Seroprevalence of Antivirals and Risks of Acquiring among Quarantined Individuals in North West Ethiopia: A Survey Study

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ABSTRACT

Novel coronavirus 2019 (COVID-19) is a worldwide spreading pandemic respiratory disease caused by a positive single strand (RNA) virus. The efforts for preventing COVID-19 pandemic remain fruitless and ineffective. So this study aims to assess Seroprevalence, Knowledge and Practice of COVID-19 prevention among quarantined individual in North West Ethiopia.

Methods: Institutional-based survey was conducted on COVID-19 suspected quarantined individuals from 21 April-30 December 2020. The collected data were edited and enter into EPI-DATA 3.1 version, then export to STATA/R-14 (SE) software for analysis.

Results: Of 4233 quarantined individuals who received the SARS-CoV-2 IgG antibody test, 4230/99.78% were interviewed with a 99.82% response rate. The overall seroprevalence of COVID-19 symptom suspected quarantined individuals in North West Ethiopia was found 5.11, 95% CI (4.4-5.87). The overall knowledge and practice of prevention towards COVID-19 infection on isolated individuals were found 86.17 %(95%CI: 85.1-87.2), and 62.82%; 95% CI: 60.75-63.8).

Conclusion: The sero-prevalence of the quarantined population was high as compared with previously reported. The majority of the respondents know how to prevent themselves from the COVID-19, but changing this prevention knowledge into the practice of tackling was great gap.

Keywords: Sero-prevalence; Knowledge; Practice; Prevention; SARS-CoV-2

INTRODUCTION

The new corona virus (COVID-19) has been identified as the cause of acute respiratory disease since the end of December 2019. Later, the World Health organization labeled it as SARS-CoV2 single strain of RNA virus that belongs to the family corona virus of SARS-COV and MERS-COV, for the recent origin of COVD-19 diseases [1,2]. The difference between them is the genetic make-up, clinical presentations, case fatality, and the rate of spread across the world [3,4]. The route of transmission for COVID-19 is respiratory droplets produced from an infected person while sneezing and coughing. It is also transmitted by infected surfaces and objects since the virus can survive everywhere [4]. The main symptom of COVID-19 range from mild (asymptomatic) to severe illness characterized by fever, dry cough, dyspnea, headache, sore throat, and rhinorrhea rarely associated with hemoptysis and respiratory collapse [4,5]. The aforementioned research reported that the COVID-19 pandemic has no effective treatment, but early recognition of higher-risk conditions, risky practice progresses, and early looking for supportive care will radically suppress the spread of these viruses [6].

In Ethiopia, access to COVID-19 testing had a great barrier to understanding the true prevalence of COVID-19 cases in the community [7]. Despite multiple preventive measurements that have been done previously to avoid this abominable disease from the higher-level organization (WHO) to national levels, the success or failure of these efforts largely rely on behavioral changes of the clients. Community acceptance and readiness for the prevention of COVID-19 are still hindered by the false assurance of perception myths and miss understanding on were living far away from areas where COVID-19 was rampant and still no locally reported cases has reflected [8]. So this study aims to assess the sero-prevalence, knowledge and practice of COVID-19 prevention among quarantined individuals in northwest Ethiopia.

Several articles have been researched to provide information useful for the pathology of SARS-CoV-2, with the ultimate goal of devising an effective treatment for the virus, which will provide the least toxicity possible [1-5].

METHODOLOGY

Study setting

This study was conducted in Benishangul, Gumuz regions in the North-Western part of Ethiopia which is located with 34°10' N and 37°40' E and in the latitude 09°17' N and 12°06' N [9]. The capital city of the region is Assosa, located at a distance of 659 km in the west, and Pawe also located 565 km North West direction of Addis Ababa [10]. This region covered 0.381 (4.6%) square kilometers of national landmass coverage of Ethiopia. According to the 2019 national population projection has an estimated 1.21 million population been survived [11]. According to the Ethiopian Demographic Health Survey (EDHS) of 2016, 77% of those populations live in rural areas, and 23% live in the urban with five indigenous ethnic groups [11]. Presently, this region has two general, and three primary hospitals, with one regional laboratory, which have to withstand daily healthcare services. Nationally, starting from the COVID-19 outbreak, the regional health bureau has established two COVID-19 diagnosed and treatment centers [4]. Bilaterally, the regional health bureau ordered and prepared interview plate-form for all quarantined individuals during care observation. The projection focused on awareness about the mode of transmission, clinical features, and prevention measures for multilateral community intervention during a pandemic [12]. Entirely, in the quarantine centers, 4233 COVID-19 symptom suspected individuals diagnosed to identify individuals who has COVID-19 on his/her blood serum.

Study design and periods

Institution-based survey was conducted from 21, April 2020-30 December 2020.

Study populations

All quarantined individuals from two quarantine center in Benishangul Gumuz Region.

Sample size determination

Since it was the survey study all quarantined individuals in both quarantine centers included.

Operational definition

Positive sero-prevalence: Quarantined individuals the SARS-CoV-2 IgG antibody test declared having COVID-19 positive results after testing.

Knowledge: The assessment part of knowledge includes about COVID-19 pandemics, using five different dimensions COVID-19 background knowledge using (three items), on sign and symptom (two-item), mode of transmission (six items), and on prevention methods (5) items, and by employing Bloom's cut off point classification range for knowledge, attitude, and practice question classification guideline. Which considered "good" was scored ranges 80%-100%, and "poor" was considered ≤ 79% ranges [13,14].

The practice of prevention: The expression for the practice of prevention items for COVID-19 respondents considered as "good" was scored ranges 80%-100%, and "poor "was scored ranges considered ≤ 79% ranges [13,14]. The prepared survey questionnaire was adopted from WHO (2020) survey tools for COVID-19 prevention practice [15,16], with the consolidation of different national survey findings [17-19].The prepared structured questionnaires' contained the category of "yes" labeled as "1" and "No" labeled as "0" with each item weighted one point.

Data collection procedure and quality control

Data regarding the socio-demographic, source of information for exposure risk, and prevention practicing for COVID-19 were collected through face-to-face interviews using a structured questionnaire adapted from different literature [17-19], and WHO (2020) Survey tools for COVID-19 prevention measures [15,16]. The tools were developed and validated by a multidisciplinary working group of infectious disease physicians, lecturers, and public health professionals, and environmental team members. Three BSc nurses and two laboratory technicians were collected the data were by supervising strictly by two public health officers.

Data processing and analysis

The data entry was performed using Epi-Data version 3.1 and then exported into STATA/R version 14 (SE) for analysis. The descriptive statics was presented by narration and tabulations. The internal consistency and reliability of the knowledge and practice questions were tested by the reliability test of Cronbach's alpha coefficients, and it is credible ranges i.e., 0.76.

RESULTS

Socio demographic characteristics

Of the overall sample required (N=4233), 4230 individuals were included in this study and giving an overall response rate of 99.8%. The mean (± SD) age of the respondent was 37.5 (± 18.5) years of age, and ranging from 18 years to 98 years. Likewise, more than half, 2,280 (53.90%) of the study participants were male, and two-thirds of them 2,833 (66.97%) were urban dwellers. The majority, 1,536 (36.31%) of the study participant had no formal educations. 1,106(26.15%) having diplomas and above certificates (Table 1).

Table 1: Socio-demographic characteristics of COVID-19 quarantined population in North West regions of Ethiopia 2020.

Variables	Categories	Frequency	Percent
Sex	Male	2280	54.56
	Female	1980	45.44
Age	15-30	467	11.04
	31-45	901	21.3
	46-60	965	22.81
	≥ 60	1,897	44.85
Resident	Urban	2833	66.4
	Rural	1,397	33.6
Religion	Orthodox	1158	27.81
	Muslim	1088	25.08
	Protestant	1061	25.08
	Catholic	923	21.5

Educational status	No formal educated	1 536	36.31
	Complete elementary educ.	975	23.03
	Complete junior	137	3.24
	Complete high school	362	8.56
	Complete preparatory	114	2.7
	Having diploma and above	1,106	26.15
Marital status	Married	1,907	45.01
	Unmarried	2,323	54.99
	Poorest(<1000 birr/month)	1,369	32.72
	Poorer(1001-3000 birr/month	703	16.62
Economic status	Middle(3002-5000 birr/month)	660	15.5
	Richer(5001-10000 birr/month)	624	14.75
	Richest(≥ 10,000 birr/month)	874	20.66
	From friends and family members	1,372	32.43
	From health institutions	1,681	39.74
Source of COVID-19 information's	From religious leader	609	14.4
	From community leaders	568	13.43
Social media used	Yes	2,148	50.79
	No	2,081	49.31
Functionality of TV in the house	Yes	2,793	66.05
	No	1,437	33.79
Functionality of radio in the house	Yes	2,639	62.39
	No	1,591	37.61
Do you have previous comorbidity	Yes	381	9.01
	No	3,849	90.99
Types of comorbidity	Asthmatics	72	18.9
	HIV/AIDS	68	17.86
	AURTI	155	40.68
	CHF	46	12.07
	Other	40	10.5
Result of COVID-19 seru m IgG antibody test	Positive for COVID-19 test	216	5.12
	Negative for COVID-19 test	4014	94.89

COVID-19 Sero-prevalence among quarantined individuals

The overall seroprevalence of COVID-19 for symptom suspected quarantined individuals was found 5.11: 95% CI (4.47-5.87). Of the total 4233, COVID-19 suspected and received SARS-CoV-2 IgG antibody tested, 216 individuals were positive for COVID-19 infections. The largest number of 137 cases out of 2522 (5.43%) COVID-19 diagnosed individuals were from the Assosa quarantine center, whereas the remaining 79 (4.62%) cases out of 1711 suspected individuals were from Pawe quarantine centers, respectively.

Knowledge of respondents towards COVID-19 preventions

Of all participants, 3,889(91.94%) agreed frequent hand washing by soap and water prevents the risk of COVID-19. Whereas, 3,987 (94.26%) quarantined individuals were wearing facemask during let out home prevent the risk of COVID-19. Generally, eighty-six

percent of the study participant had good knowledge of COVID-19 mode of transmission, clinical presentations, and knowledge on prevention measures (Table 2).

Table 2: Knowledge towardsCOVID-19 infections among the quarantined population in North West Ethiopia, 2020.

Dimension on COVID-19		Answer	Figure	%
General knowledge towards COVID-19	Children, infants, and elders needs special care of COVID-19	Yes	4,078	96.41
		No	152	3.59
	COVID-19 has no treatment but had vaccine	Yes	3,865	91.3
		No	365	8.63
	Confirmed COVID-19 cases isolated and treated for 14 days	Yes	3,640	86.05
		No	590	13.95
Knowledge on sign and symptom of COVID-19	Fever, cough, shortness of breath, headache, muscle pain diarrhea, sore throat are the main symptoms	Yes	4,025	95.15
		No	205	4.85
	Fever is the only symptoms COVID-19 cases	Yes	615	14.54
		No	3,615	85.46
Knowledge towards mode of transmission of COVID-19	Direct hugging and shaking	Yes	3,969	93.83
		No	261	6.17
	Going on crowded area	Yes	4,018	94.99
		No	212	5.01
	Direct contact of animals	No	365	8.63
		Yes	4,015	94.92
	Using public taxi, bus and trains	Yes	3,716	87.85
		No	514	12.15
	Small aerosol droplets	Yes	3,842	90.83
		No	388	9.17
	Suspected cases isolation	Yes	3,512	83.03
		No	718	16.97
Knowledge towards prevention mechanisms of COVID- 19	Frequent hand washing by soup and water	Yes	3,918	92.62
		No	312	7.38
	staying at home except basic need	Yes	3,425	80.97
		No	805	19.03
	Using of hand sanitizer for hand contact	Yes	4,028	95.22
		No	202	4.78
	Wearing face during coughing, and sneezing	Yes	3,993	94.4
		No	237	5.6
	Maintain 2-meter social distance	Yes	3,512	83.03
		No	718	16.97
Overall COVID-19 Knowledge	Good knowledge of COVID-19		3645	86.20%
	Poor knowledge of COVID-19		585	13.70%

Practice of prevention respondents towards COVID-19

Among the top practiced preventive behaviors implemented by quarantined individuals before quarantining, frequent hand washing, avoiding handshaking, and stopping going in crowded places were reported as follows as 3,772 (89.17%), 3,296(77.92%), and 3,204 (75.74%), respectively. The overall practice of prevention towards COVID-19 infection on symptoms suspected quarantined individuals were found 62.82%; 95%CI: 60.75-63.8) (Table 3).

Table 3: Practice of prevention towards COVID-19 infection among quarantined population in North West Ethiopia, 2020.

Practice of prevention towards COVID-19		Category	Figure	Percent
Prevention measure towards COVID-19 infection	Hand washing practice by soup and water	Yes	3,836	90.69
		No	394	9.31
	using face mask during travelling out	Yes	3,471	82.06
		No	759	17.94
	Avoiding all types of handshaking	Yes	3312	78.04
		No	939	22.2
	Staying at home except for basic needs	Yes	3,291	77.8
		No	759	17.94
	Avoiding going on crowded place	Yes	3,236	76.8
		No	994	23.5
	Maintaining 2-meter social distances	Yes	2,696	63.74
		No	1,534	36.26
Over all COVID-19 practice of prevention	Good practice of prevention		2,632	62.80%
	Poor practice of prevention		1598	37.18

DISCUSSION

This is among the first study done to determine COVID-19 seroprevalence, knowledge, and prevention mitigations on symptoms of suspected individuals. The overall seroprevalence was reported 5.11:95% CI (4.47-5.77). This study finding is higher than the finding in Dire Dawa 3.2% [20], Sweden 4.2%, Canada 1.8%, Germany 0.12% [21,22].This might be low utilization for mass media (radio' TV, mobiles, and internet) to disseminated COVID-19 preventive messages, in addition to high community myth and behavioral non-adherence for prevention message of COVID-19 in Ethiopia [8]. Likewise, the existence of fragile health sectors, favor undoubtedly the distribution of COVID-19 as compared to the sophisticated health system in western countries [7,21].However, the report of this study is lower than the study finding in Peru 70.0%, Mexico 27%, Brazil 12%, and the Philippines 94.0% [21,23,24]. This might be due to all those studies were population-based estimation, whereas our study is a survey among quarantined populations [25]. This report is nearly comparable with the online survey finding of Ethiopia 91.1% and china 89.1% [25,26].

Knowledge of quarantined individuals towards COVID-19

This study found that the respondent's knowledge about transmission, clinical sign, and prevention of COVID-19 infection was as 86.45%: 95%CI (85.2-87.12). The level of knowledge on COVID-19 on clinical sign and symptoms, transmission, and prevention measure was higher than found in Addis Zemen 33.9%, Addis Ababa 48%, Gonder city 51.04, Dessie city 51.4%, Kombolcha district 54.11%, Amararegions 70% report in Malaysia 70.3% [13,14,17,27-30]. This discrepancy might be attributed to the types of research participants, and the study period when the

survey was conducted. Nevertheless, this study report is lower than online survey finding in Ethiopia 91.2%, Dessie city 92.7%, and central Nepal population 91.8% [31-33]. The possible difference could be the due difference in socio-demographic characteristics of the level of education, residence types, and the economic status among the quarantined population.

Practice of prevention towards COVID-19

According to the report of this research, sixty-three percent of respondents had the good preventive practice of prevention for COVID-19 infection. This is higher than the finding on reported Gondar City residents 51.04%, 44.6% reported in Dessie city resident, Dessie health center 41.7%, FMOH reported 49%, systemic reviewing and meta-analysis in Ethiopia 52.83%, and Uganda 32% [6,27,28,32-35]. This finding is lower than reported in Guragie zone 76.2% and online survey finding in Ethiopia 76%. This might be due to the existence of high social cohesion and interdependency Ethiopia makes it difficult to implement practicing rules of COVID-19 infection prevention rules easily. The majority of the Ethiopian population has lived below this economic class this makes difficult to implement always for COVID-19 prevention measures by purchasing soaps, sanitizer and face masks.

CONCLUSION

Finally, the overall sero-prevalence of the quarantined population in North West regions is high as compared with previously reported. However, the majority of the quarantined population knows how to prevent themselves from the COVID-19 pandemic, but changing this prevention knowledge into the practice of tackling is great hiatus. Even though the respondents having good knowledge for COVID-19 exposed risk prevention but implementing mitigation prevention practice for COVID-19 infections lower as compared with their levels of knowledge.

LIMITATIONS

The main limitation of this study was the data involved only quarantined individuals while the difficulty of inferred result for the community.

DECLARATIONS

Ethics approval and consent to participate

The ethical clearance and data collection permission obtained from Benishengul Regional health bureau (Ethic Ref. No: BHSC/-984/16/12), and during the data collection period written consent was assured from individuals beyond addressing permission letters for data collection for two quarantine centers. All information collected from patients was kept confidential and names of patients were not included.

CONSENT FOR PUBLICATIONS

Consent of publication was taken from study participants and quarantine centers during data collection period.

AVAILABILITY OF DATA AND MATERIALS

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

COMPETING INTERESTS

The authors declared that there is no competing interest.

AUTHORS' CONTRIBUTIONS

FK has drafted original research, write, and organized the collected data

BK and TK participating in preparing manuscript and participate in software analysis

AFA also involved in data analysis, result writing, editing and writing the manuscript.

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