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ABSTRACT

BACKGROUND: The coronavirus has developed into a global public emergency. Different preventive measures like handwashing stations, isolation chambers, and personal protective equipment are frequently insufficient in prisons and detention facilities. Furthermore, there were significant dangers of infection from close contact with incarcerated people and prison and detention center staff. The purpose of this study was to evaluate the awareness of COVID-19 prevention strategies among correctional facility staff in the Bench-Sheko Zone, southwest Ethiopia.

METHODS: Between May and June 2020, an institutional-based cross-sectional study was carried out among selected individuals who were correctional facility staff located in the Bench-Sheko zone at the time the data were collected. The study participants were chosen using a stratified systematic random sampling technique. Epi-data 3.1 was used to enter the data, and SPSS version 22 was used to analyze it. To find a candidate and an independent factor, respectively, bivariate and multivariable logistic regression analyses were utilized.

RESULTS: The levels of knowledge and practice toward COVID-19 were 41.5% and 39.5% respectively. Working in detention [AOR: 4.7, 95% CI: 2.1-10.5)] was also a risk factor for poor knowledge, and among the population working in detention, rural residence [AOR: 5.6, 95% CI: 2.2-14.3)], and lower educational level [AOR: 9.4, 95% CI: 3.3-26.9)] were additional risk factors for poor knowledge. Furthermore, for people working in detention, lower education levels [AOR: 4.3, 95% CI: 1.3-14)], poor knowledge [AOR: 3.3, 95% CI: 1.6-6.8)], and poor attitude [AOR: 9.1, 95% CI: 1.9-43.7)], were associated with poor preventive practice.

CONCLUSION AND RECOMMENDATION: Prison and detention center staff had poor knowledge and preventive measures toward COVID-19. An upcoming educational intervention is recommended to raise awareness of the diseases. Moreover, the decarcerating strategy also needs to be considered to mitigate COVID.

KEYWORDS: Prison, COVID-19, detention center, knowledge, practice

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Introduction

Emerging infectious illnesses caused by zoonoses remain a serious worldwide health problem, especially in less developed nations.[1] The pandemic of Coronavirus disease (COVID-19) caused by SARS-CoV-2 is brought on by the SARS-CoV-2 coronavirus has been classified as a zoonotic disease.[2] COVID-19 was first discovered in Wuhan, China, in December 2019, it was quickly distributed, and the COVID-19 outbreak was declared a pandemic on March 12, 2020.[3]

Most COVID-19 virus-infected individuals will experience a mild to severe respiratory infection and recover without the need for special care. Serious illnesses are more likely to emerge in older people and those with underlying medical conditions such as cardiovascular disease, diabetes, chronic respiratory disease, and cancer.[4] Furthermore, a psychosocial crisis could result from the COVID-19 outbreak and infodemic quarantine.[5-7]

Environmental pollution and rising human population density are the main causes of emerging illnesses.[8] According to a study, incarcerated people had higher rates of infectious diseases like HIV, HCV, HBV, and tuberculosis than the general community.[9] The incarcerated people in prisons are more prone to higher chances of COVID-19 infection because of their restricted mobility and almost inescapable interaction.[10] Furthermore, they may be older, with severely less mobility/autonomy, and more likely to suffer from a chronic condition, making them more vulnerable to severe COVID.[11] SARS-CoV-2 can be detected in the air 3 hours after aerosolization, according to research to date.[12] Prison and detention centers are mostly indoor facilities in which maximum air exchange has happened. Accordingly, aerosolized spread is a common transmission pathway in carceral settings.[13]

Pathogenic infections are not well controlled in prisons.[14] As part of the larger public health response to the COVID-19

pandemic, it is important to take into account that the population housed in prison and detention institutions is more susceptible to infections than the general population.[15] Prison officials and incarcerated people who live in cramped quarters are required to share everything (air, water, kitchen), which exposes them to the same infections. People who live in prison are housed close to one another, which raises the possibility of infections like the COVID-19 outbreak spreading from person to person and by droplets.[16]

The World Health Organization's recommended Efforts to control COVID-19 in the community are likely to fail if strong infection prevention and control (IPC) measures, adequate testing, treatment, and care are not carried out in prisons and other places of detention as well.[17] The New Strategic Protocol of Prevention methods was a screening of the entire population (prisoners and workers) inside the prison and the reduction in overcrowding in prisons,[18] and only a few studies concerned the prevention of COVID-19 infection through vaccination and the implementation of quarantine.[18,19] Moreover, attention needs to be paid specifically to the relationship between the jail and the community it serves, including visitors, incarcerated people, and the high staff turnover rate.[20]

Despite the significant risk of COVID-19, no study has examined the knowledge of and preventive measures taken by staff members of prisons and detention facilities, particularly in Ethiopia. The employees in prisons and detention facilities in southwest Ethiopia were the subject of this study, which sought to evaluate their awareness of and practices for prevention against the COVID-19 epidemic. So the objective of this study was to assess the awareness of COVID-19 prevention strategies among prison and detention center staff in the Bench-Sheko Zone, south-west Ethiopia

Methods and Materials

Study design, area, and period

An institutional-based cross-sectional study was conducted in Bench-Sheko zone from May 01 up to June 30, 2020. Bench Sheko zone is located 561 km southwest of Addis Ababa, the capital city of Ethiopia. The zone has an estimated population of 829 493 and the primary health service coverage of the zone is 92.6% covering a total catchment area of 19 965.8 Km^2, with the majority (1 061 120, 86%) of the population living in the rural areas. The zone has about 2 hospitals and 39 functional health centers. In addition, the zone has 1 prison institution and 8 detention centers, and more than 1200 prisons are currently present in the institution. The zone has a total of 380 correctional facility staff who are working in prison and detention centers.

Study population

All correctional facility staff located in the Bench-Sheko zone at the time the data were collected were the study population. Staff members who were very ill and hard of hearing were not allowed to participate.

Sampling size and sampling techniques

The single population proportion formula was used to calculate the sample size. Because there hasn't been any research on the knowledge and preventive measures of correctional facility staff in Africa, including Ethiopia, we used 50% as the sample size.

$$n = \frac{Z_{\frac{a}{2}}^{2} \times p(1-p)}{d^2}$$

Where: n =sample size

Z = Reliability coefficient with 95% confidence level = 1.96

P = Population variance available from previous data (q = 1-p)

d = Degree of precision or margin of error = 0.05

$$n = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} = 384$$

We had to consider the correction formula, nf = n/1 + n/N, because the average staff size in prisons and detention facilities was 460, which is less than 10 000. As a result, the final sample size was changed to 209. Simple random sampling was used to choose locations for all prisons and 13% of detention facilities. Lastly, the study subjects were chosen using stratified systematic random selection approaches.

Study variables and measurements

The dependent variables were knowledge and practice. The independent variables were socio-demographic characteristics (age, age sex, marital status, ethnicity, religion, facility type, and education level).

Good knowledge: Those respondents who scored mean and above were categorized as having good knowledge. **Poor knowledge:** Those respondents who scored below the mean were categorized as having poor knowledge. **Good practice:** Those respondents who score mean and above were categorized as having good practice. **Poor practice:** Those respondents who scored below the mean were categorized as having poor practice.

Data collection and quality control. To maintain uniformity, the questionnaire was translated into both Amharic and English and then back into the original language. Four BSc nurses who were under the supervision of a BSc public professional collected the data. Data collectors received 2 days of training on the purpose of the study, what was included in the questionnaire, how interviews were conducted, and other related topics. Principal investigators and supervisors were in charge of overseeing the data-gathering process and regularly evaluating its accuracy and consistency.

Data management and analysis

After being cleaned, updated, and coded, the data was imported into Epi Data Manager and exported to SPSS software version 25. To check for potential inaccuracies in the data printed out, data coding and cleaning were performed. A descriptive analysis was performed before further analysis to check for missing values and outliers. The following descriptive statistics are provided for all independent variables: mean scores, standard deviation, frequency, and percentages. To determine the parameters influencing the knowledge and practice of the correctional facility staff regarding the COVID-19 pandemic, respectively, bivariate and multivariable logistic regression analyses were performed in analytical statistics. The model was created using a backward likelihood ratio with 0.1 removals as the probability. The Hosmer-Lemeshow test of goodness of fit, which considers good fit at all levels, was used to assess the final model's goodness of fit.

Results

Socio-demographic characteristics

The study was completed by 195 of the 209 employees, for a response rate of 93.3%. More than three-fourths (76.4%) and 46 (23.6%) of the participants came from urban and rural settings, respectively. The mean age was 35 ± 8 years. Eighty-four (43.1%) and 50 (25.6%) of the participants were Orthodox by religion and Kaffa by ethnicity, respectively (Table 1).

Table 1. Socio-demographic characteristics of staff of prison and detention center in Bench-Sheko zone, Southwest Ethiopia (N = 195).

VARIABLES	CATEGORIES	FREQUENCY (N)	PERCENT (%)
Facility type	Prison	88	45.1
	Detention	107	54.9
Age	<35	101	51.8
	⩾35	94	48.2
Sex	Male	137	70.3
	Female	58	29.7
Residence	Rural	46	23.6
	Urban	149	76.4
Religion	Orthodox	84	43.1
	Protestant	72	36.9
	Muslim	31	15.9
	Others	8	4.1
Ethnicity	Kaffa	50	25.6
	Bench	40	20.5
	Oromo	46	23.6
	Amhara	36	18.5
	Others	9	4.6
Marital status	Single	56	28.7
	Married	106	54.4
	Widowed	21	10.8
	Live together without marriage	12	6.2
Educational level	Can read &write	74	37.9
	Diploma	89	45.6
	Degree and above	32	16.4

Knowledge and practice toward COVID-19

This study evaluated the correctional facility staff's knowledge of the most recent coronavirus (COVID-19). Almost all (99%) had heard of the new coronavirus. Approximately 39% of respondents cite television as their primary information source (Figure 1). One hundred eighty-five (94.9%) specified at least one method of novel coronavirus transmission (COVID-19). One hundred twenty-four (63.6%) stated physical distance as a preventative measure (Table 2). Nearly one-fourths (23.3%) of the respondents indicated fever as a clinical symptom, followed by 17.2% dry cough and 17% trouble breathing (Figure 2). One hundred fifty-seven (80.5) of the participants regularly washed their hands to prevent the coronavirus, and 118 (60.5) avoided shaking their hands (Table 3). The percentages of prison and jail staff who had a good understanding of and practices to avoid the COVID-19 pandemic were 41.5% (95% CI: 34.4-48.3) and 39.5% (95% CI: 32.8-46.2), respectively (Figure 3).

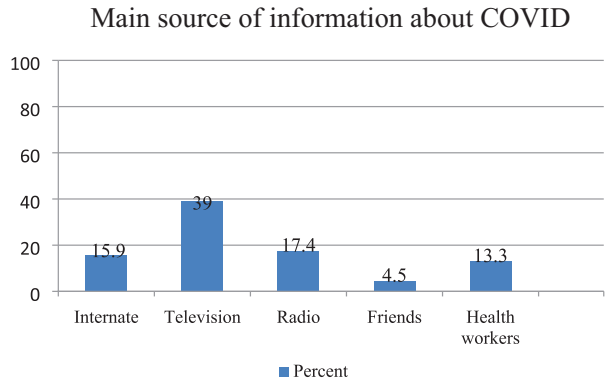

Figure 1. Main sources of information about the COVID-19 pandemic among the staff of prison and detention center in Bench-Sheko zone, Southwest Ethiopia (N = 195).

Factors associated with poor knowledge and practice

The levels of knowledge and practice toward COVID-19 were 41.5% and 39.5% respectively. Working in detention [AOR: 4.7, 95% CI: 2.1-10.5)] was also a risk factor for poor knowledge, and among the population working in detention, rural residence [AOR: 5.6, 95% CI: 2.2-14.3)],

Table 2. knowledge of the COVID-19 pandemic among Staff of prison and detention center in Bench-Sheko zone, Southwest Ethiopia (N = 195).

VARIABLES	CATEGORY		FREQUENCY	PERCENT
COVID-19 transmission	Droplet during sneezing	Yes	90	46.2
		No	105	53.8
	Droplet during Coughing	Yes	88	45.1
		No	107	54.9
	Droplet during Breathing	Yes	90	46.2
		No	105	53.8
	Droplet during Talking	Yes	65	33.3
		No	130	66.7
	Close contact	Yes	136	69.7
		No	59	30.3
COVID-19 prevention	Avoid crowded place	Yes	120	61.5
		No	75	38.5
	Avoid public transportation	Yes	48	24.6
		No	147	76.4
	Avoid shaking hands	Yes	118	60.5
		No	77	39.5
	Physical distancing	Yes	124	63.6
		No	71	36.4
	Avoid touching eyes and nose	Yes	106	54.4
		No	89	45.6
	Wash hands with soap and water	Yes	124	63.6
		No	71	36.4
	Covering cough using the bend of your elbow	Yes	82	42.1
		No	113	57.9
	Staying at home	Yes	76	39
		No	119	61
	Follow the advice of your healthcare provider	Yes	107	54.9
		No	88	45.1
Call center for corona		Yes	151	77.4
		No	44	32.6
Supportive treatment help recover from COVID-19		Yes	161	82.6
		No	34	18.4
Chronic illness, elderly and obese are at risk		Yes	148	75.9
		No	47	24.1
Patients with no symptoms cannot transmit the virus		Yes	174	89.2
		No	21	10.8
contact with someone with COVID-19 positive virus should be isolated		Yes	192	98.5
		No	3	1.5

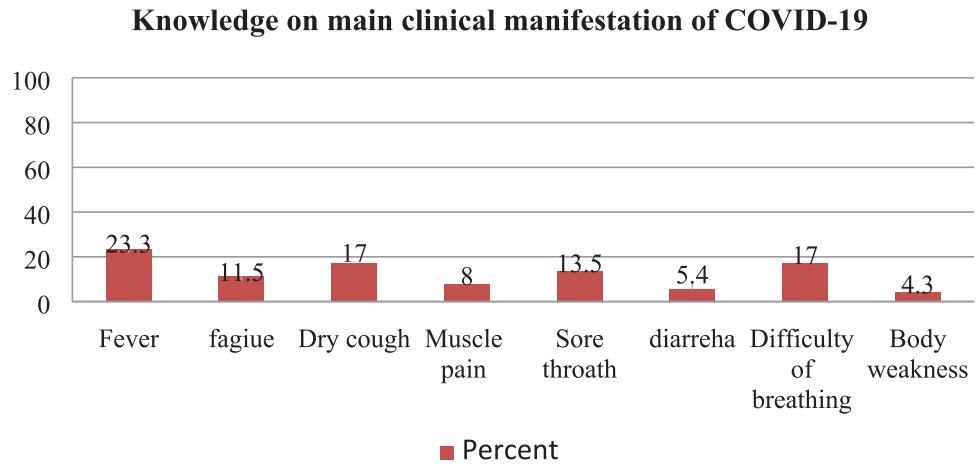

Figure 2. Knowledge on main clinical manifestation of the COVID-19 pandemic among the staff of prison and detention in Southwest Ethiopia (N = 195).

Table 3. Preventive practice toward COVID-19 pandemic Among Staff of prison and detention center in Bench-Sheko zone, Southwest Ethiopia (N = 195).

VARIABLES	YES, N (%)	NO, N (%)
Avoid crowded place	76 (39.0)	119 (61.0)
Avoid public transportation	35 (17.9)	160 (82.1)
Avoid shaking hands	118 (60.5)	77 (29.5)
Physical distancing	94 (48.2)	101 (51.8)
Avoid touching eyes and nose	98 (50.3)	97 (49.7)
Wash hands with soap and water	157 (80.5)	38 (19.5)
Covering cough using the bend of your elbow	80 (41.0)	115 (69.0)
Staying at home	36 (18.5)	159 (81.5)
Follow the advice of your healthcare provider	59 (30.3)	136 (59.7)

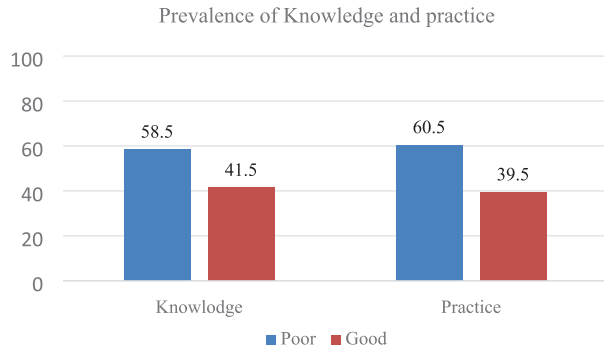

Figure 3. Prevalence of knowledge and preventive practice toward COVID-19 Pandemic among the staff of prison and detention center in Bench-Sheko zone, Southwest Ethiopia (N = 195).

and lower educational level [AOR: 9.4, 95% CI: 3.3-26.9)] were additional risk factors for poor knowledge (Table 4). Furthermore, for people working in detention, lower education levels [AOR: 4.3, 95% CI: 1.3-14)], poor knowledge [AOR: 3.3, 95% CI: 1.6-6.8)], and poor attitude [AOR: 9.1, 95% CI: 1.9-43.7)], were associated with poor preventive practice (Table 5).

Discussion

With the higher levels of risk factors for infection (like overcrowding, and poor sanitation), poor ventilation, and limited access to healthcare services compared to the general population, people in prisons and detention institutions are more vulnerable to communicable diseases. People living in prison in those facilities are housed close to one another, which raises the possibility of diseases like COVID-19 spreading from person to person and via droplets. The correctional facility staff of prisons and detention facilities in southwest Ethiopia were evaluated for their knowledge and practice habits.

In our survey, 41.5% of personnel employed by prisons and correctional facilities reported having a strong understanding of the COVID-19 pandemic. Even though this percentage of the study population has a strong understanding, the majority of people do not feel responsible for protecting this highly vulnerable population. Only 16.4% of the participants had a degree or above; as a result, the low percentage of participants with higher education levels may have contributed to the prevalence of inadequate knowledge in our study. This outcome was lower than that of other studies carried out in China and 3 Arab nations (Jordan, Saudi Arabia, and Kuwait), which had good knowledge of 72% and 90%, respectively.[21,22] It might be related to disparities in education, income, and access to medical services.

The results demonstrate that 60.5% (95% CI: 52.5%-68.2%) of personnel employed by prisons and correctional facilities had subpar practices for putting COVID-19 preventive measures into action. Other studies carried out in China and India indicated 5% and 4.5%, respectively, which puts this outcome considerably behind those results.[22,23] This may be brought on by variations in the pandemic's perceived severity, death rate, and media exposure. Additionally, it might result from variations in how easily accessible personal protective equipment is.

Table 4. Factors associated with knowledge of the COVID-19 pandemic among the staff of prison and detention center in Bench-Sheko zone, Southwest Ethiopia (N = 195).

VARIABLES	CATEGORIES	POOR KNOWLEDGE NO. (%)	GOOD KNOWLEDGE NO. (%)	COR (95% CI)	AOR (95% CI)	*P*-VALUE
Facility type	Prison	57 (50.0)	30 (37.0)	1	1	
	Detention	57 (50.0)	51 (63.0)	1.6 (0.9-2.8)	4.7 (2.1-10.5)	<.001
Age	<35	63 (55.3)	38 (46.9)	1.4 (0.8-2.5)	1.0 (0.5-2.1)	.85
	⩾35	51 (44.7)	43 (53.1)	1	1	
Residence	Rural	34 (29.8)	12 (14.8)	2.4 (1.2-5.1)	5.6 (2.2-14.3)	<.001
	Urban	80 (70.2)	69 (85.2)	1	1	
Ethnicity	Bench	22 (19.3)	18 (22.2)	1	1	
	Kaffa	21 (18.4)	29 (35.8)	0.6 (0.25-1.4)	1.1 (0.3-3.8)	.085
	Amhara	22 (19.3)	14 (17.3)	1.3 (0.5-3.2)	1.4 (0.5-3.9)	.754
	Oromo	34 (29.8)	12 (14.8)	2.3 (0.9-5.7)	2.9 (0.9-9.5)	.531
	Sheka	10 (8.8)	4 (4.9)	2.0 (0.5-7.6)	3.6 (0.8-16.2)	.069
	Others	5 (4.4.)	4 (4.9)	1.0 (0.23-4.3)	1.3 (0.2-7.1)	.766
Marital status	Single	28 (24.6)	28 (34.6)	1	1	
	Married	67 (58.8)	39 (48.1)	1.7 (0.9-3.3)	1.7 (0.8-3.6)	.147
	Widowed	11 (9.6)	10 (12.3)	1.1 (0.4-3.0)	1.7 (0.6-4.5)	.819
	Live together without married	8 (7.6)	4 (4.9)	2.0 (0.5-7.4)	4.3 (0.9-25.7)	.280
Educational level	read and write	57 (50.0)	17 (21.0)	4.9 (2.0-11.9)	9.4 (3.3-26.9)	<.0001
	Diploma	44 (38.6)	45 (55.6)	1.4 (0.6-3.2)	1.3 (0.5-3.1)	
	Degree and above	13 (11.4)	19 (23.5)	1	1	

When compared to prison employees, detention staff were found to be 4.2 times more likely to have inadequate knowledge of COVID-19. American reports backed up this conclusion.[24] It can be because detention centers lack health facilities, they use resources inefficiently, the government doesn't put much emphasis on them, or information is more difficult to acquire there than in prisons.

Based on their place of residence, respondents with low understanding were 4.2 times more likely to be from rural areas than urban ones. An Ethiopian investigation that was undertaken backs up this conclusion.[25] It might be brought on by disparities in socio-demographics, lifestyle, and access to and use of social media. Additionally, this study showed that employees with lower educational backgrounds were 14.6 times more likely to have a weak understanding than employees with higher educational backgrounds. High education level was a significant predictor of increased understanding of COVID-19 in a study conducted in 3 Arab nations (Jordan, Saudi Arabia, and Kuwait), and among Chinese residents, which was consistent with this study.[21,26] It might be related to accessibility and exposure to both domestic and foreign mass media. It can also be a result of variations among study participants.

The main determining criteria for using effective COVID-19 prevention methods were the respondents' educational level, knowledge, and attitude toward COVID-19. Staff members working in prisons and detention facilities who can only read and write were 4.3 times more likely to practice COVID-19 preventive measures improperly than staff members with higher educational status. An Iranian study that found that the respondent's level of education influences how effectively COVID-19 preventive measures are used supports this study.[27] It indicated that educational level plays a pivotal role in the prevention of communicable diseases such as COVID-19.

According to this study, personnel employed by prisons and correctional facilities who had low understanding were 3.3 times less likely to apply COVID-19 preventive actions than those who had excellent knowledge. When it came to

Table 5. Factors associated with prevention practice of COVID-19 among staffs of prison and detention center in Bench-Sheko zone, Southwest Ethiopia (N = 195).

VARIABLES	CATEGORIES	POOR PRACTICE NO. (%)	GOOD PRACTICE NO. (%)	COR (95% CI)	AOR (95% CI)	*P*-VALUE
Sex	Male	77 (65.3)	60 (77.9)	1	1	
	Female	41 (34.7)	17 (22.1)	1.9 (0.9-3.6)	0.5 (0.2-1.1)	.118
Residence	Rural	32 (27.1)	14 (18.2)	1.6 (0.8-3.4)	1.1 (0.5-2.6)	.741
	Urban	86 (72.9)	63 (81.8)	1	1	
Ethnicity	Bench	22 (18.6)	18 (23.4)	1	1	
	Sheka	7 (5.9)	7 (9.1)	0.8 (0.2-2.7)	0.6 (0.2-2.6)	.546
	Kaffa	24 (20.3)	26 (33.8)	0.7 (0.3-1.7)	1.0 (0.4-2.7)	.950
	Amhara	24 (20.3)	12 (15.6)	1.6 (0.6-4.2)	2.1 (0.7-6.0)	.168
	Oromo	32 (27.1)	44 (18.2)	1.8 (0.7-4.5)	1.6 (0.6-4.5)	.345
	Others	9 (7.6)	4 (4.9)	1.1 (0.5-1.4	0.9 (0.6-1.8)	.999
Educational level	Read & write	56 (47.5)	18 (23.4)	3.1 (1.3-7.4)	4.3 (1.3-14)	.015
	Diploma	46 (39.0)	43 (55.8)	1.1 (0.5-2.4)	1.8 (0.6-5.5)	.265
	Degree & above	16 (13.6)	16 (20.8)	1		
Knowledge	Poor	86 (72.9)	28 (36.4)	4.7 (2.5-8.7)	3.3 (1.6-6.8)	.001
	Good	32 (27.1)	49 (63.6)	1	1	
Attitude	Negative	22 (18.6)	3 (3.9)	5.6 (1.6-19)	9.1 (1.9-43.7)	.005
	Positive	96 (81.4)	74 (96.1)	1	1	

acceptable practices for COVID-19 prevention, jail and prison staff that had negative views were 9.1 times more at risk than those who had favorable attitudes. This result was in line with research conducted in China and Jordan, which showed that respondents with a favorable attitude toward COVID-19 prevention behaviors also exhibit good prevention practices.[22,23]

Conclusion and recommendation

According to the results of the current study, the majority of the prison and detention staff that was located in south-west Ethiopia had an inadequate understanding of and poor behavior related to the prevention and control of COVID-19 outbreaks. The independent knowledge components were a place of residence, level of education, and facility type. In addition, practice toward COVID-19 preventive measures was influenced independently by knowledge, educational attainment, and attitude. Future educational initiatives are encouraged to promote awareness of this illness among staff, incarcerated people, and detainees and should concentrate on prison facilities and rural detainee centers that lack resources and amenities. Lessons should be easier to understand and convey in their tongues. To help debunk myths and misconceptions concerning the illness, it is advised that regular communication take place between detention and prison employees, healthcare professionals, and the general public.

Limitations of the Study

The cross-sectional nature of the data makes it difficult to conclude the direction of relations among study variables. Moreover, our study only looked at the educational awareness of prison and detention center staff in southwest Ethiopia regarding COVID-19, which does not address other strategies to address or mitigate the spread of this virus in congregate settings such as reducing overcrowding.

Acknowledgements

We appreciate Mizan-Tepi University's financial assistance. Additional gratitude is extended to the Bench-Sheko Zones health department officials for providing background data on the study locations. Additionally, we appreciate everyone who freely took part in the survey.

Authors' Contribution

NS and TY wrote the protocol, participated in data collection, analyzed the data, and wrote the manuscript. All authors read and approved the final manuscript.

Availability of Data and Materials

We will make the datasets produced and analyzed during the project available to organizations and people upon reasonable request.

Consent for Publication

Not applicable

Ethical Consideration

From Mizan-Tepi University, an ethical letter was acquired. From the zonal health bureau, a formal letter of cooperation was acquired. Participants were informed before the interviews, and they were offered the ability to withdraw from the study at any time, as well as assurances of their voluntary participation and confidentiality. A description of the study's nature, dangers, and benefits was also provided, along with an explanation of the study's goal. Following that, participants' signed consent was collected.

List of abbreviations

AOR: Adjusted Odds Ratio; BSc: Bachelor of Science; CI: Confidence Interval; COR: Crude Odds Ratio; COVID-19: 2019 Novel Coronavirus; SD: Standard Deviation; SPSS: Statistical Package for the Social Sciences.

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