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Poor Sleep Quality and Associated Factors Among Individuals in COVID-19 Quarantine Center, Southern Ethiopia, 2020

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Abstract: Background: Covid -19 is continuing as world health emergency issue and quarantine centers are still serving suspected cases of the pandemic in different parts of the country. Being isolated from the community for a certain period of time due the pandemic disturbs the sleep physiology of an individual. Sleep is vital for preventing the occurrence of mental illness and susceptibility to infection. So, this study aimed to measure the magnitude and determinants of poor sleep quality among individuals in quarantine center of Dilla town, Southern Ethiopia, 2020.

Methods: This study was a quarantine based cross sectional study design conducted from Apr 10 - 30, 2020. Simple random sampling technique was employed to select the participants. Face-to-face interviewer-administered methods was used to collect the data from the participants. Pittsburgh Sleep Quality Index (PSQI-7) standard assessment tool was used to measure the poor sleep quality of each participant. Variables with p-value < 0.05 will be considered at multi-variable logistic regression analysis. Finally Adjusted odds ratio (AOR), with 95% Confidence interval was estimated and interpreted for significant predictors of the outcome variable.

Results: This study enrolled 203 participants with 100 % response rate. The average age of the participants was 35 years old and nearly half 112 (55%) of participants were females. Among all participants, 85 (41.8%) of them had poor sleep quality. Being married (AOR= 2.84, 95% CI: 1.23- 6.21), age 35+ (AOR= 8.16, 95% CI: 4.03-15.1) and > 15 KM residence distance from the quarantine center (AOR= 4.12, 95% CI: 2.35- 8.89) were positively associated with poor sleep quality.

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Conclusions: This study revealed that poor sleep quality was a major psychological problem identified among communities living in the quarantine center. The most affected groups were married, age 35+, and > 15 kilometer residence distance from the quarantine center. Therefore, Intervening sleep in the quarantine center is vital to enhance their mental and physical wellbeing.

Keyword – Sleep Quality, COVID -19, Quarantine Center, Dilla, Ethiopia

1. INTRODUCTION

Sleep is a natural physiological process used to maintain homeostasis of the human body as regular exercise and eating a balanced diet (1). It needs comfortable environment such as cool, quite, ventilated and hygienic environment. Disturbed sleep increase individuals risk for getting infection due to its physiologic impact on immune lymphocyte cells (2).

The spread of COVID-19 pandemic is not still controlled throughout the world. Currently, at a global level 184, 644, 577 confirmed cases, 3, 994, 990 deaths, and 168, 966 ,712 recovered, and, in Ethiopia, 276,435 confirmed COVID-19 cases, 261 , 025 recovered case, and 4,331 total death reports (3,4).

The virus is highly transmittable via respiratory droplets, body and surface contact, and the usual common symptoms were sweating, fever, and cough (5,6). Two weeks stay in the quarantine center for those suspected cases was a recommended duration of stay to bypass the average incubation time of the virus (7).

The virus attacks all humans irrespective of their race, education, religion, and income. Those with advanced age and co-morbid medical conditions showed poor outcome for the supportive treatment of the virus at the treatment center (8).

In low income countries, including Ethiopia, the transmission and vulnerability of virus is significant due to low Resource mobilization, intensified surveillance, and capacity building. Few quarantine centers are opened in different parts of the country for suspected cases to control the transmission and timely investigation (9–11).

During this pandemic period, 25.3% - 78 % of peoples were developed different forms psychological problems due to the physical, social, economic and cultural influence of the virus all over the world. The most affected groups were female gender, large family size, advanced age and highly educated. A community based study showed that 18.2% of communities had poor sleep quality and affected groups were those with low social capital, and health workers (12–16). Poor sleep is responsible for mental illness, such as anxiety, stress, suicide, and headache, and also increases the susceptibility of contracting the new infection (17,18).

Different forms of psychological intervention such as supportive, individual, and group therapy were recommended to decrease the psychological burden of the pandemic. Mental health services are vital for the confirmed and suspected case, family members, and the whole members of the community (19,20).

Despite this much importance of sleep for preventing the mental and physical negative consequence of the pandemic, there is a shortage of studies conducted in Sub -Sharan countries among those who were living in quarantine centers. So, this study intended to

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measure the magnitude and determinants of poor sleep quality among peoples living in the quarantine center.

2. METHODOLOGY

The study was conducted in the quarantine center located in Dilla university samara campus. Currently the center was serving for more than 430 suspected cases. The estimated population living in the town is 80, 892. The area was a cross border between the country and Kenya. This quarantine-based cross-sectional study design was employed from April – March 2020.

Study population

All communities lived in the quarantine center of this study area.

Sample population

All communities were included based on the eligibility criteria of the study.

Eligibility criteria

Inclusion Criteria

All suspected cases with age18 and above.

Exclusion criteria: Those with different forms of acute and chronic medical/ physical illnesses.

Sample Size determination

For the calculation of study sample size , the proportion of a previous study employed in china on the same pandemic, 18.2 % (21), and a single population proportion formula was used.

We use, p = 0.18%, q= 0.82 and z= reliability coefficient at 95% confidence interval (1.96)
n = mandatory sample size n= Z (α/2) 2 pq / d2, p= 0.18, q=1-p (1-0.18) = 0.82
= (1.96) (1.96) (0.18) (0.82) / (0.05) (0.05)
= 185
d= (margin of error) =0.05
Non-response rate (10%) =18
The complete sample size was, 185+ 18 = 203

Sampling technique and procedure

Simple random sampling was used to select the required number of participants from the study populations. The computer-based registration checklist was the sampling frame. The required number of samples was selected using computer generated method of selection.

3. METHODS AND MATERIALS

Data collection instruments

Pittsburgh Sleep Quality Index (PSQI-7) scale was used to assess the sleep quality of the participants. Each 7 item was scored out of 3. The scale was validated and used to measure sleep-related parameters. The score ≥ of 5/21 was said to poor sleep quality (22).

A twelve-item 12- item questioner was used to assessing the knowledge, attitude, and practice (KAP) of respondents regarding the current pandemic. It was a sixteen-item questioner (a twelve 12 item knowledge, two-item attitude, and two items practice) and scored 1 for "yes "and 0 for "no/I don't know" response. The score ≥8/16 labeled as good KAP, < 8/16 labeled as poor knowledge (23).

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Study variable

Dependent variables – Poor sleep quality

Predictor variables- Sex, Age, Marital Status, Educational Status, KAP about the corona virus, and residence distance from the quarantine center.

Clinical variables – Known chronic illness, current substance use.

Data collection measures

At the beginning of the procedure, a carefully designed questioner and training manual was prepared. Both supervisors and data collectors were trained about the value of privacy and confidentiality during data collection period. The data collectors were health professional and collected using Face-to-face interviewer-administered methods via keeping the appropriate safety protocol of covid-19 pandemic.

Data management

Epi-data 3.4 version and SPSS version 22.0 were used to enter and analyze the data of the study participants. The data was entered into the Epi-Data 3.4 software package and exported to the Statistical Package for Social Science version 22 (SPSS 22).

To describe the result, frequencies, percentages, and cross-tabulations were conducted. Variables that have p< 0.25 at 95% CI during a Bi-variate logistic regression analysis were exported to the final multivariable logistic regression. Variables with the odds ratio (OR) at p-value < 0.05, 95% CI were considered as the independent predictors of the outcomevariable.

4. RESULT

Socio demographic status

This study included 203 respondents with a 100 % response rate. Nearly two-thirds 128 (63%) of respondents were age < 35 years old. Out of all, 112(55%) of them were female. 113 (55.6%) of the participants were lived >15 KM residence distance from the quarantine center (Table 1).

Table 1.Socio-demographic characteristics of respondents (N = 203).

Variable	Category	Frequency(n=420)	Percentage (%)
Sex	Male	91	45%
	Female	112	55%
Age	≤ 35 year	128	63%
	>35 year	75	37%

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Marital status	Single	84	41.3 %
	Married	41	20%
	Divorced	30	15%
	Widowed	48	23.6%
Educational status	Primary	21	10.4%
	Secondary	58	28.5%
	More-than secondary	124	60.9%
Residence distance from the quarantine center	>15KM	113	55.6 %
	< 15 KM	90	44.3%
KAP about COVID-19	Poor	95	46.8%
	Good	108	53.2%
Current substance use	Yes	47	23%
	No	156	77%
Current medical illness	Yes	37	18%
	No	166	82%

KAP result of the respondents

Most of them reported to disagree with the item "Do you agree that the covid-19 will be finally controlled" and 60% of them strongly disagree with the items "In recent days, have you worn a mask when leaving home" (Table 2).

Table 2. Knowledge, Attitude and Practice of respondents about COVID-19 pandemic (N=203)

	Knowledge assessment tool	True	False (I Don't know)
1	The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia	132(65%)	71(35%)
2	Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.	77(38%)	126(62%)
3	Currently there is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection.	81(40%)	122(60%)
4	Not all persons with COVID-2019 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases.	75(37%)	128(63%)

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5	Eating or contacting wild animals would result in the infection by the COVID-19 virus.	59(29%)	144(71)
6	Persons with COVID-2019 cannot infect the virus to others when a fever is not present	55(36%)	148(73%)
7	The COVID-19 virus spreads via respiratory droplets of infected individuals	203(100%)	0(0%)
8	Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus	183(90%)	20(10%)
9	It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus	51(25%)	152(75%)
10	To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and Avoid taking public transportations.	203(100%)	0(0%)
11	Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	159(78.5%)	44(21.6%)
12	People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days	143(70.5%)	60(29.5%)
	Attitude	Agree	Disagree (I don't know)
13	Do you agree that COVID-19 will finally be successfully controlled?	73(36%)	130(64%)
14	Do you have confidence that Ethiopia can win the battle against the COVID-19 virus	72(35%)	131(65%)
	Practice	Yes	No
15	In recent days, have you gone to any crowded place? (Before quarantine to this place)	93(46%)	110(54%)
16	In recent days, have you worn a mask when leaving home? (Before quarantine to this place)	81(40%)	122(60%)

The magnitude of Sleep quality

Out of all respondents who participated in this study, 85 (41.8 %) of them scored > 5 was considered as a poor sleep quality (fig. 1).

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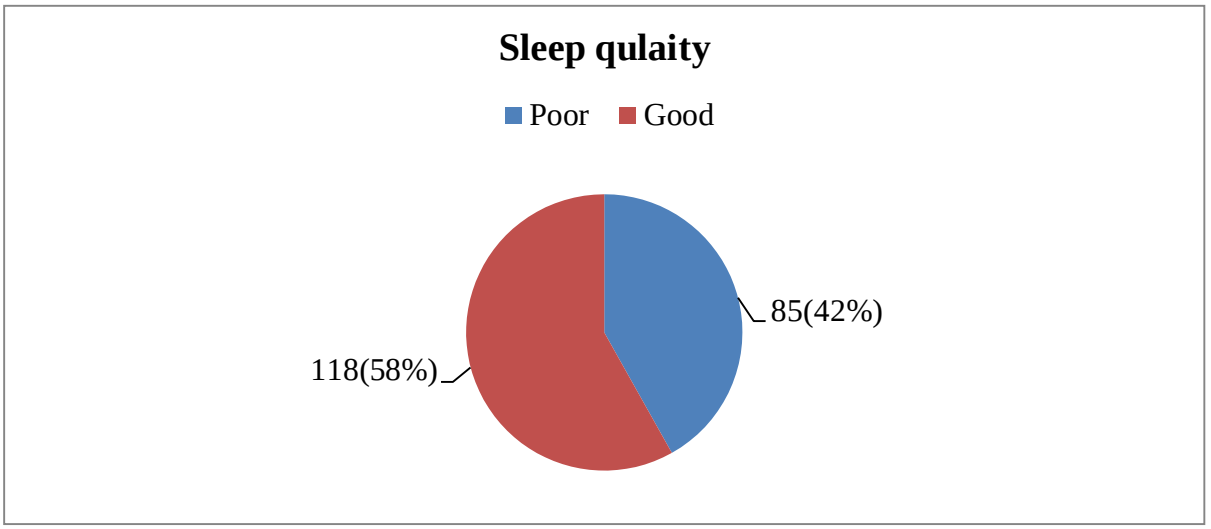

Fig.1. Sleep quality description of participants (N=203).

Factors associated with Sleep quality

During the multi-variable regression analysis at 95% CI, p<0.05, variables related with sleep quality were being married (AOR= 2.84 (1.23- 6.21), age 35+ (AOR= 8.16(4.03-15.1) and > 15 KM residence distance from the quarantine center (AOR= 4.12 (2.35- 8.89) (Table 3).

Table 3. Logistic regression analysis result of respondents (N=203).

Variables	Category	Sleep quality		COR(95% CI)	AOR(95% CI)
		Poor	Good		
Sex	Male	43(21.1%)	48(23.6%)	1	
	Female	55(27%)	57(28.0%)	1.08 (0.62 , 1.87)	
Age	Below 35	34(16.7%)	94(46.3%)	1	
	Above 35	57(28.0%)	18(8.8%)	8.75 (4.53 , 16.93)*	8.16(4.03-15.1)**
Marital status	Single	31(15.2%)	53(26.1%)	1	
	Married	26(12.8%)	15(7.3%)	2.96 (1.37 , 6.43) *	2.84(1.23-6.21)*
	Others *	23(11.3%)	55(27.0%)	0.71 (0.37 , 1.38)	
Educational status	Primary	13(6.4%)	8(3.9%)	1	
	Secondary	27(13.3%)	31(15.2%)	0.54(0.19 , 1.49)	
	Above secondary	74(36.4%)	50(24.6%)	0.91 (0.35 , 2.36)	
Residence	> 15KM	87(42.8%)	26(12.8%)	4.79 (2.61-	4.12(2.35- 8.89)**

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Distance from the quarantine center				8.79)**	
	<15KM	37(18.2%)	53(26.1%)	1	
KAP about COVID-19	Poor	65(32.0%)	30(14.7%)	1.04(0.58-1.88)	
	Good	73(35.9%)	35(17.2%)	1	
Current substance use	Yes	29(61.7%)	18(38.2%)	1.3114 (0.67-2.55)	
	No	86(55.1%)	70(44.9%)	1	
Current chronic medical illness	Yes	12(44.4%)	15(55.6%)	0.628(0.27-1.42)	
	No	93(56%)	73(46.7%)	1	

Others * -divorced, widowed and separated, KM-kilometer

5. DISCUSSION

This quarantine community-based study enrolled 203 participants to assess sleep quality problems as the result of being quarantined for two weeks period, which aimed to control the transmission virus from the suspected case to others. In this study, there was almost equal gender frequency distribution which, aids in measuring sleep quality irrespective of the natural gender difference. This study revealed that more than one-third of the respondents (41.8%) had poor sleep quality, and the predictors were being married, age 35+, and less than 15 KM residence distance from the quarantine center.

According to this study, there was 41.8 % sleep quality problem and higher than the study done

in China (18.2 %) (25). The possible reason for the noted difference might be due to the discrepancy in literacy, study participant: quarantine center communities, which potentially stress a full and new environment affecting the sleep pattern of humans.

More than half (53.2%) of respondents had good knowledge about the coronavirus, and lower than Malaysian study (77.2%) (24). It might be due to the variance in the accessibility of information and poor practice of attending government social media. Moreover, it might be due to the quarantine communities' willingness, concern, and commitment to learning about the coronavirus.

This study finding was lower than Switzerland's study conducted among health care professionals (51.2%) (26). It might be due to the dissimilarity of participants, health care professionals, which might contribute to the distress related to their high day-to-day susceptibility for contracting the virus and no proven medication to be taken after being positive for the virus.

This study found that those respondents who were married had 2.84 times (1.23-6.21) more likely to experience poor sleep quality, and inconsistent with a community study done in Ethiopia (27). It might be due to their reciprocal partner's worry about the pandemic inside and outside the quarantine center, which contributes to sleep disturbance. Besides, those who

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married might have children at home, which enhances their worry of being ill and its impact on the psychosocial wellbeing of the whole family.
This study found that those respondents Age > 35 years had 8.16 times (4.03-15.1) more vulnerable to experience poor quality sleep as compared with Age less than < 35 years of old and in agreement with the study done in Spain (28). It might be explained by the world health organization's first-time information on the high susceptibility of older age to contracting the virus, which results in fear, anxiety, stress, and disturbed sleep patterns. Moreover, those with age >35 might have a chronic illness and poor immunity status, which increases their susceptibility for the infection and poor outcome and results in a psychological problem such as sleep disturbance.
According to this study result respondents with >15 kilometer residence distance from the quarantine center had 4.12 (2.35- 8.89) times more likely to experience poor quality of sleep, and similar with the study done in Switzerland (29) . It might be due to the difference in close family contact, family visit and social support in handling the different psychological, social, economic crises related to the pandemic.

6. CONCLUSION

This study found as most of the respondents were experienced poor sleep quality in the quarantine center. The predictors of the outcome variable were being married, age 35+, and > 15 kilometer residence distance from the quarantine center.
There should be a short time psychological readiness training during the initial time of entry to the quarantine center about the possible sleep problems. It is better to have a sleep hygiene intervention for those who were married, age > 35+, and > 15 kilometer residence distance from the quarantine center.
Ethiopian ministry of health should prepare a very relaxing environment for the quarantine center to reduce the psychological impact of being in a quarantine place. Finally, it is better if a qualitative study is done on those communities to identify the potential contributing factors affecting the psychological wellbeing of humans.

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Ethical declarations
Conflict of interest
The authors declared that there is no conflicts of interest.
Ethical approval
The permission letter was obtained from the corona service coordinator case team.
Informed consent
Oral and written informed consent was obtained from all the respondents.
List of abbreviations
AOR- Adjusted Odds Ratio

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CI - Confidence Interval
COR – Crude Odd Ratio
COVID-19 - Consider Coronavirus Disease 2019
KAP- Knowledge, Awareness, and Practice
KM-kilometer PSQI – Pits Burgh Sleep Quality Index

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