

Impact of Covid-19 Pandemic on Quality of Sleep Among Nepalese Residents

Avinash Chandra (✉ chandraavi@gmail.com)

KIST Medical College <https://orcid.org/0000-0002-3895-5369>

Pramila Karki

Vatsalya IVF Center

Pooja Prakash

Gandaki Medical College

Ayush Chandra

Tianjin Medical University

Sweta Khadka

Tribhuvan University

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Abstract

Background

A periodic state of rest accompanied by varying degree of unconsciousness and relative inactivity, the sleep is vital to human health, insufficiency of which can lead to serious problem with physical and mental health consequences. Because of COVID-19 Pandemic, Nepal is under a total lockdown, with total restrictions on the movement of individual in the entire nation, forcing people to home confinement. People are extremely worried about their and families' health as well as lost or verge of losing jobs. The daily news of increasing COVID-19 cases inside nation and all around the globe is adding to the fear that leads to anger, anxiety, frustration, and stress that directly affects the quality of sleep.

Objectives

The study aimed to assess the quality of sleep before and after COVID-19 pandemic among Nepalese residents.

Method:

A cross-sectional study was conducted that recruited 206 Nepalese residents. The participants completed an anonymous, self-administered questionnaires (SAQ). Insomnia Severity Index (ISI) questionnaire was used to measure the sleep quality before and after the COVID-19 pandemic. Analysis of gathered data was done by descriptive statistics and inferential statistics using SPSS-20 version statistical software.

Result

There was significant variation on sleep quality among Nepalese residents before and after COVID-19 pandemic ($t = 3.227$) at $p < 0.001$. Clinical moderate insomnia increased tremendously high in Nepalese. Before the onset of pandemic only 2.9% of participants had moderate and 1% had severe level of clinical insomnia that increased up to 16.5% and 1% after the pandemic, respectively. The mean ISI score was 6.35 ± 4.65 and 8.02 ± 6.01 before and after COVID-19 pandemic, respectively.

Conclusion

This is only one study being carried in Nepal so far that looks for the sleep quality during COVID-19 pandemic. These results show that the people are suffering tremendously with their sleep quality and calls for further research and active measures to help people have good sleep quality during the COVID-19 pandemic. Public awareness regarding the importance of good sleep quality to maintain their mental and physical health during the COVID-19 pandemic.

1. Introduction

Sleep (or at least a physiological period of quiescence) is a highly conserved behavior that occurs in animals ranging from fruit flies to humans.¹ So a result, a substantial fraction of humans' life is spent in this mysterious state. In the twentieth century, there was a revolution in understanding of the physiology of sleep, the importance of role of sleep and its quality influencing various other medical conditions. Sleep disruptions can be passing problem or sign of more serious underlying medical condition.² A periodic state of rest accompanied by varying degrees of unconsciousness and relative inactivity is referred as sleep, in another way is a state in which an individual lacks conscious awareness of environment surroundings, but can be easily aroused.^{2,3} Sleep is vital to human health and serves critically in neurobehavioral,⁴ cognitive^{5,6} and safety-related performance,⁷ memory consolidation,^{8,9} nociception¹⁰ as well appetite regulation,¹¹ immune¹² and hormonal functions.¹³

The American Academy of Sleep Medicine (AASM) and Sleep Research society released the recommended amount of sleep that it should be 7 or more hours per night on a regular basis to promote optimal health in adult. Sleeping less than 7 hours per night on a regular basis is associated with adverse health outcomes, where as sleeping more than 9-hours per night is associated with health risk.¹⁴⁻¹⁶ There is strong correlation between quality of sleep and indices like occupational activities, physical and psychological well being and even death.¹⁷ Feeling energetic and fit after sleeping is described as the quality sleep.¹⁸ Simply put together, sleep quality refers to how well you sleep. Panel of experts established the key indicators of good sleep quality and released by the National Sleep Foundation (NSF) actual sleeping time should be more (i.e.85%), falling asleep in less than 30 min, waking up no more than once per night and being awake for 20 minutes or less after initially falling asleep.¹⁵

Insufficient sleep is a serious problem with health consequences.² In a survey prevalence of insomnia in Indian population, it was found to be 9% while, 30% of population reported occasional insomnia.¹⁹ Insomnia is characterized by difficulty falling asleep, difficulty staying asleep, waking up too early or complaints of waking up feeling unrefreshed.² COVID-19 pandemic has gripped and halted the world. Nepal is a country between China (the epicenter of COVID-19) and India (a recent hotspot nation for COVID-19). The exponential rise in numbers of infected cases in Nepal has lingered the lockdown, so has increased joblessness, mental stress and so on and so forth. Survey on COVID-19 impact, lockdown that disrupted sleep patterns among 1,500 respondents in India reported that 67% respondents that worked from home had altered sleep schedule, 50% believed that their sleep pattern had disrupted, 81% felt their sleep schedule will get better after lockdown.²⁰ There are clear reciprocal dependencies between sleep duration, quality and the immune responses against viral,

bacterial, and parasitic pathogens, the latter altering in turn sleep patterns, the improved sleep quality and duration in the population may mitigate the propagation and severity of disease induced by SARS-Cov-2 infection.²¹

Although medical science has occupied the optimum level of success in the field of health a new challenge named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has emerged to face, was first identified in December 2019 in Wuhan City in central China.^{22,23} As of May12, 2020, World Health Organization has reported that Globally confirmed cases were 4,006,257 and deaths rate were 278,892 among them 88,891 new cases and 4531 deaths in last 24 hours and unfortunately, the number is only increasing. Similarly in Regions of the Americas: 1,702,451 confirmed cases and 10,1874 deaths rate, in Western Pacific Region: 160,910 confirmed and 6,493 death rate, Eastern Mediterranean Region: 265,164 confirmed and 9013 death rate, South East Asia Region: 100,881 confirmed and 3481 death rate, African Region: 44,533 confirmed and 1415 death rate has been reported till 12th May, 2020.²⁴ As per Ministry of Health and population of Nepal, more than 400 confirmed COVID-19 positive cases has been reported till 20th May, 2020 and it will rise up sharply.²⁵ The government of Nepal had announced nationwide total lockdown on March 24,2020 in a bid to stop the covid-19 from spreading out of control. The lockdown has totally clamped down the movement of people and shutdown of industries, schools and all other institutions except few.

Infectious disease epidemics not only affect the physical health of patients but also affect the psychological health and wellbeing of the non-infected population.²⁶ Previous studies have shown that the prevalence of novel infectious diseases, such as severe acute respiratory syndrome (SARS), can increase anxiety, depression, and stress levels in the general population, these negative emotions directly affect sleep.^{27,28} During the pandemic and lockdown period, reduced physical activity and disrupted routines of people are few among the main threats to sleep patterns amid the global outbreak.²⁹ Thinking about the COVID-19 crisis and watching news about the crisis, death of people causes stress among people, which is one of the primary causes of insomnia. Reducing TV time, increasing levels of physical activity and adhering to the same pre-lockdown work-hour routine and positive attitude towards life will improve the quality of sleep.²⁰

A survey on changes in sleep pattern, sense of time, and digital media use during COVID-19 lockdown in Italy stated that during home confinement sleep timing markedly changed, with people going to bed and waking up later, spending more time in bed but, paradoxically, also reporting a lower sleep quality. The increase in sleep difficulties was stronger for people with a higher level of depression, anxiety, and stress symptomatology, and was associated with the feeling of time dilatation.³⁰ A team of Chinese investigators found more than one-third of frontline health care workers responding to the coronavirus outbreak reported symptoms of insomnia. A survey on COVID-19 Health care workers and risk of insomnia presented that 36% people had symptoms of insomnia. Those patients with insomnia also reported higher levels of other health issues, for instance, 87.1% of patients with insomnia symptoms reported depression.³¹

Based on the previous research evidence, we have reason to speculate that the psychological condition as well sleep quality of the public may also be affected during COVID-19 outbreak in Nepal. Therefore, using a web-based cross-sectional study, we aimed to assess the impact of COVID-19 pandemic over the quality of sleep of Nepalese population. We hope that our study findings will provide data support for the targeted interventions on psychological and mental health in Nepalese public during the outbreak.

2. Methodology

2.1 Subjects

The study aimed to assess the quality of sleep before and after COVID-19 pandemic among Nepalese residents. This is an observational, cross-sectional study carried out from 20th April to 2nd May 2020. Subjects completed an anonymous, online survey, after reading the written consent form and explicitly agreeing to participate the survey. The survey was shared via social media with convenience sampling technique to select 260 Nepalese residents, out of which with a participation rate of 80% only 206 subjects included in study. Inclusion criteria was for those who were not using any medication that interferes with sleep, or any disease condition, had no history of alcohol, smoking usages, age 18 years or older and willing to participate in survey. The study protocol was approved by the ethics review committee. Exclusion criteria for the study were infected with COVID-19 or any other respiratory diseases, not available at the time of data collection. Insomnia severity index was used to measure the subjects' perception of sleep difficulty.

2.2 Measures

2.2.1 Study questionnaire

A self-structured questionnaire was developed based on literature review and Insomnia Severity Index (ISI). The questionnaire was adopted to gather socio-demographic variables as well to identify prevalence and severity sleep quality in the form of insomnia. Similar questionnaire was provided twice to same subjects to measure the quality of sleep before and after the COVID-19 pandemic. The first set of questionnaires would report for the sleep condition before COVID-19 pandemic and lockdown started and the second set of questionnaires was for the sleep condition after the COVID-19 pandemic was declared and lockdown started in Nepal. The participants rated the ISI depending on their own experience regarding sleep before (16th March) and after(24th March) the lockdown.

2.2.2 Insomnia Severity Index (ISI)

The ISI is a brief self-report instrument measuring the patient's perception of his or her insomnia. The ISI targets the subjective symptoms and consequences of insomnia as well as the degree of concerns or distress caused by those difficulties. Its content corresponds in part to the diagnostic criteria of insomnia.³² The ISI is composed of seven items that evaluate: (a) the severity of sleep-onset (initial), (b) sleep maintenance (middle), (c) early morning awakening (terminal) problems, (d) satisfaction with current sleep pattern, (e) interference with daily functioning, (f) noticeable to others/impairing the quality of life and

(g) level of distress caused by the sleep problem. Each item is scaled on a 5-point Likert scale from 0 to 4 to yield a total score ranging from 0 to 28. Interpretation of the results is as follows: absence of insomnia (0–7); subthreshold insomnia (8–14); moderate insomnia (15–21); and severe insomnia (22–28). Numerous studies proved that ISI is a valid and reliable instrument.³³ Internal consistency was established using Cronbach's alpha test. Cronbach's alpha value for ISI was 0.75.

2.2.3 Statistical Analysis

Analysis of gathered data was done by descriptive statistics and inferential statistics using SPSS-20 version. A descriptive analysis: frequency, percentage distribution, mean and standard deviation were used to describe the socio-demographic variables whereas an inferential analysis: paired t-test was used to assess the quality of sleep before and after COVID-19 pandemic among Nepalese residents, Karl-pearson's correlation coefficient was used to find the relation between socio-demographic variables and sleep quality after COVID-19 pandemic. The statistical significant level was set up at $p < 0.05$ (two sided).

3. Result

A total of 206 Nepalese residents were recruited among them 96 (46.6%) were female and 110 (53.4%) were male. The mean age of subjects was 29.5 ± 9.77 years. As per ISI, there was significant variation on sleep quality among Nepalese residents before and after pandemic. (Illustrated in Table1). More than half i.e. 130 (63.1%) subjects had clinically 'not significant insomnia' that decreased to 109 (52.9%) after the pandemic. Similarly, before the onset of pandemic one third i.e. 68 (33%) of subjects had subthreshold insomnia, 6 (2.9) had moderate and 2 (1%) had severe level of clinical insomnia that changed significantly during the pandemic period and subsequent lockdown. Only 61 (29.6%) were with subthreshold insomnia while the number of people with moderate insomnia increased to 34 (16.5) and there was no change in severe level of clinical insomnia that is 2 (1%). The mean ISI score was 6.35 ± 4.65 and 8.02 ± 6.01 before and after COVID-19 pandemic, respectively. Before the COVID-19 pandemic, difficulty on sleep onset was severe among 4.9% of subjects, sleep maintenance was severe among 2.9%, while awakening problem was very severe among 3.4%. 4.4% of participants were dissatisfied with their sleep quality. Among sleep difficulty impairing the quality of life, 2.9% had much noticeable, 4.4% of subjects were much worried about sleep problem and 6.8% had interference with daily functioning. After the pandemic 11.7% subjects had severe difficulty in falling asleep, 5.3% had difficult in sleep maintenance, 12.6% had severe awakening problem, 16 subjects were dissatisfied with their sleep pattern, 7.8% of subjects had impaired quality of life, 3.9% of subjects were very much worried about their sleep problem and 11.7% subjects daily living function was much interfered.

The table2 presented that there is significant difference in sleep quality before and after COVID-19 pandemic ($t=3.227$) at $p < 0.001$.

The current study showed that prevalence of insomnia was more common among females i.e. 10.2%, similarly less than 45 years old subjects had clinically severe insomnia. There was significant association of age with quality of sleep after COVID-19 pandemic ($\chi^2=19.91$) as well as satisfaction regarding sleep pattern ($\chi^2=0.685$), and interference with daily functioning at $p < 0.01$. There is negative relation of age with sleep quality before ($r=0.081$, $p=0.25$) and after ($r=0.065$, $p=0.36$) COVID-19 pandemic, that is statistically not significant. With regards to sex, there was negative relation with sleep quality after COVID-19 pandemic ($r=0.199$), which was statistically significant at $p < 0.001$. Table3 stated that there was significant positive relation between before and after covid-19 pandemic with regards to difficult in falling asleep ($r=0.164$, $p=0.018$), difficult in staying asleep ($r=0.208$, $p=0.003$) and impairing the quality of life ($r=0.194$, $p=0.005$). The study showed that there is significant difference in quality of sleep before and after COVID-19 pandemic with regards to difficult in falling asleep ($t=2.736$), difficult in staying asleep ($t=1.977$), satisfaction to current sleep ($t=3.03$) and worrying about sleep problem ($t=3.742$) at $p < 0.05$.

3. Discussion

The COVID-19 pandemic in 2020 is a paradigm of new emerging zoonotic disaster³⁴ It has exerted a great impact over medical, psychological, and social issues all over the world. This study used the ISI to determine the quality of sleep of Nepalese residents before the COVID-19 outbreaks comparative with after the COVID-19 pandemic. The current study showed that prevalence of insomnia was more common among females while less than 45 years old subjects had clinically severe insomnia. There was significant association of age with quality of sleep after COVID-19 pandemic as well with satisfaction regarding sleep pattern, and interference with daily functioning at $p < 0.01$. There was negative relation of sex with sleep quality, which was statistically significant ($p < 0.001$). Sleep quality and its correlation with general health in pre-university students of Karaj, Iran supports the finding as the study revealed regarding the sex differences, poor sleep quality in girls was significantly more than boys. The distribution between boys and girls was 33% and 52%, respectively, with significant difference ($p < 0.05$) in that study.³⁵ Our study stated that there was significant positive relation between before and after covid-19 pandemic with regards to difficult in falling asleep, difficult in staying asleep and impairing the quality of life. The study showed that there is significant difference in quality of sleep before and after COVID-19 pandemic with regards to difficult in falling asleep ($t=2.736$), difficult in staying asleep ($t=1.977$), satisfaction to current sleep ($t=3.03$) and worrying about sleep problem ($t=3.742$) at $p < 0.05$.

The present study showed that there is statistically significant depletion in the quality of sleep before and after COVID-19 pandemic ($t=3.227$) at $p < 0.001$. The mean ISI score was 6.35 ± 4.65 and 8.02 ± 6.01 before and after COVID-19 pandemic respectively. Similar study conducted in Italy aimed to investigate the changes in sleep pattern during COVID-19 lockdown supports the finding as the proportion of poor sleepers increased from 40.5% to 52.4% ($\chi^2=84.50$, $p < 0.0001$).³⁰ A cross-sectional study purposed to determine the effects of social capital on sleep quality and the mechanisms involved in individual self-isolation during the COVID-19 virus epidemic in central China, low level of social capital were associated with increased levels of anxiety and stress and the combination of anxiety and stress reduced the positive effects of social capital on sleep quality.²⁶ Another study on influence of coronavirus disease in sleep quality in China, results demonstrated that participants with Wuhan exposure history generally showed more latency onset of sleep ($\chi^2=9.77$, $p < 0.05$), it confirmed that subjective sleep quality, delayed sleep onset, sleep fragment and sleep duration all regulated the effect of Wuhan exposure history on Post traumatic stress disorder. The study suggested that sleep quality level decreased and posttraumatic stress symptoms increased with time.³⁶ Another study supported present study as the study aimed to assess sleep quality of medical staff treating patient with coronavirus disease 2019, stated that the

combination of anxiety, stress and self-efficacy of medical staff act on and resulted poor sleep quality.³⁷ Previous study aimed to assess the mental health burden of Chinese public during the outbreak, and to explore the potential influence factors, stated that 18.2% of public had poor sleep quality, healthcare workers (23.6%) were more likely to have poor sleep quality reported the highest rate of poor sleep quality ($P < 0.001$).³⁸ Our study also indicate that the sleep pattern changes was evident after the country went into a complete lockdown.

Present study demonstrated that 29.6% of subjects had subthreshold insomnia, 16.5% had moderate and 1% had severe level of clinical insomnia after the COVID-19 pandemic. After the COVID-19 pandemic 11.7% subjects had severe difficulty in falling asleep, 5.3% had difficult in sleep maintenance, 12.6% had severe awakening problem, 7.8% subjects were dissatisfied with their sleep pattern, 7.8% of subjects had impaired quality of life, 3.9% of subjects were very much worried about their sleep problem and 11.7% subjects daily living function was much interfered. A survey on COVID impact, lockdown that disrupted sleep patterns in India reported that 67% respondents that worked from home had altered sleep schedule, 50% believed that their sleep pattern had disrupted, 81% felt their sleep schedule will get better after lockdown. Before lockdown only 25% respondents had bedtime at post mid-night that increased to 35% after the lockdown, while 25% subjects used to get less than 6 hours of sleep before lockdown that increased 36% since the lockdown began.²⁰

Thus, our study points out the fact that the stress in form of COVID-19 pandemic and lockdown has been significantly affecting the quality of life of Nepalese citizen. Nepal being an economically lower nation, the lockdown has played a greater role in joblessness and lower income resulting into various health issues, most prominently seen in sleep pattern changes. The findings from this study demands and may provide supports for the implementation of measures to improve the sleep quality and to reduce the impact of COVID-19 pandemic over sleep quality among Nepalese residents. We recognize some limitations in this study as the study completed with small size 206, and the self-reporting questionnaire without having an instructor due to lack of direct contact with people during lockdown. The further studies should include the associated factors regarding insomnia and its contributing factors.

4. Conclusion

In conclusion, our study reveals a high prevalence of poor sleep quality among Nepalese residents. The ISI is an eye opener for the mostly ignored fact of sleep pattern. It showed that quality of sleep has significantly decreased in before and after COVID-19 pandemic among Nepalese residents. Public awareness should be created through the proper health education about the importance of good sleep quality to maintain their mental and psychological health during COVID-19 pandemic and lockdown.

Abbreviations

Insomnia Severity Index

ISI

Self-Administered Questionnaire

SAQ

Coronavirus Disease 2019

COVID-19

Severe Acute Respiratory Syndrome Coronavirus 2

SARS-CoV-2

Declarations

Ethics approval and consent to participate

The study was conducted after proper approval obtained from the ethics review committee and Institution Review Board of NHRC. The participants were well informed about the study and consent taken appropriately.

Consent to publication

All participant and coauthors have given consent for the publication of data and the required information.

Availability of data and material

Data supporting can be obtained from the table provided in the study and further can be obtained upon requirement/or request to the corresponding author.

Competing Interest

The authors declare that there is no competing interest.

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Author's contributions

All the authors have made substantial contribution to this paper.

PK and PP contributed to the conceptualization and drafting of the article. AC and SK contributed to the study design. AC contributed to the statistical analysis

and critical revision of the article.

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Tables

Table 1: Frequency and percentage distribution of Socio-demographic variables and Insomnia Severity Index

| Insomnia Problem | Frequency (percentages %) | | | | | | | | | |
|---|---------------------------------|--------------|-----------------|---------------|--------------------|--------------------------------|--------------|-----------------|---------------|--------------------|
| Sex | | | | | | | | | | |
| Female | 96 (46.6) | | | | | | | | | |
| Male | 110 (53.4) | | | | | | | | | |
| Mean±SD | 1.53±0.5 | | | | | | | | | |
| Age | | | | | | | | | | |
| 16-30 years | 142(68.9) | | | | | | | | | |
| 31-45 years | 48(23.3) | | | | | | | | | |
| 46-60 years | 12(5.8) | | | | | | | | | |
| >60 years | 4(1.9) | | | | | | | | | |
| Mean±SD | 29.5±9.77 | | | | | | | | | |
| | Before COVID-19 pandemic | | | | | After COVID-19 pandemic | | | | |
| | None | Mild | Moderate | Severe | Very Severe | None | Mild | Moderate | Severe | Very Severe |
| Difficulty falling asleep | 107 (51.9) | 53 (25.7) | 36 (17.5) | 10 (4.9) | - | 97 (47.1) | 44 (21.4) | 36 (17.5) | 24 (11.7) | 5 (2.4) |
| Difficulty staying asleep | 107 (51.9) | 60 (29.1) | 31 (15) | 6 (2.9) | 2 (1.0) | 94 (45.6) | 61 (29.6) | 36 (17.5) | 11(5.3) | 4 (1.9) |
| Awakening Problem | 86 (41.7) | 56 (27.2) | 42 (20.4) | 15 (7.3) | 7 (3.4) | 87 (42.2) | 41 (19.9) | 42 (20.4) | 26 (12.6) | 10 (4.9) |
| Satisfaction with current sleep pattern | 43 (20.9) | 95 (46.1) | 56 (27.2) | 9 (4.4) | 3 (1.5) | 38 (18.4) | 78 (37.9) | 49 (23.8) | 33 (16) | 8 (3.9) |
| Impairment of quality of life | 89 (43.2) | 70 (34) | 37 (18) | 6(2.9) | 4 (1.9) | 82 (39.8) | 62 (30.1) | 41 (19.9) | 16 (7.8) | 5 (2.4) |
| Worried about current sleep problem | 104 (50.5) | 64 (31.1) | 29 (14.1) | 9 (4.4) | - | 83 (40.3) | 59 (28.6) | 30 (14.6) | 26 (12.6) | 8 (3.9) |
| Interfere with daily functioning | 75 (36.4) | 64 (31.1) | 48 (23.3) | 14 (6.8) | 5 (2.4) | 66 (32) | 64 (31.1) | 43 (20.9) | 24 (11.7) | 9 (4.4) |
| Mean±SD | 6.35±4.649 | | | | | 8.01±6.010 | | | | |
| Insomnia Severity Index Score | | | | | | | | | | |
| Clinically not significant insomnia | 130(63.1) | | | | | 109(52.9) | | | | |
| Subthreshold Insomnia | 68(33) | | | | | 61(29.6) | | | | |
| Moderate clinical insomnia | 6(2.9) | | | | | 34(16.5) | | | | |
| Severe Clinical insomnia | 2(1.0) | | | | | 2(1.0) | | | | |
| Mean±SD | 0.42±0.601 | | | | | 0.66±0.786 | | | | |

Table2: Sleep quality before and after COVID-19 Pandemic

n=206

| Before and After COVID-19 pandemic | Mean±SD | 95% Confidence Interval of the Difference | | *t value | p value |
|---|-----------|---|-------|----------|---------|
| | | Lower | Upper | | |
| Difficulty falling asleep | 0.26±1.35 | 0.44 | 0.72 | 2.74* | 0.007 |
| Difficulty staying asleep | 0.17±1.19 | 0.33 | 0.00 | 1.98* | 0.049 |
| Awakening Problem | 0.15±1.57 | 0.36 | 0.70 | 1.33 | 0.184 |
| Satisfaction with current sleep pattern | 0.29±1.40 | 0.49 | 0.104 | 3.03* | 0.003 |
| Impairment of quality of life | 0.16±1.28 | 0.34 | 0.01 | 1.86 | 0.065 |
| Worried about current sleep problem | 0.39±1.50 | 0.59 | 0.18 | 3.74* | 0.00 |
| Interfere with daily functioning | 0.18±1.54 | 0.39 | 0.037 | 1.63 | 0.105 |
| Insomnia Severity Index Score | 1.66±7.4 | 0.65 | 0.65 | 3.227* | 0.001 |

*- significant at p<0.05

Table3: Association of Age, Sex and Insomnia Severity Index Score before and after COVID-19 pandemic

n=206

| | Age | | Sex | | | | | |
|---|---------|---------|-------------------------|---------|---------|---------|-------------------------|---------|
| | r value | p value | Chi square (χ^2) | p value | r value | p value | Chi square (χ^2) | p value |
| ISI score Before the COVID-19 Pandemic | -0.081 | 0.249 | | | -0.059 | 0.402 | | |
| ISI score After the COVID-19 Pandemic | -0.065 | 0.357 | 19.905* | 0.008 | -0.199* | 0.004 | 33.86 | 0.199 |
| Difficulty falling asleep | | | 1.56 | 0.59 | | | 6.689 | 0.152 |
| Difficulty staying asleep | | | 3.723 | 0.106 | | | 8.505 | 0.186 |
| Awakening Problem | | | 9.226 | 0.058 | | | 10.313 | 0.187 |
| Satisfaction with current sleep pattern | | | 0.685 | 0.11 | | | 7.157 | 0.80 |
| Impairment of quality of life | | | 5.698 | 0.058 | | | 3.435 | 0.112 |
| Worried about current sleep problem | | | 6.598 | 0.91 | | | 15.266 | 0.225 |
| Interfere with daily functioning | | | 10.74* | 0.026 | | | 11.084 | 0.159 |

r- Karl-pearson Coefficient correlation, *- significant at p<0.05