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Assessing Sleep Quality among COVID-19 Positive Patients of Budhanilkantha Municipality, Nepal: A Cross-Sectional Descriptive Study

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ABSTRACT

Introduction: Since the first emergence of CoronaVirus Disease in2019 in Wuhan, China on December 31, 2019 there have been many long term impacts on health. Understanding factors associated with poor sleep quality among COVID-19 positive is important for development of intervention. This study aimed to assess Sleep Quality among COVID-19 positive patients of Budhanilkantha Municipality, Kathmandu.

Methods: A quantitative descriptive cross-sectional study was carried out. Patients who tested COVID-19 positive during the third COVID-19 wave (omicron) residing in Budhanilkantha Municipality were selected through the convenient sampling method. Sleep quality was measured using Pittsburgh Sleep Quality Index. Data was collected through the telephone interview technique and analyzed using SPSS version 16. Descriptive analysis was described in percentages and frequency distributions. A chi-square test was done for the bivariate data analysis.

Results: This study presents a high prevalence of poor sleep quality among COVID-19-positive patients which was 58.3% (95% CI: 50.4-65.8).

Conclusions: In conclusion, this study reveals a high prevalence of poor sleep quality among COVID-19 positive patients.

Keywords: COVID-19 lockdown;Pittsburgh sleep quality index; Sleep Quality.

INTRODUCTION

The first emergence of COVID-19 was noted in the city of Wuhan, China on December 31, 2019. [1] Quantity and quality are essential for sleep.[2] The quality of sleep ensures the fulfillment of essential physical, mental, and emotional benefits, serving critically in cognitive and hormonal functions. [3] COVID-19 patients might have a long-term impact on a survivor's sleep quality. COVID-19 survivors facing high discrimination reported poorer sleep quality. [4]

Though numerous research, vaccines and safety measures are continuously evolving, the world is still being hit by different waves of COVID-19. We all are in a dilemma about when COVID-19 is going to end or if we are going to live with it. [5] Determining the quality of sleep among COVID-19 positive patients is crucial.

Therefore, to assess the sleep quality among COVID-19 positive patients of Budhanilkantha Municipality, Kathmandu, this study was conducted and we hope that our study will aid in the implementation of effective public health policies and intervention concerning individual and collective psychological and mental health.

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METHODS

A quantitative descriptive cross-sectional study was carried out among (168 participants) males and females aged 18-87 years of Budhanilkantha Municipality, Kathmandu. Patients who tested COVID-19 positive during the third COVID-19 wave (omicron) from certified laboratories between (February 7-March 8, 2022) residing in Budhanilkantha Municipality, Kathmandu were selected through the convenient sampling method. Data collection request letter was prepared from OM Health Campus, and then submitted to the municipality office. Then, the list was obtained from the Health Department of the Municipality. Ethical clearance was obtained from the institutional review committee (Ref No: EPHIRC 205/2022).

Verbal consent was taken from each respondent. Those who were unwilling to participate were not included in the study. Confidentiality was maintained. Children under 18 were excluded from the study as formal consent is necessary from their parents or local guardian.

Sample size was calculated using the formula;

$n = z^2 p (1-p)/d^2$

$= (1.96)^2 \times 0.3036 \times 0.6964 / (0.08)^2$

$= 126.90$ now, rounding up

$n = 127$.

Where,

n= sample size,

Confidence Interval (CI) =95%, z=1.96

Proportion prevalence (p) =30.36%, =0.3036

q = (1-p) = (1-0.3036) = 0.6964

Allowable error (d) =8% = 0.08

Adding 10% of non-respondent, the sample is calculated to be n=140.

Participants were asked a semi-structured and self-administered questionnaire through telephone interviews for data collection. Sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI). PSQI is an effective instrument used to measure the quality and patterns of sleep over the last month.

The translated version of the PSQI questionnaire in Nepali used in this study has Cronbach's alpha of 0.75. PSQI score ranges from 0 to 21 a greater score suggests poor sleep quality. PSQI global score ranging less than 5 indicates a good sleeper whereas greater than or equal to 5 indicates a poor sleeper having a sensitivity of 89.6 percent and specificity of 86.5 percent, to determine the quality of sleep of COVID-19 positive patients. [6]

The collected data was stored digitally in the Kobo toolbox software. Data were entered and analyzed in SPSS version 16. Descriptive analysis was done and presented using percentages and frequency distributions. For the bivariate data analysis, the chi-square test was done, where $p \leq 0.05$ determines the associations between variables.

RESULTS

Out of n=168 participants, Table 1 reveals a high prevalence of poor sleep quality which is 58.3 percent (n=98) compared to good sleeper 41.7 percent (n=70) among COVID-19-positive patients. Though more patients (66.1 percent) said no changes in sleep habits before and after testing COVID-19 positive.

Table 1. Prevalence of sleep quality using the Pittsburgh Sleep Quality Index (n=168)

Variables	Frequency(n) %
Changed in sleep habits after testing COVID-19 positive	
Yes	57(33.9%)
No	111(66.1%)
Total PSQI score	
Good Sleeper	70 (41.7 %) *
Poor Sleeper	98 (58.3%) *

Among (n=168) respondents, age-group (28-37) years has the highest frequency, percentage i.e. 50 (29.8 percent) respectively. The mean age in years of the respondents was 41.23 (SD16.83). There were slightly more female respondents at 55.4 percent than male respondents at 44.6 percent. Most of the respondents i.e. 93 percent were literate and only 7.1 percent of respondents were illiterate. Brahmin/Chettri ethnic people have the highest participation 53% in study followed by 44% Janjati.

Most of the participants were involved in business and household activities. Considerably, the married percent was 66.7% while the majority (64.9%) of them lived in a nuclear family.

Table 2. Socio-demographic variables (n=168)

Variables	Frequency(n) %	Variables	Frequency(n) %
Age		**Ethnicity**	
18-27	39 (23.2%)	Dalit	3 (1.8%)
28-37	50 (29.8%)	Janjati	74 (44.0%)
38-47	24 (14.3%)	Madhesi	2 (1.2%)
48-57	20 (11.9%)	Brahmin/Chettri	89 (53.0%)
58-67	21 (12.5%)	**Occupational status**	
68-77	9 (5.4%)	Banker	13 (7.7%)
78-87	5 (3.0%)	Homemaker	23 (13.7%)
Mean	*41.23 (SD16.83)*	Business	22 (13.1%)
Sex		Health-profession	14 (8.3%)
Male	75 (44.6%)	Student	17 (10.1%)
Female	93 (55.4%)	Unemployed	25 (14.9%)
Religion		Government service	14 (8.3%)
Hindu	125 (74.4%)	Teacher	5 (3.0%)
Buddhist	29 (17.3%)	Foreign employment	14 (8.3%)
Christian	2 (1.2%)	Private organization	11 (6.5%)
Kirat	12 (7.1%)	Others	10 (6.0%)
Educational status		**Marital Status**	
Literate	27 (16.1%)	Married	112 (66.7%)
Illiterate	12 (7.1%)	Unmarried	48 (28.6%)
Primary Level	4 (2.4%)	Widowed/Widow	8 (4.8%)
SLC	10 (6.0%)	**Family Type**	
Higher Secondary	26 (15.5%)	Nuclear family	109 (64.9%)
Diploma	2 (1.2%)	Extended family	59 (35.1%)
Bachelor's Degree	50 (29.8%)		
Master's Degree	37 (22.0%)		

Bivariate Analysis

The majority of poor sleepers were found aged less than 35 years at 58.1 percent and female COVID-19 positive patients seem to have 62.4 percent significantly poor sleep quality than male patients 53.3 percent respectively. Based on educational status, the frequency of good sleeping was 4 among illiterate respondents so Fisher's exact test was done here resulting in a P-value of 0.76.

Table 3. Bivariate analysis of socio-demographic variables with sleep quality

Variables		Global PSQI Score		P-value
		Good Sleeper	Poor Sleeper	
Age	<35 years >=35 years	36 (41.9%) 34 (41.5%)	50 (58.1%) 48 (58.5%)	0.95
Sex	Male Female	35 (46.7%) 35 (37.6%)	40 (53.3%) 58 (62.4%)	0.23
Religion	Hindu Other than Hindu	54 (43.2%) 16 (37.2%)	71 (56.8%) 27 (62.8%)	0.49
Ethnicity	Brahmin/Chhetri Other than Brahmin/Chhetri	36 (40.4%) 34 (43.0%)	53 (59.6%) 45 (57.0%)	0.73
Education	Literate Illiterate	66 (42.3%) 4 (33.3%)	90 (57.7%) 8 (66.7%)	0.76 (Fisher's exact)
Occupation	Employed Unemployed	45 (43.7%) 25 (38.25%)	58 (56.3%) 40 (61.5%)	0.50
Marital status	Married / widow Unmarried	52 (43.3%) 18 (37.5%)	68 (56.7%) 30 (62.5%)	0.48
Family Type	Nuclear family Extended family	48 (44.0%) 22 (37.3%)	61 (56.03%) 37 (62.7%)	0.39

P value less than 0.05 significant

For the bivariate data analysis, the chi-square test was done, where p<=0.05 determines the associations between variables. Based on that, this table 4 shows a significant association between caffeine consumption and sleep quality with a P-value of 0.01, likewise, there is a strong association between physical activity and sleep quality with a P-value of 0.02

Table 4. Bivariate analysis of lifestyle and psychological variables with sleep quality

Variables		Global PSQI Score		P-value
		Good Sleeper	**Poor Sleeper**	
Alcohol consumption	Yes	31 (44.3%)	39 (55.7%)	0.56
	No	39 (39.8%)	59 (60.2%)	
Caffeine consumption	Yes	45 (36.3%)	79 (63.7%)	0.01**
	No	25 (56.8%)	19 (43.2%)	
Smoking	Yes	11 (37.9%)	18 (62.1%)	0.65
	No	59 (42.4%)	80 (57.6%)	
Physical activity	Yes	26 (32.5%)	54 (67.5%)	0.02**
	No	44 (50.0%)	44 (50.0%)	
Afraid of COVID-19	Yes	22 (36.7%)	38 (63.3%)	0.32
	No	48 (44.4%)	60 (55.6%)	
Anxiety /Stress	Yes	18 (35.3%)	33 (64.7%)	0.26
	No	52 (44.4%)	65 (55.6%)	
Worry	Yes	28 (37.8%)	46 (62.2%)	0.37
	No	42 (44.7%)	52 (55.3%)	
Loneliness	Yes	12 (44.4%)	15 (55.6%)	0.74
	No	58 (41.1%)	83 (58.9%)	

P value less than 0.05 significant

DISCUSSION

This is a quantitative descriptive cross-sectional study collecting data via telephone interview, the convenient sampling method. Among (n=168) respondents, age-group (28-37) years has the highest frequency percentage i.e. 50 (29.8 percent) respectively. The mean age in years of the respondents was 41.23 (SD16.83). There were slightly more female respondents at 55.4 percent than male respondents at 44.6 percent. Most of the respondents i.e. 93 percent were literate and only 7.1 percent of respondents were illiterate.

This study reveals a high prevalence of poor sleep quality which is 58.3 percent compared to good sleepers at 41.7 percent among COVID-19 positive patients. Similar results were found in a study conducted in China via telephone (n=199) interview. Terrible/poor sleep quality was reported at 10.1 percent and 26.1 percent reported worse sleep quality in the past week when comparing their current status versus the time before COVID-19. [4] A study conducted in Nepal assessing the quality of sleep before and after the COVID-19 pandemic shows a significant variation in sleep quality among Nepalese residents before and after the COVID-19 pandemic (t=3.2247) at P<0.001. [3]

Participants were asked to report on socio-demographic characteristics such as age, sex, religion, ethnicity, educational level, occupation, marital status, and the family type and it shows no association with sleep quality similar to the study conducted among hospitalized patients which shows no significance between sleep quality in terms of age, gender, marital status, and educational level. [7] A recent study recruiting 206 Nepalese residents measuring the Insomnia Severity Index showed that the prevalence of insomnia was more common among females i.e. 10.2 percent[3] similar to our study findings that 62.4 percent (n=58) of female poor sleepers compared to male participants (n=40, 53.3 percent).

This study shows a significant association between caffeine consumption and sleep quality with a P-value of 0.018, likewise, there is a strong association between physical activity and sleep quality with a P-value of 0.022. Compared to the study conducted in Wuhan, China reports the significant predictors between sleep quality and lifestyle before and during the COVID-19 lockdown. Poor sleep quality predicts the adoption of an unhealthy lifestyle during lockdown. [8]

The psychological characteristics were self-reported and participants n= 111 (66.1 percent) said no changes in sleep habits before and after testing COVID-19 positive while n=57 (33.9 percent) complained about changes in sleeping habits before and after testing COVID-19 positive. Similar to this study, 26.1 percent of the participants reported worse sleep quality and 72.9 percent reported no change when comparing their current status with that before SARs-COV2-infection.[4]

The percentage of self-reported psychological distress that was afraid of COVID-19 infection 35.7 percent (n=60), Suffered anxiety/ stress during isolation 30.4percent (n=51), Worried about testing COVID-19 positive 44 percent (n=74), and loneliness feeling during isolation 16.1percent (n=27). Another similar study resulted in more than one-fourth of the population suffering psychological problems, including anxiety and depression and about one-third had sleep disorders in response to the COVID-19 pandemic. [8]

Based on our study we concluded that there is a notable prevalence of Poor Sleep Quality among COVID-19 positive patients and consideration of increasing public awareness about sleep health and sleep-related disorders through promotive public-private and local partnerships is highly motivated.

The study has several limitations that should be acknowledged. Firstly, the data collection method relied on non-probability sampling, specifically convenience sampling. Secondly, the study was conducted with a relatively small sample size and focused on a small geographical region. Consequently, the results may not be representative of larger populations or different geographic areas, which limits the external validity of the study.

CONCLUSIONS

In conclusion, this study reveals a high prevalence of poor sleep quality among COVID-19-positive patients. Though more patients said no changes in sleep habits before and after testing COVID-19 positive. Using bivariate analysis between socio-demographic variables and sleep quality, the majority of poor sleepers were found aged less than 35 years and female COVID-19-positive respondents seem to have significantly poor sleep quality than male COVID-19-positive respondents. Bi-variate analysis of lifestyle and psychological characteristics with sleep quality shows a significant association between caffeine consumption and sleep quality similar to physical activity and sleep quality. There seems a lack of studies related to sleep quality, especially COVID-19 positive patients in Nepal. Therefore, more such studies should be carried out so that they could help in the development and implementation of effective public health policies and interventions concerning individual and collective

sleep, and psychological and mental health. Based on this study's findings, it shows a significant association between physical activity and sleep quality, so we should conduct further studies on checking if there exists an association between sleep quality and physical activity.

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