

## Original Research

# Impact of Insomnia on Optimism: A Predictor Factor among Young Adults in Indian Context

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## ABSTRACT

### Objective

This study examined the impact of insomnia and its psychosocial correlates among young adults in a University in Indian Context.

### Participants

Sample data were collected from 92 full-time university students (68.3 % females, mean age=19.33 SD=1.032 in Group 0 and in Group 1: 96.6% females, mean age=23.21 and SD=1.146).

### Methods

Participants completed a self-reported questionnaire that included the pittsburgh sleep quality index (PSQI), and optimism index (OI). A PSQI global score equal to or greater than 5 indicated insomnia.

### Results

There is a negative correlation between insomnia and PSQI and OI was found to be ( $r = -0.342, p < 0.01$ ) which means a higher level of optimism is related to better sleep quality and more sleeping difficulties relate to lower level of optimism.

### Conclusion

Optimism and sleep quality were both cause and effect of each other a bidirectional causal relationship.

### Keywords

Insomnia symptoms; Sleep duration; Optimism.

## INTRODUCTION

Emerging research supports the findings that nocturnal sleep is one of the most important aspects of our life for maintaining a sound physical and mental health.<sup>1</sup> Various research studies indicate that sleeping less than 7-hours as well as sleeping more than 8-hours is closely linked to an increased susceptibility to a broad range of physical and psychological health problems, such as ranging from poor vigilance and memory to reduced mental and physical reaction times, reduced motivation, depression, insomnia, metabolic abnormalities, obesity, immune impairment, and even a greater risk of coronary heart disease and even cancer.<sup>2</sup> Longitudinal evidence suggests that insomnia is the most common co-morbid condition seen with mood, anxiety and predates the onset of

low optimistic attitude within an individual.<sup>3</sup>

Numerous research studies also reveal significant results which indicate that sleep deprivation among young adults tends to interfere with the mechanism which is responsible for regulating personality characteristics including optimism, with increased risk for anxiety, negative mood, impulsivity, and inability to cope up with social stresses.<sup>4-8</sup> The circadian rhythm i.e. the sleep-wake cycle is controlled by the suprachiasmatic nucleus of hypothalamus.<sup>9</sup> The orexinergic neurons of the lateral hypothalamic area (LHA) promote wakefulness and the inhibitory effect of ventrolateral pre-optic nucleus (VLPO) promotes sleep.<sup>10</sup> There are various models which define the foundation of insomnia explaining the various factors that are responsible for related sleep disturbances. One

such model is the diathesis stress model or the 3-P model (predisposing, precipitating and perpetuating) factors given by Spielman et al<sup>11</sup> who mentioned the role of the three P's in development and maintenance of insomnia. The insomnia symptoms worsen in an attempt to relieve it hence the model focuses on behavioural pattern.<sup>11,12</sup> For example, an attempt to compensate for reduced sleep by spending increased time in bed may worsen insomnia unintentionally. As per the diagnostic guidelines of insomnia (ICD-10, 2004), the following are essential clinical features for a definite diagnosis.<sup>13</sup>

- The complaint is either of difficulty falling asleep or maintaining sleep or of poor quality of sleep.
- The sleep disturbance has occurred at least three times per week for at least 1-month.
- There is a preoccupation with the sleeplessness and excessive concern over its consequences at night and during the day.
- The unsatisfactory quantity and/or quality of sleep either causes marked distress or interferes with ordinary activities in daily living.
- The unsatisfactory quantity and/or quality of sleep is the patient only complains.

Compared to the research studies conducted on the consequences of poor sleep, there is inadequate evidence regarding the association between sleep duration with positive individual characteristics. According to the data published by National Sleep Foundation revealed that individuals who had an average sleeping duration of 7-8-hours reported to have better mental satisfaction with life compared to the other group of individuals who had a sleeping duration of less than 6-hours a night.<sup>14</sup> Fredrikson et al conducted another similar kind of study in which the results obtained were evidently indicating that longer the sleep duration higher is the self-esteem in adolescents.<sup>15</sup> Various other studies revealed a strong association between ample sleep duration and short sleep onset latency resulting in higher optimism in children.<sup>3</sup> Another experimental study was administered to examine the effect of insomnia and the results indicated that sleep deprivation leads to a gradual degradation of self-reported optimism and poor social interaction in young adults, which suggested that sleep duration is a determinant factor for the initiation of positive personality characteristics in an individual.<sup>16</sup>

Most of the research studies say that lack of sleep may lead to a comorbid condition which could be anxiety and depressive symptoms and also lack of optimism. In the present study, we, therefore, tested associations of sleep parameters with optimism among university students aged 17 to 26-years. In particular, the study was conducted to examine the relationship (RS) between symptoms of insomnia and optimism.

## METHODS

### Participants

A total of 92 subjects were selected using purposive sampling based on their encouragement to participate in the present study

from the university. The participants were divided into Group 0: 63 (aged 17-21-years) and Group 1: 29 (aged 22-26-years). Individuals who fulfilled the criteria of insomnia with the minimum age of 17-years were included in the study. On the other hand, individuals who were suffering from other psychiatric illness or comorbid conditions were excluded from the study based on structured psychiatric interview. All the subjects were explained in detail regarding the purpose of the study. Primarily, the mother tongue of all the participants was Hindi simultaneously had a good knowledge of English. Informed consent and personal information was taken from the participant and permission was granted by the research committee of the university to conduct the research (Table 1).

**Table 1. Sociodemographic Details and Clinical Characteristics of Participants (N=92)**

| Variable                             | Sample Size     | Age Group      |                 |
|--------------------------------------|-----------------|----------------|-----------------|
|                                      |                 | "17-21" (n=63) | "22-26" (n=29)  |
| Sociodemographic Characteristics     | 20.55 (2.098)   | 19.33(1.032)   | 23.21(1.146)    |
| Age in Years M(SD)                   | 15.83 (1.331)   | 15(0.00)       | 17.62(0.942)    |
| Years of Education M(SD)             |                 |                |                 |
| Gender n (%) Female                  | 71 (77.2)       | 43(68.3)       | 28(96.6)        |
| Clinical Characteristics             |                 |                |                 |
| Pittsburgh Sleep Quality Index M(SD) | 5.99 (3.437)    | 6.05(3.333)    | 5.86(3.710)     |
| Optimism Index                       | 223.49 (21.729) | 222.06(18.562) | 226.59(27.514). |

### Materials Used

Two standardised tools were administered for assessing Optimism and Sleep quality among the participants. Pittsburgh sleep quality index (PSQI) is an effective instrument which is used in the current study to measure the quality and patterns of sleep among the young adults in the two groups respectively. The PSQI has internal consistency and a reliability coefficient (Cronbach's alpha) of 0.83 for its seven components. It basically differentiates the quality of sleep from "poor" to "good" sleep by measuring seven core components which are as follows: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction; all the seven areas are self-rated by the participants. PSQI has been used extensively across a wide range of the clinical population. The original authors of this instrument have justified an acceptable internal consistency, test-retest reliability, sensitivity, and specificity in patients with sleep-disorder, depressed and healthy subjects.<sup>17</sup> Apart from the original article, there are various other studies which have evaluated the psychometric properties of the PSQI and disclosed an acceptable test-retest reliability,<sup>18</sup> construct validity,<sup>17</sup> criterion-related validity,<sup>18</sup> internal consistency,<sup>17</sup> across various clinical populations which includes patients with bone marrow transplant (n=155), patients with renal transplant (n=56), women detected with benign or associated symptoms of breast cancer (n=102),<sup>17</sup> and also in individuals with a concern of primary insomnia (n=80).<sup>18</sup> Scoring of the answers is based on a 4 point Likert Scale wherein the scale starts from 0 to 3, in which 3 reflects the negative extreme on the Likert Scale.<sup>17</sup> Optimism Index (OI) was used to measure the 05 dimensions of Optimism has internal consistency and a reliability

coefficient (Cronbach's alpha) of 0.80 for its five facets of Optimism (Positive Emotions (PE), Engagement (EM), Relationship, Meaningfulness (MF), Accomplishment (AC)). There were 60 items and the responses were encircled based on five options which consisted of: Strongly Disagree (SD), Disagree (D), Neutral (N), Strongly Agree (SA) and Agree (A).<sup>19</sup> Though OI has been used exclusively as a screening tool in Indian population to assess Optimism.<sup>20</sup> The original authors have established acceptable internal consistency, face validity and content validity for the test by retaining only those items which were relevant for the tool.<sup>21</sup> The data collected for the current study was analysed using SPSS (version 17, IBM Corporation, Bengaluru, India).

## RESULTS AND DISCUSSION

The aim of the study was to find out the RS between insomnia and five facets of Optimism among University students. On statistical analysis, the correlation (Table 2) between PSQI and OI was found to be: ( $r=-0.342, p<0.01$ ). Therefore, the findings reveal that there is a negative correlation between Sleeping Difficulties and Optimism which means a higher level of optimism is related to better Sleep Quality and more sleeping difficulties relate to lower level of optimism.

**Table 2.** Variation in Correlation between Optimism, its facet & Pittsburgh Sleep Quality Index with Group 0 and Group 1

| Variable                              | Correlation<br>n=92 | Correlation<br>Age Group |        | Significance<br>Tests (t-test) |         |
|---------------------------------------|---------------------|--------------------------|--------|--------------------------------|---------|
|                                       |                     | N=63                     | N=29   | t-test                         | p-value |
| Total (Optimism Index)                | -0.342              | -0.354                   | -0.342 | 0.949                          | 0.345   |
| Positive Emotions (PE)                | -0.304              | -0.338                   | -0.352 | 0.820                          | 0.414   |
| Engagement (EM)                       | -0.241              | -0.273                   | -0.194 | 0.656                          | 0.513   |
| Relationship (RS)                     | -0.289              | -0.251                   | -0.370 | 0.785                          | 0.435   |
| Meaningfulness (MF)                   | -0.258              | -0.196                   | -0.339 | 1.102                          | 0.273   |
| Accomplishment (AC)                   | -0.289              | -0.298                   | -0.242 | 0.465                          | 0.643   |
| Pittsburgh Sleep Quality Index (PSQI) |                     |                          |        | -1.169                         | 0.245   |

Further, the data analysed on optimism five facets-PE, EM, MF, RS and AC also provides negative correlation is found again between sleep difficulties using PSQI and each Optimism Facet using OI (Table 2). Extensive research study on optimism; which is a major aspect of positive personality is important as it is considered one of the core platform for the development of subjective well-being and health.<sup>19</sup> A prospective review study was conducted over a 9-year follow-up period which showed a protective effect of dispositional optimism against various cardiovascular mortality in old age controlling the initial health status.<sup>20</sup> The current study revealed a negative correlation between insomnia and optimism among university students. The detailed description is as follows:

**Positive Emotions and PSIQ:** On statistical analysis, the correlation between PE and the PSQI was found to be: ( $r=-0.304, p<0.01$ ). This indicates that there is a negative correlation between Sleep-

ing Difficulties & PE. This implies the inference that good quality sleep is related to a higher value of PE and *vice versa*.

**Engagement and PSIQ:** The RS between EM and Pittsburgh sleep QI is ( $r=-0.241, p<0.05$ ) which implies a negative correlation between Sleeping Difficulties and EM. A higher value of EM is seen in students with lower Pittsburgh sleep QI score as compared to those with higher Pittsburgh score. This implies the same inference as with above facet i.e. good quality sleep relates to good EM score and sleeping difficulties relate to low EM score/bad EM skills.

**Relationship and PSIQ:** The correlation value between RS and sleep quality Index: ( $r=-0.289, p<0.01$ ). A negative correlation value also indicates that this facet of optimism also relates to a higher value corresponding to lower values on the PSQI. This again confirms our inference that more sleeping difficulties are related to lower inter-personal RS skills. A good quality sleep is related to a higher level of RS values in students. There are similar supporting studies which show that people with lower social network and RSs tend to exhibit poor sleep. Researchers pointed out the importance of RS support on health which indicated that higher level of non-reciprocity in social interaction, the higher level of sleep problems, depression and lower level of physical and mental health.<sup>22</sup>

**Meaningfulness and PSIQ:** The fourth facet of optimism is MF which correlates as: ( $r=-0.258, p<0.05$ ) with the Pittsburgh score. This value also suggests that a good MF score is seen in students with good quality sleep as compared to those with sleep difficulties.<sup>23</sup> Haack and Mullington<sup>24</sup> demonstrated that sleep deprivation resulted in a gradual reduction of self-reported optimism and sociability in young adults, which suggests a causal relation between sleep and positive personality characteristics. There are rich literature studies conducted which show the RS between insomnia and physical health<sup>25</sup> wherein optimism on one side has a sleep-enhancing effect; whereas poor sleep constitutes pessimism on the other side.<sup>24,26</sup> Similarly, it's interesting to study that depressive mood fully moderates the first pathway, from optimism to sleep quality, the effects of sleep on optimism are only partially explained by depressive mood.<sup>27</sup>

**Accomplishment and PSIQ:** The last facet which is AC has a correlation value: ( $r=-0.289, p<0.01$ ) with the Pittsburgh score. This facet is also related to the PSQI similarly. sleeping difficulties relate to a lower value of AC and good quality sleep relates to a higher value of AC. Robert et al<sup>28</sup> stated that chronic insomnia is one of the leading cause that can result in poor performances in various aspects, including the interpersonal, somatic and psychological functioning of an individual.<sup>28</sup>

Further, an analysis was done to compare the variation in OI and Pittsburgh Score of participants with variation across the age Group (Table 1). The mean OI for Age Group 0 & Age Group 1 (Table 1) were found to be M(SD)=222.06(18.562) & M(SD)=226.59(27.514). These mean OI scores of the students of the two age groups were compared and the variation was found to

be just 2.04%, the mean OI increased by just 2.04% when moving from lower age group (Group 0) to higher age group (Group 1), which was considered as a marginal difference. This implies, in turn, reveals that Optimism level was comparatively better in Group 1: “22-26” age Group. Thus, this present study also suggests age doesn’t have a significant impact on the optimism level of university students.

The comparison was also done between the mean Pittsburgh scores of the two age groups. The Mean PSQI Scores for Age Group 0 and Age Group 1 found to be  $M(SD)=6.05(3.333)$  &  $M(SD)=5.86(3.710)$  which was a suggestive marginal/negligible difference. However, there are longitudinal studies conducted on adolescence which revealed that sleep duration decreased with age. Longer sleep duration was concurrently associated with better subjective psychological well-being<sup>29</sup> whereas; there were contraindicatory findings which showed that both the age groups had a variation of just 3.14% in Mean Pittsburgh Index Scores. The Mean PSQI shows a decrease of 3.14% from lower age group (Group 0) to a higher age group (Group1). This finding suggests that Sleep Quality was found marginally better in Group 1 i.e. “22-26” age group which indicates that age group variation among university students doesn’t significantly affect their sleep quality which can be related to limited sample size.

Despite the success to find out the bidirectional nature of insomnia on the five facets of optimism among young adults, there were certain limitations in the current study, which are as follows:

Small sample size and disproportionate gender distribution in the two groups limited the statistically significant result and further generalization of the outcome.

To overcome these shortcomings, further studies should be conducted on a larger sample size so that a causal linkage between the two variables- Insomnia and Optimism can be drawn with statistically significant value.

## CONCLUSION AND IMPLICATIONS

In summary, the current study extends the knowledge towards the facets of optimism, elaborating that better sleep quality is associated with a higher level of positive facets *viz.* PE, EM, RS, MF and AC. Future studies can make a greater effort in establishing a causal RS between optimism and insomnia and ascertaining the effect of multiple factors such as stress, depression, social support.

In a university setting, the finding can be implemented to nurture optimism and guide sleep hygiene promotion and intervention among college students.

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## DISCLOSURE

The authors hereby declare that the study was performed by self. Henceforth there is no involvement of the Research committee.

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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