Insomnia Among Patients with Chronic Medical Illness During COVID-19 Pandemic: Association with Sociodemographic Variables and Social Support

Aman Dule[1], Zakir Abdu[1], Mohammedamin Hajure[1], Mustefa Mohammedhussein[2], Mandaras Tariku[3]

[1]Department of Psychiatry, Collage of Health Sciences, Mettu University, Mettu, Ethiopia

[2]Psychiatry Department, School of Health Science, Madda Walabu University, Goba, Ethiopia

[3]Department of Psychiatry, Collage of Health and Medical Sciences, Haramaya University, Harar, Ethiopia

Email address:
amandule1993@gmail.com (A. Dule), zakirabdu45@gmail.com (Z. Abdu), sikoado340@gmail.com (M. Hajure),
mustefamohammed1984@gmail.com (M. Mohammedhussein), mulatamedin@gmil.com (M. Tariku)

Abstract: *Introduction*: The altered circadian rhythm from home confinement during COVID-19 pandemic has resulted to mental disturbances and interference of sleep specifically among vulnerable groups. The present study was aimed to evaluate the impacts of the pandemic on the sleep status of peoples living with chronic medical diseases. *Methods*: A cross-sectional study was undertaken at southwest Ethiopia from June 1 to July 30, 2020 among 411 patients with chronic medical conditions. Descriptive statistics such as frequency table, percentage and chi-square test were used. Binary and multivariate logistic regressions were conducted and p-value of<0.05 was considered significant. *Results*: The mean age of the participants was 43.6±13.34 years and 32.6% (95% CI: 28.5, 37.2) of participants had reported insomnia. Age, marital status and educational levels had significant relations with insomnia on chi-square test. After controlling for potential confounders, poor social support (AOR=2.32, 95% CI=1.27, 4.23), greater than 6 years duration of illness (AOR=3.18, 95% CI=1.92, 5.27), presence of depression (AOR=1.74, 95% CI=1.09, 2.75) and alcohol use (AOR=1.89, 95% CI=1.19, 3.00) had greater odds for insomnia when compared to their counters. *Conclusions*: From this study, substantial proportion of insomnia was found to be evident among peoples living with chronic medical condition amidst COVID-19 pandemic and poor social support, longer duration of illness, presence of depression and alcohol use were contributing factors. Generally, there was a significant increase in insomnia after the emergence of COVID-19 pandemic among this population and appropriate education on the regular basis on the benefits of sleep behaviour has paramount importance.

Keywords: Social Support, ISI, Corona Virus, Insomnia, Ethiopia

1. Introduction

Since its occurrence, corona virus disease 2019 (COVID-19) pandemic has introduced multiple burdens and psychological disturbances [1, 2]. The altered circadian rhythm and routine activities as a result of home confinement has given way to disturbed sleep and reduced quality of sleep [3, 4]. Unexpected occurrence of stress from outbreak, fears about illness and financial instability are causing psychosocial dysregulation and ongoing sleep disturbances [4, 5].

To restore physical functioning and psychological stability, retaining good sleep is crucial at the time of stressful condition [6]. Better sleep is pivotal issue to maintain mental health support physical wellbeing [7]. Sleep disturbances like non-restorative sleep, early awakening and insomnia were common complaints identified during this pandemic [8]. Sleep problems are linked to mental disturbances like stress and depression [9] and many factors can contribute to sleep difficulties [10].

For instance, one previous study during COVID-19 pandemic has revealed high sleep disturbances (67.1%) which were associated with family number and female gender [11]. The study conducted in China also supportive to this finding and 66.1% of health care professionals had identified as poor sleepers and this linked to age above 35 years old and mental health disturbances [12].

Another finding has indicated as sleep disturbances during pandemic outbreak were about 18.2% among general population and occupation and age were associated to poor sleep [13]. As the study from Italy revealed, almost all sleep quality components have been troubled and sleep quality has decreased [14].

Apart from socio-demographic factors, good social support has related with improved subjective sleep [15] and better family support has also improved sleep duration while decreases night-time awakening [16]. The other supportive findings had reported from previous studies in which people with good social support had reported lower poor sleep quality, decreased sleep difficulties disturbances [17–19]. In similar manner, it had reported that high social support has linked to lesser actigraphy record and good sleep quality [7, 20].

Although the current pandemic has imposed disruptions on sleep variables so far, this is the first study in evaluating the status of sleep among people with chronic medical conditions at national level as far as we know. Consequently, the current study was intended to measure insomnia and its correlation with social support and socio-demographic characteristics of the study respondents.

2. Materials and Methods

2.1. Study Setting and Design

A cross-sectional survey was undertaken among 411 people with chronic medical conditions on follow-up treatment at Mettu Karl Referral Hospital, southwest Ethiopia from June 1 - July 30, 2020. Individual patients who were 18 years old and above were involved in the study and those with acute exacerbation of the illness were excluded.

2.2. Sample Size Calculation and Procedures

A minimum sample size was achieved by using single population proportion formula by assuming 50% of proportion, 95% confidence level, 5% of margin of error and 10% of non-response rate. Respondents were included consecutively until the achievement of intended sample number.

2.3. Instruments and Data Collection Procedures

The questionnaires containing socio-demographic characteristics, clinical factors, insomnia severity scale and social support scale were administered by interviewer. For the consistency of the questionnaires, original English version of the questions were translated to Afan Oromo and Amharic (a local languages) and then back to English by experts.

Insomnia was measured using insomnia Severity Index (ISI) which assesses the status of insomnia in the last two weeks. The instrument has 7 items which scored on Likert scale of 0 to 4 and yields summation of 0-28 and patient with a minimum of 8 point is considered as subthreshold insomnia [21]. This tool was validated among Ethiopian adults and has good psychometric properties [22].

To measure social support, Oslo-3 social support was employed. The scale has the score ranged from 3 to 14 in which 3-8, 9-11 and 12-14 scores reveal poor, moderate and strong support respectively [23].

2.4. Statistical Analyses

Analysis was employed using SPSS version 20.0 (IBM, Armonk, NY, USA). Descriptive statistics such as frequency table and chi-square were used. Binary and multivariable logistic regressions were conducted and variables with a p-value ≤0.20 on bivariable analysis were transferred the final regression model. For strength of association, odds ratio and a 95% confidence interval were considered; while statistical significance was considered at a p-value<0.05. Moreover, methodological details of this study were mentioned elsewhere since the study was the part of earlier published project [24].

2.5. Ethical Approval and Informed Consent

All participants had signed written consent and all information was reserved confidential. Ethical clearance was given from the ethical review committee of College of Health, Mettu University and the study was undertaken in accordance with the Declaration Helsinki.

2.6. Data Availability

On reasonable request, the data supporting the results are obtainable with corresponding author.

3. Results

3.1. Socio-demographic Characteristics Study Participants

Overall, 411 individuals living with chronic medical diseases were involved in the study of which more than half (52.8%) of them were males and the remaining were females. The mean age of the respondents was 43.6±13.34 years and most (56.2%) of the study subjects have attended their primarily education (Table 1).

Table 1. *Description of the socio-demographic characteristics of the patients with chronic medical illness during COVID-19 Pandemic (N=411).*

Variables	Category	Frequency	Percentage
Gender	Male	217	52.8
	Female	194	47.2
Age (Year)	18-24	58	14.1
	25-34	30	7.3
	35-44	103	25.1
	45-54	108	26.3
	>55	112	27.3
Age at onset of illness	<36	181	44.0
	≥37	230	56.0
Marital status	Single	101	24.6
	Separated	44	10.7
	Married	235	57.2
	Widowed/divorced	31	7.5
Occupation	Government worker	99	24.1
	Self-employed	126	30.7
	Unemployed	186	45.3
Educational status	No formal education	31	7.5
	Primarily (1-8)	231	56.2
	Secondary and above	149	36.3
Residence in the past 2 weeks	Urban	241	58.6
	Rural	170	41.1
Family size	1-3	235	57.2
	4 and above	176	42.8

3.2. Status of Insomnia and Social Support Among Study Participants

As measured by ISI, 134 (32.6% [(95% CI: 28.5, 37.2)]) patients had reported insomnia at cutoff point≥8. Considering severity, about 28.5% (n=117) and 4.1% (n=17) of participants had moderate and severe insomnia respectively.

Among total participants, about one-fourth (25.5%) of them had poor support; while 40.6% and 33.8% of patients had reported moderate and strong social support respectively as examined using Oslo-3 social support scale.

3.3. Association of Insomnia with Socio-demographic Characteristics and Clinical Correlates

In this study, different factors thought to have significant relationship with outcome variables were included. Accordingly, age, marital status and educational status had significant associations with insomnia on chi-square test (Table 2).

Table 2. *Chi-square test for association of insomnia with socio-demographic characteristics of the patients with chronic medical illness during COVID-19 Pandemic (N=411).*

Variables	Category	Insomnia		X^2	p-value
		Yes (n=134)	No (n=277)		
		N (%)	N (%)		
Gender	Male	142 (65.4)	75 (34.6)	0.044	0.370
	Female	135 (69.6)	59 (30.4)		
Age (Year)	18-24	19 (32.8)	39 (67.2)		
	25-34	5 (16.7)	25 (83.3)		
	35-44	30 (29.1)	73 (70.9)	0.155	0.043
	45-54	32 (29.6)	76 (70.4)		
	>55	48 (42.9)	64 (57.1)		
Age at onset of illness	<36	121 (66.9)	60 (33.1)	0.010	0.830
	≥37	156 (67.8)	74 (32.2)		
Marital status	Single	66 (65.3)	35 (34.7)		
	Separated	38 (86.4)	6 (13.6)	0.154	0.021
	Married	156 (66.4)	79 (33.6)		
	Widowed/divorced	17 (54.8)	14 (45.2)		
Occupation	Government worker	68 (68.7)	31 (31.3)		
	Self-employed	89 (70.6)	37 (29.4)	0.058	0.052
	Unemployed	120 (64.5)	66 (35.5)		
Educational status	No formal education	22 (71.0)	9 (29.0)		
	Primarily (1-8)	141 (61.0)	90 (39.0)	0.156	0.007
	Secondary and above	114 (76.5)	35 (23.5)		
Residence in past 2 weeks	Urban	167 (69.3)	74 (30.7)	0.048	0.328
	Rural	110 (64.7)	60 (35.3)		

Variables	Category	Insomnia		X²	p-value
		Yes (n=134)	No (n=277)		
		N (%)	N (%)		
Family size	1-3	165 (70.2)	165 (70.2)	0.069	0.159
	4 and above	112 (63.6)	112 (63.6)		

Note: X² – Chi-square

Considering clinical factors, age at start of illness, khat use, presence of comorbidity, social support, illness duration, depression and alcohol use had shown significant association with insomnia on chi-square test (Table 3).

Table 3. *Chi-square test for social support and clinical factors among patients with chronic medical illness during COVID-19 Pandemic (N=411).*

Study variables	Categories	Insomnia		X²	P- value *
		Yes, 134 (32.6%)	No, 277 (67.4%)		
		N (%)	N (%)		
Duration of illness	<5	33 (19.6)	135 (80.4)	0.23	0.000
	≥6	101 (41.6)	142 (58.4)		
Alcohol use	No	59 (27.7)	154 (72.3)	0.109	0.028
	Yes	75 (37.9)	123 (62.1)		
Anxiety	Yes	80 (31.5)	174 (68.5)	0.030	0.542
	No	54 (34.4)	103 (65.6)		
Depression	Yes	56 (24.5)	173 (75.5)	0.195	0.000
	No	78 (42.9)	104 (57.1)		
Age at onset of illness	<36	44 (26.7)	121 (73.3)	0.104	0.035
	≥37	90 (36.6)	156 (63.4)		
Social support	Poor	43 (41.0)	62 (59.0)	0.136	0.022
	Moderate	56 (34.1)	108 (65.9)		
	Strong	35 (24.6)	107 (75.4)		
Presence of comorbidity	No	95 (29.9)	223 (70.1)	0.108	0.029
	Yes	39 (41.9)	54 (58.1)		
No of medication	1-2	120 (33.7)	236 (66.3)	0.060	0.224
	≥3	14 (25.5)	41 (74.5)		
Tobacco	No	111 (31.3)	244 (68.7)	0.072	0.146
	Yes	23 (41.1)	33 (58.9)		
Khat use	No	119 (35.8)	213 (64.2)	0.142	0.004
	Yes	15 (19.0)	64 (81.0)		
Physical activity	No	79 (31.6)	171 (68.4)	0.027	0.589
	Yes	55 (34.2)	106 (65.8)		

Note: X² – Chi-square
*P-value considered significant<0.05

After potential confounders have controlled, poor social support, longer duration of illness (>6years), depression and alcohol use has shown significant association with insomnia; while no socio-demographic variables have associated significantly in final model. Consequently, the odds of having insomnia among patients with poor social support was 2.3 times higher (AOR=2.32, 95% CI=1.27, 4.23) compared with those who had strong social support. In other ways, longer duration of illness [(>6 years) AOR=3.18, 95% CI=1.92, 5.27] and presence of depression [AOR=1.74, 95% CI=1.09, 2.75] were related with increased likelihoods of developing insomnia among patients study subjects. Finally, alcohol use was shown significant positive association with increased odds of insomnia [AOR=1.89, 95% CI=1.19, 3.00] among patients with chronic medical condition (Table 4).

Table 4. *Bivariable and multivariable logistic regression analysis for factors associated with insomnia among patients with chronic medical illness during COVID-19 Pandemic (N=411).*

Variables	Insomnia		AOR (95% CI)	P-value
	Yes (134)	No (277)		
	N (%)	N (%)		
Occupation				
Gov't worker	25 (26.9)	68 (73.1)	Ref	
Self employed	29 (24.6)	89 (75.4)	0.91 (0.46, 1.81)	0.790
Unemployed	80 (40.0)	120 (60.0)	1.64 (0.91, 2.95)	0.098
Age at start of illness				
<36	44 (26.7)	121 (73.3)	Ref	
≥37	90 (36.6)	156 (63.4)	1.50 (0.93, 2.42)	0.094
Social support				
Poor	43 (41.0)	62 (59.0)	2.32 (1.27, 4.23)	0.006**
Moderate	56 (34.1)	108 (65.9)	1.39 (0.80, 2.42)	0.231

Variables	Insomnia		AOR (95% CI)	P-value
	Yes (134)	No (277)		
	N (%)	N (%)		
Strong	35 (24.6)	107 (75.4)	Ref	
Duration of illness				
<5	33 (19.6)	135 (80.4)	Ref	
≥6	101 (41.6)	142 (58.4)	3.18 (1.92, 5.27)	<0.001*
Depression				
Yes	56 (24.5)	173 (75.5)	Ref	
No	78 (42.9)	104 (57.1)	1.74 (1.09, 2.75)	0.019*
Comorbidity				
No	95 (29.9)	223 (70.1)	Ref	
Yes	39 (41.9)	54 (58.1)	1.61 (0.96, 2.70)	0.070
Alcohol use				
No	59 (27.7)	154 (72.3)	Ref	
Yes	75 (37.9)	123 (62.1)	1.89 (1.19, 3.00)	0.007*

N. B: * p<0.05, * p<0.001 OR – Odds Ratio Gov't – Government

4. Discussion

The COVID-19 pandemic is continued with increased demand of health cares and has impacts on social aspects which could affect the world population at large. Disproportionately, it has negative impacts on patients living with chronic medical illness partly due to reduced services from decreased public transports, restricted travels to health facilities, insufficient health care workers and cancellations of planned treatments which may affect the normal sleep mechanism of the patients. This study was focused on insomnia during COVID-19 Pandemic and its association with socio-demographic characteristics, clinical factors and social support among individuals living with chronic medical illness in southwest Ethiopia. Hence, the prevalence of insomnia among individuals living with chronic medical illness during COVID-19 pandemic was 32.6% (95% CI: 28.5, 37.2). The result is in line with the different cross-sectional study done in China [25–27] and Greek [28]. The result was high as compared with earlier research finding reported from China [29]. The discrepancy might be explained by the finding of the current study done among individuals living with the chronic medical illness whereas; the previous study was on general population. The current finding also low as compared with another cross-sectional finding from China [25] which could be due to study participants and differences measurement tools.

The current results on associated factors with insomnia revealed that, poor social support, longer duration of illness (>6 years), depression, and current alcohol use were significantly associated with insomnia among individuals living with the chronic medical condition amidst COVID-19 in the study area. The odds of having insomnia among individuals who had poor social supports were 2.3 times higher as compared to those who had strong social support (AOR=2.32, 95% CI=1.27, 4.23). The result is in agreement with the previous research report from Brazil [30] and Stockholm [31].

The likelihoods of having insomnia among individuals living with chronic medical condition for longer duration (>6years) were 3.18 times higher compared with their counterparts (AOR=3.18, 95% CI=1.92, 5.27). This result is in line with study reported from USA [32]. The possible reason could be that, individuals living with chronic medical condition for longer duration may fear of the lethal outcome of COVID-19, the long term impacts of chronic medical condition on the patient's lifestyles, and the psychosocial problems of having a long term medical condition.

The odds of having insomnia among the study participants who had depressive symptoms were 1.74 times higher with those without depressive symptoms (AOR=1.74, 95% CI=1.09, 2.75). The finding may be due to the direct psychosocial impacts of COVID-19 among peoples with chronic medical condition, fear of getting COVID-19, and lethal effect of the virus among chronic medical patients. Additionally, individuals living with the chronic medical condition may have the severe physical symptoms that could be causes depressive symptoms and sleep disturbances [33, 34].

Finally, the study participants who had using alcohol for the past three months were 1.89 times insomnia as compared with those who were not used alcohol in the past three months (AOR=1.89, 95% CI=1.19, 3.00). Alcohol use among individuals living with the chronic medical illness has the direct adverse effect on the sleep patterns of the patients. Moreover, it is associated with the reduced rapid eye movement sleep and results in more sleep fragmentation and longer episodes of awakening [35, 36].

5. Limitations

Although this study was believed to provide baseline data and contribution to existing body of knowledge, we had identified some limitation. Firstly, we did not examine the adverse effects of the certain medications of the patients with specific illness which may affect sleep pattern. On the other hand, cross sectional survey cannot show causal relation in nature and longitudinal studies could be done in the future to elaborate the potential risk factors of insomnia individuals living with chronic medical condition.

6. Conclusions

The finding of the current study evident a significant proportion of insomnia among individuals living with chronic medical condition amidst COVID-19 pandemic. Longer duration of illness, poor social support, presence of depression and alcohol use had shown significant association with insomnia. Generally there is a significant increase of insomnia after the emergence of COVID-19 pandemic among patients with chronic medical condition. Provision of appropriate education on the regular basis on the benefits of sleep behaviour has paramount importance for the patients to keep their physical and psychological well-being amidst COVID-19 pandemic.

Conflict of Interest Statement

All the authors do not have any possible conflicts of interest.

Author Contributions

All authors had substantially contributed to study conceptualization, designing, data collection and analysis, drafting, critical reviewing and approving the last version to be published; and consented for submission to this journal and to be responsible for all aspects of the mentioned study.

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