Covid-19 Prevention Practices and Associated Factors Among Workers in Yirgalem Agro-Industry Park, Sidama Regional State, Ethiopia, 2020: Institutional Based Cross-Sectional Study

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ABSTRACT

Background: COVID-19 outbreak resulted in millions of cases and deaths with an incredible pace of spread. It has been a global public health crisis since December 2019. Though the work behaviors of some organizations can facilitate more ways for the mode of transmission, the potential work areas for the risk of infection are not identified yet. Designing intervention strategies based on the risky assessment findings of a specific population or organization is better. The problem is more significant in developing countries. Methods: Cross-sectional study design was conducted from June 15th to August 15th, 2020. The study was conducted among all active workers of Yirgalem Agro-Industrial park. Data were collected and entered into EpiData 3.1 and exported to SPSS22 for analysis. Factors associated with the practice of prevention were then analyzed. Results: - Among the respondents, 91.8%, 75.1%, and 48.9% had good knowledge, positive attitudes, and good practice toward COVID-19 prevention strategies respectively. Multivariate regression revealed that age, spiritual or sin, training, knowledge, attitude, opposition to wearing, ordinary residents, and hoping leaders can win against COVID-19 were predicted practices of COVID-19 prevention strategies. Conclusion: The practice of COVID-19 prevention strategies was so poor and need adequate attention. Age, spiritual/sin as a cause, prior training, knowledge, attitude, Opposing mask-wearing, and belief in whether to defeat COVID-19 or not were identified as the predictors. It is so important to revamp the current practices and assure the implementation of the standard as expected.

INTRODUCTION

Coronaviruses are viruses of a large family that is known for resulting in illness ranging from the common cold to more severe disease like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) [1,2]. The most aggressive human coronavirus is the one that causes fatal lung disease, Severe Acute Respiratory Syndrome (SARS), and it is called SARS-CoV (Lia, 2015). World Health Organization called the current coronavirus "2019 nCoV" i.e. 2019 novel coronavirus or COVID-19. Globally, it resulted in more than three million attacks and closer to a million deaths within a short period with incredible spread. Its recent outbreak occurred in Wuhan, China for the first time [3].

According to the 2020 World Health Organization data, it is a global pandemic disease resulting in enormous public health impact and tremendous economic and social crisis which is generating stress throughout the population. Everybody in the population is susceptible to this disease. However, some factors increase susceptibility. Since there is no identified treatment yet, delaying transmission or reducing the risk of the outbreak is paramount important in decreasing its diversified impacts on different sectors. Various modes of prevention like wearing masks, hand hygiene practices, social (physical) distancing, case detection, contact tracing, and quarantines have been recommended to reduce its risk of transmission [4].

During the first week of the COVID-19 pandemic attack, the prevention methods were misperceived in the USA. There was also, unawareness, not engaging in social distancing, and negligence in practicing protective behaviors [5]. This may be due to unawareness as finding from china evidenced peoples' knowledge, attitude, and practice towards COVID-19 positively affects adherence to control measures. In this region, most Chinese of high economic status especially women were knowledgeable about COVID-19, hold an optimistic attitude and have appropriate practices for its prevention [6]. Since its emerging time, the world has been striving to find a solution to tackling the infection. Nevertheless, all trials and efforts brought no solution for this pandemic infection to date. Though developed countries are found to be the unique victim of the problem, developing countries including Ethiopia are significantly vulnerable to the disease. The spread of the infection is escalating vigorously and COVID-19-related deaths have been reported in 52 African countries [7].

The potential work areas for the spread of the infection are not clearly stated. On top of this, many things including the mode of transmission, the reservoir, and sources of infection remain unclear about Covid-19. Due to the gap in data, risk assessment of the infection is still vague [8]. Thus, this study aims to assess the risky behaviors of COVID-19 infection that will serve as input for the reduction of the infection in the organization, particularly in manufacturing companies.

The COVID-19 infection does have various modes of transmission. The work behaviors of some organizations can facilitate more ways for this mode of transmission. Thus, any prevention and intervention strategies shall base on these correspondent risky behaviors to bear effective results.

In Yirgalem Agro-Industry Park, different categories of people in terms of educational status, socio-economic differences, and cultural practices are involved in the job. The foreigners who might have traveled to their home

country where there is a high epidemiologic distribution of the disease are also part of the workers in this industrial park. Besides, it is believed that behaviours (practices) like overcrowding in a certain place, transportation of many passengers in a single bus, daily traveling of workers with a possible risk of contact, and greeting practices like hugging each other and hand-shaking are common among the workers. Again, nothing is known concerning the knowledge, attitude, and practice towards the infection prevention of COVID-19 in the area.

Thus, this study will assess the risky behaviors at the workplace for COVID-19 infection in this Hawassa industrial park. The finding of this study will also be inferred for a similar organization like other factories and an interventional project will be designed with Hawassa University to tackle the spread of the infection. Other government and non-government organizations that are concerned with the subject matter can use the result of this study to design their intervention strategies. Moreover, as there is a significant gap concerning this disease, the study finding will serve as baseline information for the country as well as other parts of the world and other researchers interested in the related issues can use it as scientific literature.

METHOD

Study Area, Population and Period

An Institutional based Cross-sectional study was conducted in Yirgalem Agro-Industrial park, southern Ethiopia to assess risky behavior for COVID-19 at the workplace. The Industry Park is found in Agosto kebele, Dale woreda, Sidama Regional State which is 320 Kilometers far to the south of the capital of Ethiopia. It does have many sheds from which few of them are now engaged in active work. The functioning sheds are involved in producing juices and other manufacturing. The study included all active workers of Yirgalem Agro-Industrial Park from June 15th to August 15th, 2020, and excluded active workers who were on leave during the study period.

Data Collection Procedure and Period

The data collection tool was developed after reviewing various kinds of literature. Finally, it was adapted from WHO Protocol for the assessment of potential risk factors for the 2019 novel coronavirus and translated into the local language (Amharic) for better understanding. After adaption, a pretest was done on 5% of the sample size to test for clarity and consistency. Data collectors were trained for two days about the objective of the study, how to approach participants, how to handle the information and how to keep confidentiality. Those data collectors used all personal protective equipment and kept recommended COVID-19 protocols in interviewing with study participants. In this study, workplace behavior was measured as "risky" if industry park workers did not adhere to all covid-19 prevention protocols.

Questionnaires were checked on daily bases for completeness and clarity through close supervision by the principal investigator. Data collectors reached the study participants by getting permission from the concerned bodies and then getting consent from each study respondent.

Risk Factors for Covid-19

The dependent variable for this study was Risky behavior for Covid-19 and the overall assessment was based on the primary data collected from the eligible participants involved in the study. The independent variables were Sociodemographic characteristics (Age, sex, place of residence, Religion, educational status, marital status),

Knowledge related (Droplet, smoking, isolation, mask utilization, crowd ness, Distancing, prickling nose/eyes, touching the mouth, workers health status), Attitude related, practice-related and institution related variables/factors were considered. Those Potential risk factors for risky behavior were selected based on reviewing previous kinds of literature. Finally, each variable was dichotomized into and coded by giving 0 to the group hypothesized as having a lower risk and 1 to the group hypothesized as having a higher risk.

Management of Data and Quality Control

Data quality was assured by using a data collection tool that was adapted from the World health organization's COVID-19 protocol. A pretest was done on 5% (12 Industrial workers) one week before the actual study to check the consistency of the data collection tool in Hawassa Industrial park. The modification was made after the pretest accordingly. The data were collected by trained personnel. Intensive supervision was done by the supervisor and principal investigator during the whole process of data collection. Daily evaluation of the data for completeness was undertaken accordingly. Then, all the collected data were checked for completeness and consistency during the data management, storage, and analysis.

Statistical Analysis

Collected data were cleaned, coded, and entered into Epi data version 3.1 and exported to SPSS version 22 software packages for analysis. Any errors were identified and corrected after the review of the original data using the code numbers. A descriptive exploratory analysis was run to assess missing values and the presence of outliers. Mean, median, standard deviation, proportions, and rate were calculated for descriptive data and frequency distribution was used for categorical data. Factors associated with the practice of COVID-19 prevention were primarily analyzed using binary logistic regression and then variables with p-value <0.25 were analyzed in multivariable logistic regression analysis with a 95% confidence interval and finally p-value <0.05 was considered statistically significant. The odds ratios together with their corresponding 95% confidence intervals were interpreted accordingly.

Operational Definitions

Good/Adequate knowledge: Respondents who scored greater than or equal to the mean score of the knowledge questions. Poor/Inadequate Knowledge: Respondents who scored less than the mean score of the knowledge questions. Favorable attitude: Respondents who scored greater than or equal to the means core of the attitude questions. Unfavorable attitude: Respondents who scored less than the means core of the attitude questions. Good Practice: Respondents who scored greater than or equal to the mean score of the attitude questions. Poor Practice: Respondents who scored less than the means core of the attitude questions.

Dissemination of the Result

The result of the study will be submitted and presented to Yirgalem Agro-Industrial Park for immediate interventional activities. Hawassa University will also be informed for further research and action. The findings of the study will also be presented in locally or internationally held-seminars, workshops, conferences, and meetings and will be made available in internationally recognized journals.

RESULT

Sociodemographic Characteristics of the Study Participants

All 233 study populations participated in the study with a response rate of 100%. The majorities 143 (61.4%) were males and more than half (56.2%) of those study participants were unmarried. The minimum and maximum ages of the study participants were 18 and 80 with a mean and standard deviation of 28.25 ± 7.4 years. More than three fourth (81.5%) of the study participants live in Yirgalem town and the majority (55.8%) were followers of the protestant Religion. Around one-third (38.2%) of the study, participants had the educational status of attending college and above while few (4.7%) of them had no formal education (Table 1).

Table 1 Socio-demographic characteristics of the respondents by sex, age, marital status, religion, and residents, Yirgalem, Sidama Region, Ethiopia 2020 (n=233)

Characteristics		Frequency	%
Sex	Male	143	61.40%
	Female	90	38.60%
Age	15-24	63	27%
	25-34	116	49.80%
	35-44	34	14.60%
	≥ 45	20	8.60%
Marital status	Unmarried	131	56.20%
	Married	102	43.80%
Religion	Protestant	130	55.80%
	Orthodox	51	21.90%
	Muslim	17	7.30%
	Catholic	14	6%
	Others@	21	9%
Residence	Yirgalem	191	82%
	Hawassa	23	9.90%
	Other@@	19	8.20%
Education	No formal education*	11	4.70%
	Primary education**	61	26.20%
	Secondary education***	72	30.90%
	College & above****	89	38.20%
Mean age of respondents by year: mean $\pm$ SD=28.25 $\pm$ 7.4			
Others@:- apostle, Wakefata, pagan			
*not educated, **Grade 1-8, ***Grade 9-10, ****professional specific education			

Knowledge of COVID-19 Prevention

Almost all 214 (91.8%) study participants had good knowledge and about three forth 169 (72.5%) of the study participants did not know that children need to take measures to prevent COVID-19. More than 6% of the study participants did not consider individual crowd ness as one way of COVID-19 transmission (Table 2).

Table 2 Knowledge of the participants towards COVID-19 Prevention, Yirgalem, Sidama Region, Ethiopia, 2020 (n=233)

Characteristics		Frequency	Percentage

Spread via droplet	Yes	206	88.4%
	No	27	11.6%
Smokers are at risk	Yes	210	90.1%
	No	23	9.9%
Isolation is an effective way	Yes	211	90.6%
	No	22	9.4%
Ordinary residents should wear the mask	Yes	220	94.4%
	No	13	5.6%
Children do not need to take measure	Yes	64	27.5%
	No	169	72.5%
Individuals need to void crowded place	Yes	218	93.6%
	No	15	6.4%
A contracted person needs to be isolated	Yes	222	95.3%
	No	11	4.7%
Washing hands is advised	Yes	222	95.3%
	No	11	4.7%
Distancing	Yes	227	97.4%
	No	6	2.6%
Avoid prickling eyes, nose, and touching the mouth	Yes	218	93.6%
	No	15	6.4%
All develop severe disease	Yes	161	69.1%
	No	72	30.9%
Good knowledge: - 214 (91.8%), Poor knowledge: - 19 (8.2%), Range (11-22)			
Mean ± SD=20.23 ± 1.46			

Attitude toward COVID-19 Prevention

The majority (75.1%) of the study participants had a positive attitude about COVID-19 prevention strategies and about 24.5% of the study participants did not think that COVID-19 will be controlled. More than half (54.1%) of the respondents said that the cause of COVID-19 is Sin while about half (42.9%) of the study respondents said that traditional medicine can cure this disease. More than one-third (52.8%) of the study participants said that the world health Organization can win the challenges of attitude about COVID-19 prevention strategies (Table 3).

Table 3 Attitude of the participants towards COVID-19 Prevention, Yirgalem, Sidama Region, Ethiopia, 2020 (n=233)

Characteristics		**frequency**	**Percent**
Do you think COVID-19 will be controlled	Disagree	57	24.5%
	Neutral	29	12.4%
	Agree	147	63.1%
WHO@ can win	Disagree	82	35.2%
	Neutral	28	12%
	Agree	123	52.8%
Cause of COVID-19 is Sin	Disagree	77	33%

	Neutral	30	12.9%
	Agree	126	54.1%
	Disagree	58	24.9%
You oppose wearing a mask	Neutral	26	11.2%
	Agree	149	63.9%
	Disagree	88	37.8%
Affected by COVID-19 information	Neutral	27	11.6%
	Agree	118	50.6%
	Disagree	90	38.6%
Traditional medicine cure COVID-19	Neutral	43	18.5%
	Agree	100	42.9%
WHO@ =World Health Organization			
Positive Attitude: 175 (75.1%), Negative attitude 58 (24.9%), Range = (1-24)			
Mean ± SD=20.89 ± 5.45			

Overall Practices

Among the total study participants, about half (48.9%) were not practicing COVID-19 prevention strategies. For instance, 24.3% of the study participants were not wearing personal protective equipment while 39.9% of them occasionally wear their protective equipment. Only 29.6% and 31.3% of the study participants always use alcohol/water and soap after touching a man and a product respectively as per the recommendations. One-third (33%) of the study respondents always practice recommended hand hygiene and 25.5% of the study respondents use alcohol/water and soap before touching a man as per the recommendation (Table 4).

Table 4 Practice of the participants towards COVID-19 Prevention, Yirgalem, Sidama Region, Ethiopia, 2020 (n=233)

Characteristics	Rarely	Occasionally	Most of the time	Always as recommended
Practice recommended hand-hygiene	10 (4.3%)	25(10.7%)	121(51.9%)	77(33%)
Use alcohol/water and soap before touching the man	19 (8.2%)	65(27.9%)	90(38.6%)	59(25.3%)
Use alcohol/water and soap after touching the man	17(7.3%)	61(26.2%)	86(36.9%)	69(29.6%)
Use alcohol/water and soap after touching the product	24(10.3%)	61(26.2%)	75(32.2%)	73(31.3%)
Wear PPE	57(24.5%)	93(39.9%)	33(14.2%)	50(21.5%)
@Practicing COVID 19 prevention strategies=48.9%, mean ± SD=14.01± 2.71, Range=1-14				

Institutional Factors

About half (48.9%) of the study participants had not ever taken infection prevention training. Only 58.4% of the study respondents said that Industry has post-exposure prophylaxis while 87.1% assured that there is a washing service in the compound of the industry. More than one-third (36.5%) of the study participants guaranteed that there is no sufficient personal protective equipment. About three fourth (79.4%) of the respondents said that there is the availability of soap and water in Yirgalem Agro-Industrial Park (Table 5).

Table 5 Institution-related factors towards COVID-19 Prevention, Yirgalem, Sidama Region, Ethiopia, 2020 (n=233)

Characteristics	Yes	No	Don't know

The industry has a washing service	203(87.1%)	25(10.7%)	5(2.1%)
The industry has IPC guideline	152(65.2%)	24(10.3%)	57(24.5%)
Industry has PEP	136(58.4%)	50(21.5%)	47(20.2%)
Industry regular training on IPC	114(48.9%)	43(18.5%)	76(32.6%)
Is PPE sufficient	93(39.9%)	85(36.5%)	55(23.6%)
Is alcohol available	157(67.4%)	55(23.6%)	21(9%)
Are soap and water available	185 (79.4%)	41(17.6%)	7(3%)

Significant Factors

According to the findings of bivariate analysis sex, Age, Marital status, educational status, spiritual cause or sin, training, Good knowledge, positive attitude, Mask wearing, and Traditional Medicine as a cure was significantly associated with COVID-19 prevention practices. But, after running a multivariate analysis, Age, spiritual cause or sin, training, knowledge, attitude, mask-wearing, ordinary residents mask wearing and winning chance of COVID battle were remain significantly associated with the COVID-19 prevention practices at 95% confidence interval and p-value <0.05.

The odds of practicing COVID-19 prevention strategies among workers of age 45 years or more was about 7 times (AOR=6.86; 95% CI: 1.51-31.21) compared to workers aged 15 years to 24 years. There were 75% fewer odds of practicing COVID-19 prevention strategies among workers who agree that the cause of COVID-19 is spiritual or sin (AOR=0.25; 95% CI: 0.11-0.56) compare to Workers who disagree that the cause is spiritual or sin. The odds of Practicing COVID-19 prevention strategies were 55% less among trained workers (AOR=0.45; 95% CI: 0.22-0.92) compared to the workers who hadn't taken COVID-19-related training. There were 97% fewer odds of practicing COVID-19 prevention strategies among workers who had poor knowledge (AOR=0.03, 95% CI: 0.01-0.27) compared to workers who had good knowledge. Similarly, there were 88% fewer odds of practicing COVID-19 prevention strategies among workers who had negative attitudes (AOR=0.12; 95% CI: 0.05-0.34) compared to industrial park workers who had a positive attitude toward COVID-19. The odds of practicing COVID-19 prevention strategies among Industrial park workers who were neutral to opposing mask-wearing were reduced by 78% compared to workers who disagree to oppose mask-wearing (AOR=0.22; 95% CI: 0.06-0.85). There were 90% fewer odds of practicing COVID-19 prevention strategies among workers who said ordinary residents should wear masks compare to their counterparts (AOR=0.10; 95% CI: 0.01-0.79). The odds of practicing COVID-19 prevention strategies among workers who said leaders can win the COVID-19 battle was three times (AOR=3.03, 95% CI: 1.30-7.07) more compare to their counterparts (Table 6).

Table 6 Multivariate Logistic Regression analysis results for practicing COVID-19 prevention strategies, Yirgalem, Sidama Region, 2020 (n = 233)

Variables	Categories	Practice		Crude OR	Adjusted OR (95% CI)
		Good	Poor	(95% CI)	
		N (%)	N (%)		

sex	Female	36(40%)	54(60%)	0.56(0.33%-0.95%)*	0.53(0.26%-1.08%)
	Male	78(54.5%)	65(45.5%)	1	1
Age	15-24	21(33.3%)	42(66.7%)	1	1
	25-34	60(51.7%)	56(48.3%)	2.14(1.13%-4.06%)*	2.07(0.86%-4.98%)
	35-44	20(58.8%)	14(41.2%)	2.86(1.21%-6.76%)*	2.19(0.69%-6.91%)
	≥ 45	13(65%)	7(35%)	3.71(1.29%-10.69%)*	6.86(1.51%-31.21%)*
Residence	Yirgalem	97(50.8%)	92(49.2%)	1	1
	Hawassa	11(47.8%)	12(52.2%)	0.89(0.37%-2.11%)	1.43 (0.45%-4.53%)
	Other	6(31.6%)	13(68.4%)	0.45(0.16%-1.23%)	0.51(0.44%-1.79%)
Marital status	Unmarried	55(42%)	76(58%)	0.53(0.32%-0.89%)*	0.62(0.30%-1.28%)
	Married	59(57.8%)	43(42.2%)	1	1
Educational status	No formal	5(45.5%)	6(54.5%)	0.59(0.17%-2.09%)	2.15(0.30%-15.28%)
	Below college	57(42.9%)	76(57.1%)	0.53(0.31%-0.92%)*	1.36(0.66%-2.81%)
	College/above	52(58.4%)	37(41.6%)	1	1
caused by Spiritual or sin	Disagree	52(67.5%)	25(32.5%)	1	1
	Neutral	18(60%)	12(40%)	0.72(0.30-1.73)	0.85(0.27%-2.67%)
	Agree	44(34.9%)	81(65.1%)	0.26(0.14-0.47)***	0.25(0.11%-0.56%)**
Get Trained	Yes	66(55.9%)	52(44.1%)	1	1
	No	48(41.7%)	67(58.3%)	0.56(0.34%-0.95%)*	0.45(0.22%-0.92%)*
Knowledge	Poor	2(10.5%)	17(89.5%)	0.12(0.02%-0.48%)**	0.03(0.01%-0.27%)***
	Good	112(52.3%)	102(47.7%)	1	1
Attitude	Negative	17(29.3%)	41(70.7%)	0.33(0.18%-0.63%)**	0.12(0.05-0.34)***
	Positive	97(55.4%)	78(44.6%)	1	1
oppose mask wearing	Disagree	37(63.8%)	21(36.2%)	1	1
	Neutral	10(38.5%)	16(61.5%)	0.36(0.14%-0.92%)*	0.22(0.06%-0.85%)*
	Agree	67(45%)	82(55%)	0.46(0.25%-0.87%)*	0.42(0.17%-1.01%)
Residents should wear a mask	Yes	105(47.7%)	115(52.3%)	0.41(0.12%-1.36%)	0.10(0.01%-0.79%)*
	No	9(69.2%)	4(30.8%)	1	1
Leaders can win the COVID battle	Disagree	45(54.9%)	37(45.1%)	1.50(0.86%-2.64%)	3.03(1.30%-7.07%)*
	Neutral	14(50%)	14(50%)	1.24(0.54%-2.81%)	0.99(0.32%-3.05%)
	Agree	55(44.7%)	68(55.3%)	1	1
Isolation and Treatment Reduce the spread	Yes	100(47.4%)	111(52.6%)	1	1
	No	14(63.6%)	8(39.4%)	1.94(1.78%-4.82%)	1.79(0.47%-6.78%)
Traditional medicine can cure COVID	Disagree	53(58.9%)	37(41.1%)	1	1
	Neutral	27(62.8%)	16(37.2%)	1.18(0.56%-2.49%)	2.49(0.86%-7.20%)
	Agree	34(34%)	66(66%)	0.36(0.20%-0.65%)*	0.58(0.27%-1.25%)

*p<0.05, **p<0.01 and ***p<0.001

The categorical reference was selected based on a scientifically meaningful manner

DISCUSSION

DISCUSSION

An Institutional based cross-sectional study was conducted to examine the status of preventive practices and associated factors at Yirgalem Agro-Industrial Park. According to the findings of this study 91.8% of the study participants had good knowledge, 75.1% had a positive attitude, and about half (48.9%) of them had good preventive practices for the prevention of COVID-19. Having good knowledge (91.8%) was higher than the studies conducted in Jimma University Medical center (41.3%), Amhara region (70%), Gondar 82.8%, Uganda (82.4%), China (89%), and Pakistan (90.7%) [6,9-13]. The reason behind the variations might be the time difference at which those studies were conducted. The studies in Jimma, Gondar, and Amhara were conducted in the early stage of the pandemic, thus, the awareness of the disease had not this much disseminated in the early stage. The study in Pakistan was almost similar and its study time could also justify it. The finding was lower than the study conducted in Pakistan 93.2% and Nigeria 99.5% [14,15]. The possible reasons for this variation might be due to changes in the study period, settings, population, and data collection mechanism. The major stated COVID-19 prevention strategies by the study participants were distancing, isolation of suspected individuals, wearing a mask, hand washing, and avoiding touching the nose/mouth before washing hands which was consistent with the recommended strategies for COVID-19 prevention [4,5]. This could be taken as the existence of better awareness of COVID-19 prevention strategies among the Industry park workers. Majorities (88.4%) of the participants stated as COVID-19 spreads through respiratory droplets which was almost in line with findings from Jimma University medical center (95.1%) [9]. The report that indicated all individuals infected by novel coronavirus can develop the severe disease (69.1%) was supportive of the findings from Bangladesh where young children can even develop the complication to the extent of getting died of it [16].

The proportion of people believing that the COVID-19 pandemic will be controlled at the end (63.1%) was slightly higher compared with the proportion of people believing the same in the Bangladesh Study (41.7%) [16]. Changes in the study period, settings, and variations in study participants might be the justification for the differences. More than three fourth (75.1%) of the study participants had a positive attitude towards COVID 19 which was almost in line with the study conducted in Pakistan (82.16%), (90%). However, it was lower than the study finding in Ethiopia (94.7%) [13,14,17]. The justification for this variation might be due to the study population and setting. A study from Nigeria reported as a significant number of the participants (25.06%) had shown poor attitudes toward COVID-19 [18]. However, the majority of the respondents in this study had a positive attitude toward the COVID-19 pandemic and this is higher than those having a moderate attitude in Iran [19]. Unlike the current study, Study in Nigeria was conducted in the early stage of the Pandemic when lack of awareness may be the reason for having a poor attitude. In addition, the reason for the variation from a study in Iran may be the category of attitude classification which was in the Likert scale while this study only dichotomized the Attitude, thus, the percentage distribution may be less when the class of the category is increased.

There were differences in proportion between practices of COVID-19 prevention strategies in this study (48.9%) and findings from Northern Ethiopia, and Addis Ababa where 62%, 67%, and 49% of the respondents had good practice of prevention strategies respectively [10,20,21]. The reason for the difference can be the variation in profession that the study in Amhara was conducted on health professionals who have direct professional linkage with that issue and this may support them to have relatively better practices. On the other hand, respondents in Addis

Ababa were an urban population that might have good access to information and technology. Late nationwide training on COVID-19 prevention strategies following its spread could be considered as the reason for almost closer proportion with the findings of Addis Ababa (Table 4).

Practicing COVID-19 prevention strategies was significantly associated with age, belief in the spiritual cause, prior training, knowledge, attitude, Opposing mask-wearing, and belief in defeating COVID-19.

The odds of practicing COVID-19 prevention strategies among workers of age 45 years or more was about 7 times compared to workers aged 15 years to 24 years (AOR=6.86; 95% CI: 1.51-31.21). This finding was consistent with the study conducted in Northwestern Ethiopia and Uganda [11,12]. This might be since chronic medical illness increase with age and the existence of those chronic illnesses increase the severity of COVID-19. Adherence to COVID-19 prevention strategies might be due to the fear related to this fact.

There were 75% fewer odds of practicing COVID-19 prevention strategies among workers who agree that the cause of COVID-19 is spiritual or sin (AOR=0.25; 95% CI: 0.11-0.56) compare to Industrial workers who disagree that the cause is spiritual or sin. COVID-19 is zoonotic and tends to be transmitted between animals to humans and humans to humans through droplets, close contact, or other means, and as stated those study participants who didn't know this reality was not practicing COVID-19 prevention strategies [17].

The odds of Practicing COVID-19 prevention strategies were 55% less among untrained Industrial park workers (AOR=0.45; 95% CI: 0.22-0.92) compared to the workers who took COVID-19-related training. This finding was consistent with the finding of a study conducted in Zambia [22]. It is also logical to believe that having prior COVID-19 training increase workers' awareness and is basic for practicing COVID-19 prevention strategies. There were 97% fewer odds of practicing COVID-19 prevention strategies among workers who had poor knowledge (AOR=0.03, 95% CI: 0.01-0.27) compared to workers who had good knowledge. This study finding was in line with the study conducted in northern Ethiopia [11]. This might be since getting awareness or knowledge on COVID-19 prevention strategies precedes the practice of COVID-19 prevention strategies.

The attitude of a human being is the result of his or her judgment towards something [23]. The majority of people who judged something as positively could practice the event better and the reverse is true for the majority of people who judged something negatively [24]. Our study supported such facts and reported that the odds of practicing COVID-19 prevention strategies among workers who had negative attitudes were 88% less compared to industrial park workers who had a positive attitude toward COVID-19. This finding was consistent with various studies conducted in Ethiopia, Egypt, China, and Saudi Arabia and all studies revealed that favorable attitudes towards COVID-19 preventive measures were significantly associated with good adherence to COVID-19 mitigation measures [20,25-27].

The odds of practicing COVID-19 prevention strategies among Industrial park workers who were neutral to opposing mask-wearing were reduced by 78% compared to workers who disagree to oppose mask-wearing (AOR=0.22; 95% CI: 0.06-0.85). This might be due to the reason that mask-wearing is among the first line of COVID-19 prevention strategies and being neutral for mask-wearing means that those industrial workers had less likely to implement or practice other COVID-19 prevention strategies. There were 90% less odds of practicing COVID-19 prevention strategies among workers who said ordinary residents should wear masks compare to their

counterparts (AOR=0.10; 95% CI: 0.01-0.79). This indicates the awareness gap among the respondents because ordinary people are expected to have less risk of exposure compared to those people around risk-prone areas. The odds of practicing COVID-19 prevention strategies among workers who said leaders can win the COVID-19 battle was three times (AOR=3.03, 95% CI: 1.30-7.07) more compare to their counterparts. This indicates that the hope in world leaders and technology motivated those people to adequately practice COVID-19 Prevention Strategies.

LIMITATIONS

This study has its limitation. Generalization of the study findings to other Agro-industrial workers in the country is impossible since this study was conducted only in one institution (i.e. Yirgalem Agro-Industrial Park). Some degree of selection bias may not be ruled out since the participation was voluntary and the chance of participating is high among those who had a better understanding or attitude towards the practice of COVID-19 prevention strategies. This could lead to an overestimation of the practice.

As this is an institutional-based cross-sectional study, the limitations that come up with this type of study design need to be taken into consideration in interpreting the results/findings.

CONCLUSION

According to the findings of this study 91.8% of the study participants had good knowledge, 75.1% had a positive attitude and about half of them (48.9%) had good preventive practices for the prevention of COVID-19. Practicing COVID-19 prevention strategies was significantly associated with age, belief in spiritual/sin as a cause, prior training, knowledge, attitude, Opposing mask-wearing, and belief in whether to defeat COVID-19 or not. The top management of the Yirgalem Agro Industry is better to conduct awareness creation/intensive training activities on COVID-19 prevention strategies and then enforce policies for effective implementation.

DECLARATIONS

Abbreviation

AU: African Union

COVID-19: Corona Virus Disease of 2019

ETB: Ethiopian Birr

nCOV: Novel Corona Virus

USA: United States of America

WHO: World Health Organization

Ethical Considerations

Ethical clearance was obtained from the Institutional Review Board (IRB) of Hawassa University, College of medicine and health science. Then letters of cooperation were written to concerned bodies of Yirgalem Agro Industrial Park and formal Permission was obtained from the manager. A consent format was distributed and informed consent was obtained from each respondent before data collection. Data collection was done with the

assigned data collectors. Necessary attention was paid to maintaining and preserving the anonymity of the study subjects in the presentation of data. Care was taken from disclosing the confidentiality of study participants. To assuring this, all collected data were first coded and then locked in a separate room before undertaking data entry and no personal identifier was included in the data collection formats.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Consent for Publication

Not applicable.

Computing Interest

The authors declare that they have no competing interests.

Authors Contribution

GK and AT Conceived and design the idea, participated in the data collection and analysis process, wrote the paper, and developed the manuscript. AT and MS participated in developing a proposal, data analysis, and developing the manuscript. All authors approved the final draft of the manuscript.

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