older age and those who have other medical illness are vulnerable to develop serious sign and symptoms.[4] Majority of infected individuals may have no symptoms or mild, however few individuals may develop serious illness which may include acute respiratory distress syndrome or acute myocardial injury.[5,6] The

major concern is that asymptomatic and mildly affected patients might remain undiagnosed and yet most easily keep spreading the virus.[7]

Previously no vaccine or treatment was obtained to prevent the virus.[8] On March 2021 WHO approved COVID-19 vaccine campaign launched in Africa for high risk frontline health professionals.[9] Being vaccinated does not mean that it full protects against the disease; research is still ongoing into how much vaccines protect not only against disease but also against infection and transmission. The other challenge is the new strain of coronal virus is spreading worldwide. The best way to prevent the condition is avoiding exposure.[8]

Schools could be a site for community transmission of infectious disease outbreak. During initial phase of the outbreak, some countries have taken the drastic measure to shut down schools.[10] As teachers have a significant higher number of social interactions than other professions, they are vulnerable for contracting the virus.[11] A previous research report showed that educational workers were infected with COVID-19 and one in four teachers have a higher risk of Covid-19 infection.[10]

During reopening of schools the COVID-19 prevention measures should be adopted for returning staff and students with strict limitations on the number of staff and students. A study conducted in England showed that the reopening of preschools and primarily following the easing of national lock down was associated with total of 198 confirmed COVID-19 cases. The staff to staff transmission was high.[12] A similar study conducted in Israel reported that after the reopening of schools ten days after reopening the first major school outbreak emerged in high schools. Overall, 153 students and 25 staff members were confirmed as COVID-19-positive.[13]

A previous research reported that people may have risk perception to a threat if they believe that they are personally susceptible to develop the condition against which protection is required; perceive the condition as severe; perceive the preventive action as effective to reduce the threat; and believe they are capable to perform the preventive action.[14,15] A survey conducted in Iraqi reported that only 6.9% of academic staff and students perceived their risk of getting infection of COVID-19 highly likely, and 4% and 5.7% of respondents perceived their risk of getting severe illness and risk of death as highly likely, respectively.[16]

Previous research reported that a number of factors were associated with risk perception like age,[17] gender,[18] protective behavior,[19–21] and Comorbidities.[22] Assessing risk factors might be essential for targeting high risk individuals and for planning intervention to control the pandemic.

The Ethiopian government has decided to reopen schools and universities which have been closed for several months. The Ethiopian ministry of education has prepared a prevention guideline for COVID-19 which should be implemented at schools. PPE (personal protective equipment) was also provided for students and teachers.[23]

As the teacher are considered as frontline workers assessing their risk perception and behavioral responses towards to COVID-19 and associated factors is important to prevent the occurrence of school outbreak and indirectly at the community level. To our knowledge, no study was available yet to assess teacher's risk perception and their behavior's and associated factors towards COVID-19 in the study area in particular and in Ethiopia in general.

Materials and Methods
Study Settings, Design, and Population
An Institution-based cross-sectional study design was conducted among teachers working in Gamo zone in Southern Ethiopia from February to March, 2021. In Gamo zone there are 591 primary schools and 79 secondary schools in four towns and fourteen districts (woredas). There are 8296 primary school teachers among this 4993 are male and 3303 are females. There are 2066 secondary school teachers among this 1614 are male and 452 are females. Those school teachers working in primary and secondary schools were included whereas teachers who were absent for several reason at the time of data collection were excluded.

Sample Size Determination and Sampling Procedure

The sample size for this study was calculated using single population proportion formula by considering the following assumptions: P (Prevalence of risk perception =0.5 (since there was no study done on risk perception of COVID-19 among school teachers), α (level of significance) = 5%, The Z value at 95% CI and 5% α = 1.96, Margin of error (d) = 0.05

Hence, $n = \frac{Z(1-\alpha/2)^2 \, p(1-p)}{d^2}$

$n = \frac{(1.96)^2 * 0.5 * 0.5}{(0.05)^2} = 384$

By considering design effect 1.5 and 10% non-response, the required sample size was 634.

To recruit the study participants a multistage sampling technique was utilized. First, we selected thirty percent of woredas from Gamo zone by simple random sampling technique. Then from each selected woredas we took thirty percent of primary and secondary schools through random selection. Finally, the study participants were selected using simple random sampling method (computer generated random numbers) after proportionally allocating the sample size based on the number of teachers in the selected schools.

Study Variables

Dependent Variables

Risk perception and behavioral response.

Independent Variables

Socio demographic, medical history, personal related factors were used as predictors.

Operational Definitions

Risk Perceptions

Assessment of whether the teachers were at risk of contracting and perceived severity to COVID-19. Risk perception regarding COVID-19 was assessed using 7 items which includes perceived severity and susceptibility based on five Likert scales: none (1), minimal (2), moderate (3), high (4), and very high (5). Using the mean score, the risk perception was categorized as high risk perception if scored mean or above, and low risk perception if scored below mean.[19,24] The Cronbach's alpha for risk perception item was 0.639.

Behavioral Response

Assessment of whether the teachers adhered with COVID-19 protective measures to protect themselves and their students from acquiring COVID-19. The behavioral response to COVID-19 was measured using 10 questions. The respondents rated how often they were following the preventive methods on five Likert scales: none (1), rarely (2), sometimes (3), frequently (4), and always (5).[19–24] The behavioral response was categorized as poor behavioral response if scored below mean and good behavioral response if scored mean or above the mean. The Cronbach's alpha for behavioral response items was 0.836.

Self-Efficacy

Individual's confidence in their own ability to engage in protective behaviors.[25]

Data Collection Procedure and Collection Instrument

Data was collected using Kobo collect survey tool through interviewer administered questionnaire which was adopted from WHO and from previously conducted related literatures. The data collection tool was pre-tested outside the selected study area.

The questionnaire contained: socio-demographic information, medical history, training related with COVID-19, personal related factors, risk perception and behavioral response assessing questions. The questionnaire was translated in to Amharic and back to English to ensure consistency in meaning. Eight data collectors and four supervisors were recruited for data collection and supervision respectively.

Data Processing and Analysis

The collected data was transferred from kobo tool box to Microsoft Excel 2010 and then completeness of data and cleaning were done to check accuracy and consistency, and any error identified was corrected. Then the data was exported to SPSS version 25 for further clean up and analysis. The association between the outcome and the predictors was assessed using binary logistic regression. A crude odds ratio was computed to determine the strength of association of selected explanatory variables with the dependent variable in the initial bivariable logistic regression analysis. To control for potential confounders and identify independent factors of the outcome variables, variables which showed an association at a p-value ≤ 0.25 in the bi-variable logistic regression model were selected as a potential candidate to fit the final multivariable logistic regression analysis model. Model fitness was checked by Hosmer and Lemeshow goodness of fitness test (P-value of ≥0.05). The association between outcome variables and the explanatory variables was reported by using odds ratio with 95% CI and variables having p-value less than or equal to 0.05 in the multivariable logistic regression model was considered as statistically significant.

Data Quality Assurance

To maintain the quality of data, data collectors and supervisors were trained for three days about the purpose of the study, skills of interview, data collection tools and ethical procedures. Pretest was conducted on 5% of the study participants out of the study area with similar population in order to assess the validity of the instrument. The supervisors were made on-site supervision during the data collection period and review all filled questionnaires so as to identify incomplete and incoherent responses. Data was clean by running frequencies of all the variables to check for incorrectly coded data.

Result

Socio Demographic Characteristics of the Participants

A total of 634 respondents participated in the study, with a response rate of 100%, including 382 (60.3%) men and 252 (39.7%) women. More than half (321, 50.6%) of the participants were 35 years of age and above and mean age of the participants was 37.24 (SD=8.68). Majority of the respondents were first degree in educational status (406, 64%), orthodox religion followers (411, 64.8%), married (483, 76.2%) and Gamo in ethnicity (507, 80%). Of the respondents, only 58 (9.1%) had chronic comorbidity (Table 1).

Personal Related Factors

Of the respondents, 90 (14.2%) had history of contact with confirmed or suspected cases of COVID-19. Majority of respondents (610, 96.2%) mentioned that there is available PPE. About 262 (41.3%) of the teachers were not shown willingness to take COVID-19 vaccine if offered (Table 2).

Risk Perception Towards COVID-19

The overall risk perception mean score was found to be 21.79+2.42. The highest mean score was observed for perceived risk of death (3.07+1.038) and the lowest was for worry about family members and friends (2.17+0.928). About, 192 (30.3%) of the participants had minimal rate of perception on getting infected by COVID-19 (Figure 1). Nearly fourth fifth (502, 79.2%) of the participants had high risk perception.

The mean score of COVID-19 vulnerability and severity was compared to other common infectious disease in the area. Accordingly, the mean score of perceived severity of COVID-19 (3.46+ 0.667) was higher than human immuno-deficiency virus (2.87+0.8), common cold (2.23+0.72), malaria (2.46+ 1.01) and tuberculosis (2.52+1.03) (Table 3).

Behavioral Response to COVID-19

The mean of total sum cumulative score of protective behavior was 35.07 (SD= 6.55). The overall mean score of protective behavior was 2.92+ 0.54. The lowest mean scores was how often avoid public transportation (2.5+0.795) followed by how often mix students freely inside or outside the class room (2.59+0.89). More than three fourth (476, 75.1%) of respondents had good protective behavior. To assess the self-efficacy, the participants were asked a 5-point likert scale question "how do you rate perceived ability to avoid infection with COVID-19? Its mean score was found to

Table 1 Socio-Demographic and Clinical Characteristics of Study Participants (n=634) Gamo Zone, Southern Ethiopia, 2021

Variable	Categories	Frequency	Percent
Age category	18–25	23	3.6
	26–35	290	45.7
	>35	321	50.6
Gender	Male	382	60.3
	Female	252	39.7
Marital status	Married	483	76.2
	Divorced	21	3.3
	Single	119	18.8
	Widowed	11	1.7
Educational status	First degree	406	64.0
	Second degree	24	3.8
	Diploma	204	32.2
Religion	Orthdox	411	64.8
	Protestant	196	30.9
	Muslim	27	4.3
Ethnicity	Gamo	507	80.0
	Wolayta	44	6.9
	Amhara	37	5.8
	Other(specify)*	44	6.9
Medical history	DM	23	3.6
	Asthma	14	2.2
	Hypertension	21	3.3
	None	576	90.9

Note: Other(specify)*:Gofa (26,4.1%), Gurage (7,1.1%), Silte (9,1.4%).
Abbreviation: DM, diabetes mellitus.

be 2.82+0.51.Of the respondents, 146 (23%) of them had minima rate of perception for the ability to avoid infection with COVID-19. Less than half (299, 47.2%) of the participant utilized face mask frequently (Table 4).

Factors Associated with Risk Perception Towards COVID-19

Variables significantly associated in risk perception (p<0.25) in the univariate analysis were entered in back ward multiple logistic regression. The multivariate logistic regression analysis showed that gender, update information on COVID-19, having children and protective behavioral response were found associated with high risk perception.

The odds of high risk perception among teachers who had children were nearly two times more likely to have high risk perception than who did not have children (AOR=1.81,95% CI:1.14–2.88). Likewise, those teachers who did have a COVID-19 update were four times likely to have high risk perception than who did not have COVID-19 update (AOR=4.35,95% CI:1.95–9.69). Similarly, a participants who had good protective behavior were nearly two time likely to have high risk perception than poor protective behavior (AOR= 1.94, 95% CI: 1.16–3.23) (Table 5).

Table 2 Personal Related Characteristics of Respondents Gamo Zone, Southern Ethiopia, 2021

Variables	Frequency	Percentage
How community members responding to prevention practices?		
Not at all	27	4.3
Somewhat	294	46.4
Moderately	313	49.4
Contact with COVID-19 confirmed or suspected individuals		
Yes	90	14.2
No	544	85.8
Does PPE is available?		
Yes	610	96.2
No	24	3.8
Taking COVID-19 related training		
Yes	11	1.7
No	623	98.3
Government support for preventing COVID-19		
Yes	618	97.5
No	16	2.5
Smoking cigarette		
Yes	53	8.4
No	581	91.6
Performing physical exercise		
Yes	382	60.3
No	252	39.7
Willingness to take COVID-19 vaccine		
Yes	372	58.7
No	262	41.3
COVID-19 information update		
Yes	607	95.7
No	27	4.3

Abbreviation: PPE, personal protective equipment.

The odds of good protective behavior among teachers who had first degree educational status were nine times more likely than diploma holders (AOR=9.42,95% CI:4.94–17.958). Likewise, those who reported there was available PPE was six times more likely to have good protective behavior than there was no PPE (AOR=5.85, 95CI:2.27–15.02) (Table 6).
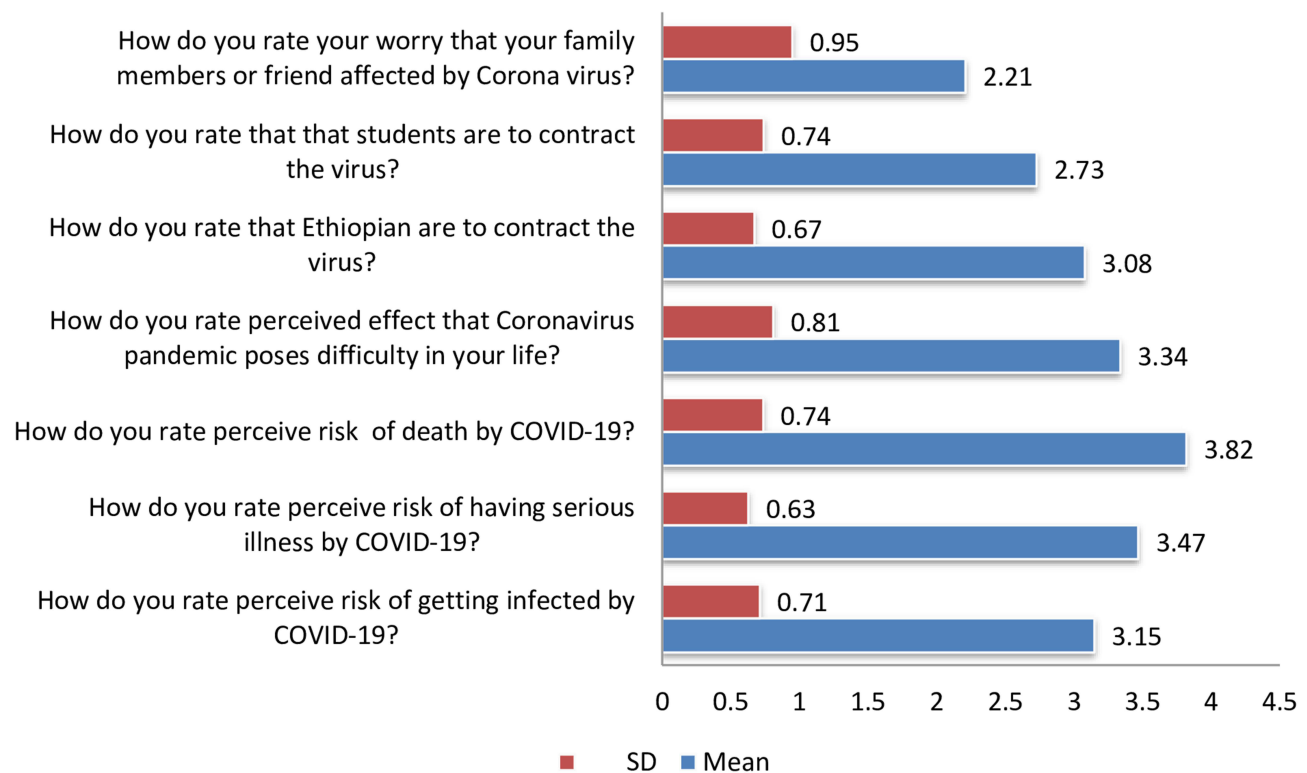
Figure 1 Mean score of risk perception to COVID-19 among teachers working in Gamo zone, Southern Ethiopia, 2021.

Discussion

Good response and preventive strategies at individual and governmental level is crucial for controlling infectious disease outbreak, this is based on extent of understanding of the disease and behavioral response of the individuals.[26,27] This was the first study in Ethiopia to assess risk perception and behavioral response and associated factors among teachers to COVID-19.

This study reported that 79.1% of the teachers had high risk perception to COVID-19. It is comparable with a study done in Ghana.[28] It is lower than a study conducted in west Ethiopia among health professionals. It is higher than a study conducted on similar infectious disease outbreak.[29,30] This might be due to difference in population, methodology and time of data collection which means at initial phase of a pandemic the people might be panic as they are new for the event. Taking into consideration the high infectivity of COVID-19 and occult nature of the disease,[31] a small number of

Table 3 Mean Score of Perceived Severity and Vulnerability of Teachers Working in Gamo Zone, Southern Ethiopia, 2021

Disease	Severity		Vulnerability	
	Mean	SD	Mean	SD
COVID-19	3.46	0.667	3.11	0.58
HIV AIDS	2.87	0.812	2.23	0.734
Malaria	2.46	1.01	2.81	1.015
Tuberculosis	2.52	1.038	2.45	0.95
Common cold	2.23	0.72	2.82	1.016

Abbreviation: SD, standard deviation.

Table 4 Protective Behavioral Response of COVID-19 Among Teachers Working in Gamo Zone, Southern Ethiopia, 2021

Behavioral Response	None	Rarely	Sometimes	Frequently	Always
	N(%)	N(%)	N(%)	N(%)	N(%)
How often do you avoid yourself from people sneezing or coughing?	136(21.5%)	90(14.2)	251(39.6%)	151(23.8)	6(0.9)
How often do you avoid social gathering?	140(22.1)	107(16.9)	243(38.3)	144(22.7)	
How often do you avoid touching face, mouth, nose and eyes?	137(21.6)	114(18)	242(38.2)	139(21.9)	2(0.3)
How often do you frequently wash your hands?	12(1.9)	73(11.5)	222(35)	223(35.2)	104(16.4)
How often do you avoid public places transportation?	65(10.3)	242(38.2)	279(44)	44(6.9)	4(0.6)
How often do you use alcohol based disinfectant?	38(6)	173(27.3)	295(46.5)	122(19.2)	6(0.9)
How often do you wear a mask?	26(4.1)	53(8.4)	220(34.7)	299(47.2)	36(5.7)
How often do you regularly clean and disinfect frequently touched areas?	94(14.8)	156(24.6)	305(48.1)	78(12.3)	1(0.2)
How often do you share objects with the students freely without using sanitizer?	90(14.2)	156(24.6)	310(48.9)	76(12)	2(0.3)
How often do you mix the students freely inside or outside the class room?	103(16.2)	125(19.7)	334(52.7)	71(11.2)	1(0.2)
How often do you apply recommended number of students to attend in your class room?	7(1.1)	23(3.6)	250(39.4)	328(51.7)	26(4.1)
How often do you follow your students to properly wear facemask?	16(2.5)	34(5.4)	211(33.3)	308(48.6)	65(10.3)

low risk perception may lead to recurrent school outbreak. In this study although most of the teachers had high risk perception, 248 (39.1%) of them had minimal rate of that the students may contract the corona virus and 198 (31.2%) of the participants said that worry about the family members to contract the corona virus is none. The reason for this could be the teachers might be worried about themselves rather than their families and students. Underestimating this risk perception may lead to risky behavior. Concerning self-efficacy, the mean score was found to be 2.82+0.51. Of the respondents, 146 (23%) of them had minima rate of perception to control infection with COVID-19. Only 5.7% had high perception to control COVID-19. It is comparable with a study reported by Shimelis Girma et.al.[24]

This study depicted that females had more high risk perception than males. In contrast to our study Tanvir A.et al.[18] reported that males were more likely to have high risk perception than females. This difference could be gender unequal participation.

Likewise, a teacher who had good protective behavior was nearly two times likely to have high risk perception than having poor protective behavior.This finding is supported by previous studies.[19–21] This indicates that adequate risk communication on the severity and susceptibility to COVID-19 may promote practicing protective methods. Risk perception has encouraged teachers to take stronger safety precautions. Similarly, the odds of high risk perception among teachers who had children were nearly two times than its counterpart. This might be as the teachers are in contact with dozen of students, they could be vulnerable for contracting the disease. As the disease is highly infectious, they may fear of infecting their children when they return home. Those who had updated information on COVID-19 were more likely to have high risk perception than those who did not have update information. This can be explained by getting updated information related with COVID-19, for instance, number of new infected cases, number of death and the occurrence of new strain of corona virus may help teachers to be more cautious and enhances adopting COVID-19 protective measures.

On the other hand, our study reported that education status and availability of PPE were found associated with good behavioral response to COVID-19. The first degree holder teachers were more likely to implement good protective

Table 5 Factors Associated with High Risk Perception Towards COVID-19 Among Teachers Working in Gamo Zone, Southern Ethiopia, 2021

Variables	Risk Perception		COR (95% CI)	AOR (95% CI)	P-value
	High Risk Perception	Low Risk Perception			
Sex					
Male	315(62.7)	67(50.8%)	1	1	0.013*
Female	187(37.3)	65(49.2%)	1.63(1.11–2.40)	1.65(1.11–2.45)	
Educational status					
Second degree	16(3.2%)	8(6.1%)	1.81(0.73–4.52)	2.27(0.87–5.93)	0.094
First degree	326(64.9%)	80(60.6%)	0.89(0.59–1.35)	1.02(0.64–1.63)	0.903
Diploma	160(31.9%)	44(33.3%)	1	1	
Community response to COVID-19					
Yes	484(96.4%)	123(93.2%)	1	1	0.105
No	18(3.6%)	9(6.8%)	1.96(0.86–4.48)	2.05(0.86–4.92)	
COVID-19 update information					
Yes	488(97.2%)	119(90.2%)	3.8(1.74–8.3)	4.35(1.95–9.69)	0.002*
No	14(2.8%)	13(9.8)	1	1	
Having children					
Yes	414(82.5%)	97(73.5%)	1.69(1.08–2.66)	1.81(1.14–2.88)	0.01*
No	88(17.5%)	35(26.5%)	1	1	
Contact history of COVID-19					
Yes	76(15.1%)	14(1.6%)	0.67(0.363–1.218)	0.606(0.325–1.132)	0.116
No	426(84.9%)	118(89.4%)	1		
Protective behavior					
Good protective behavior	367(73.1%)	109(82.6%)	1.74(1.067–2.84)	1.94(1.16–3.23)	0.01*
Poor protective behavior	135(26.9%)	23(17.4%)	1	1	

Note: *Significant at p-value <0.05.

measures than diploma holders. The reason for this could be people who are in highest educational level are more likely to read articles, newspaper and follow social media for getting information about COVID-19. Understanding the prevention methods of COVID-19 may enhance adoption of prevention practice of COVID-19. However, due to cross sectional nature of the study, we cannot confirm the temporal relationship between educational status and prevention practice. The odds of good protective behavior among teachers who said there is available PPE were more likely to have good protective behavior than no available PPE. The preventive measure for COVID 19 infections require personal protective equipment (PPE) for protection from infections.[32] If there is protective equipment, peoples are more likely adopting protective measures. Moreover, this study showed that majority (96%) of teachers mentioned that there is available PPE at schools. The reason for this could be at time of data collection the schools were well prepared themselves, like provision of face masks and sanitizer, for reopening of schools which were closed for long time.

Table 6 Multivariate Logistic Regression for Factors Associated with Behavioral Response to COVID-19 Among Teachers Working in Gamo Zone, Southern Ethiopia, 2021

Variables	Protective Behavior		COR (95% CI)	AOR (95% CI)	P-value
	Good Protective Behavior	Poor Protective Behavior			
Sex					
Male	280(58.8%)	102(64.6%)	1	1	0.31
Female	196(41.2%)	56(35.4%)	1.27(0.87–1.85)	0.81(0.53–1.21)	
Second degree	22(4.6%)	2(1.3%)	1.45(0.296–7.098)	1.465(0.298–7.211)	0.638
First degree	261(54.8%(	145(91.8%)	1.58(0.339–7.45)	9.42(4.94–17.958)	0.000*
Diploma	193(40.5%)	11(7%)		1	
Availability of PPE					
Yes	468(98.3%)	142(89.9%)	6.59(2.76–15.72)	5.85(2.27–15.025)	0.000*
No	8(1.7%)	16(10.1%)		1	
Having children					
Yes	391(82.1%)	120(75.9%)	1.45(0.944–2.25)	(0.591–1.493)	0.939
No	85(17.9%)	38(24.1%)	1	1	
COVID-19 update					
Yes	459(96.4%)	148(93.7%)	1.82(0.81–4.07)	1.84(0.67–5.106)	0.237
No	17(3.6%)	10(6.3%)	1	1	
History of Medical comorbidity					
Yes	52(10.9%)	6(3.8%)	0.32(0.136–0.765)	0.488(0.18–1.32)	0.158
No	424(89.1%)	152(96.2%)	1	1	

Note: *Significant at p-value <0.05.
Abbreviation: PPE: personal protective equipment.

Although more than three fourth of the teachers had good protective practice, only little number of participants were adopting certain protective measures, for example only 0.9%, 5.7%, 16.4% of respondents were using sanitizer, wearing mask and washing hands always respectively. These results are lower than a study conducted in Ethiopia among general population and in Iran.[33,34] It is comparable with a study conducted among waiters in south west Ethiopia.[19] This variation could be different in population, availability of personal protective equipment, extent of spreading of the infection in the area and time when the study was conducted at the initial phase of the exposure of the infectious disease the person may have high risk perception which will lead to be more curious for adopting protective measures.

This study showed that implementation of Ethiopian government COVID-19 prevention guideline prepared for school is low. For instance, only 4% of the teachers were always adopting recommended number of students to attend the class and less than half were often follow their students wearing face mask. This is in agreement with a study conducted in Taiwan where 16% of high school teachers separate their students.[35] The reason for this could be the teachers might not have taken awareness and did not take training on COVID-19 prevention guideline before the reopening of schools. The other possible reason the shortage of class room which may hinder implementing the recommended number of students to attend the class.

The other important finding of this study was the mean perceived severity and vulnerability to COVID-19 was higher than other common infectious disease. Similarly, a study conducted among academic staff and student in Iraqi showed highest perceived threat level to COVID-19 in comparison to other medical illness.[16] Moreover, this finding is also supported

by a study conducted in southwest Ethiopia.[19] A higher level of severity perception of SARS was also reported in Europe.[36] This implies that the respondents might have getting adequate information on severity and infectivity of COVID-19, which made the teachers consider the virus more threatening than any other disease. In addition scientific uncertainty in scientific understanding of the virus may also contribute for high perceived severity and vulnerability to COVID-19.

Even though the COVID-19 vaccine was not introduced in Ethiopia at the time of data collection the respondents were asked their willingness to take COVID-19 vaccine if offered. Accordingly, about 41.3% of them were not interested to take a vaccine. This indicates that there is a need to create awareness on vague information about the vaccine before starting vaccine provision for school teachers. In Ethiopia through the COVAX initiative the COVID-19 vaccine provision was launched on 13 marches 2021 for high risk frontline health professionals at Eka Kotebe COVID-19 Hospital. Ethiopia aims to vaccinate 20% of the population by the end of 2021.[37]

Strength and Limitation of the Study

As strength to the best of our knowledge no data have been published in Ethiopia showing risk perception and behavioral response among teachers. The developed questionnaire was close ended and pilot tested to reduce information bias.

However, the study was not without limitations. Firstly as it is a cross sectional study design causality between dependent and independent variables could not be determined. A further cohort based study design should be considered to assess and monitor the change of behavioral practice and risk perception of the participants.

Secondly, as the study was conducted after the implementation of government school COVID-19 prevention protocol, behavioral patterns might be changed if the authorities have regulation and policy changes.

Conclusion and Recommendation

Nearly four fifth of the teachers had high risk perception. A few number of teachers had low risk perception which should be given attention and should have a plan to enhance their risk perception and promote adopting of protective measurements.

Gender, update information on COVID-19, having children and protective behavioral response were associated with high risk perception. On the other hand, Educational status and availability of PPE were associated with Good protective behavior.

Although majority of the participants had good protective behavior, certain protective measures were not frequently implemented like wearing facemask and hand washing. The government should continue providing clear and accurate information and sufficient resources to encourage high risk perception and promote adopting of protective measures.

Data Sharing Statement

The datasets for the current study are not publicly available but are available upon reasonable request by emailing the corresponding author.

Ethical Approval

Ethical clearance was obtained from Arba Minch University Institutional research Ethics Review Board, College of Medicine and Health Sciences with reference number (IRB/1012/21). A formal letter of cooperation was obtained from each concerned body. Oral consent was obtained from each study respondents because no adverse reactions would be expected as the participants were only interviewed and no invasive procedures were carried out. The verbal consent was approved by the Arba Minch University Institutional research Ethics Review Board. The purpose of the study was explained for each study respondents. Participants were also informed that they could withdraw from the study at any time if they were not comfortable about the questions. To ensure confidentiality, their names, and other personal identifiers were not registered in the survey tool. Besides, this study was conducted in accordance with the Declaration of Helsinki, and all ethical and professional considerations were followed throughout the study to keep participants' data strictly confidential. The COVID-19 prevention protocol was applied during data collection.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or 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.

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Disclosure

The authors declare that they have no competing interests in this work.

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