Pilot study of Insomnia with Poor Sleep Quality in Indian subjects: Wake up call to an emerging public health issue

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Abstract

Background & objectives: Insomnia is a common disorder of the present times. However, insomnia in the context of poor sleep quality has not been widely explored. It has mostly been in the domain of mental health and considered as a symptom. The aim of this study was to investigate the association of sleep quality among insomniacs and to determine their socio-demographic and health correlates.

Methods: A total of 134 (85 males and 49 females) subjects suffering from insomnia with chief complaint of poor sleep quality/unfreshing sleep were included. Participants were apparently healthy adults, visiting a tertiary care hospital of Delhi as attendants of patients between March-May 2012.Respondents were consecutively selected and clinically evaluatedfor study variables including socio-demographics, substance use (excessive and harmful use of alcohol, cocaine and narcotics), and sleep quality through interview and questionnaire.

Results: Insomnia with poor sleep quality was reported by 76% (n=101) of respondents. Multivariate analyses showed that demographic factors, social support, socioeconomic status (SES), and substance use were positively associated with insomnia and poor quality of sleep. Logistic multivariate regression analyses revealed that it was independently associated with marital status, residence in urban area, middle SES, and alcohol use.

Conclusion: Insomnia with poor quality of sleep is common in the selected sample and is associated with socio-demographic factors, as well as use of alcohol. The study revealed that the most productive population of India i.e. middle aged people from middle socioeconomic status are silently grappling with this overlooked and undiagnosed issue. We recommend screening and intervention programs to be introduced at the organizational level in order to curb this emerging public health issue at its root.

Keywords: Alcohol, Marital status, Urban, Insomnia, Poor quality of sleep, Public health, Socio- economic status.

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Introduction

Disturbed sleep is known to be both a predictive sign and symptom of many illnesses, and is associated with substantial decrements in the quality of life. In addition to health, other socio-demographic, social support, and health practice factors may be related to sleep quality. Numerous studies have shown the fundamental importance of sufficient, restorative sleep in maintaining one's physical and mental health. Women have been found to have more sleep problems than men with higher likelihood to sleep less.[1] Literature has also suggested ethnic/racial differences. Whites report more sleep problems than non-Whites and African Americans are more likely to report both short and long sleep duration possibly because of racial/ethnic differences in predisposition, lifestyle, and culture.[2,3] Low income and low education is associated with increased risk for insomnia in some studies, though it has not been replicated in others.[4,5] Additionally, low emotional support or being single have also been known to be associated with poor sleep quality.[5,6] In terms of health behaviors, prior research suggest lack of physical exercise,[1,6] smoking and excessive alcohol use[7] to negatively impact sleep quality.

Despite a growing recognition of consequences of sleep problems, research on insomnia with poor quality of sleep and the socio-demographic and health profile of this condition in the Indian population is lacking. Using data from an Indian sample population, this research examines the association of socio-demographic characteristics and health profile among adult insomniacs with poor sleep quality.

Materials and Methods

The study was conducted in a cross-sectional manner by the departments of clinical psychology and sleep medicine in a tertiary care hospital of Delhi in North India between March to May 2012. The inclusion criteria were: 1) apparently healthy male and female subjects, 2) age- 18 years and above, 3) visiting the tertiary care hospital as attendants of patients (mostly family members and significant others), 4) those diagnosed with insomnia with chief complaint of unfreshing and/or poor quality of sleep, and 5) willing to participate in the study. Insomnia was defined as sleeplessness and/or difficulty falling asleep, premature and/or frequent awakening in the previous month, and/or early morning awakenings occurring at least three times a week, causing distress. Sleep quality was defined by "tiredness on waking" and/ on reporting "un-freshing mornings". Subjects suffering from 1) anemia, 2) liver and kidney disease, 3) neuro-psychiatric disorders, 4) those on multiple drugs, 5) cardiac failure, 6) spine disorder, 7) any other significant medical disorder contributing to poor sleep were excluded.

Factors previously found to be associated with sleep quality were assessed and included demographic characteristics, socioeconomic status (SES), family/social connections, health practice, and health conditions. Demographic variables included chronological age, sex, and place of residence (urban or rural). SES was measured by education (low- d" Senior Secondary Certificate (SSC), high- e" SSC), and self-reported family economic condition (good versus moderate versus poor). Family structure was classified as living alone, in a nuclear or joint family. Health profile included body mass index (BMI). Substance abuse was categorized as whether the respondent was a user, abusing or dependent on smoking and/or alcohol at the time of interview. Due to small number of participants with history of abuse/dependency on alcohol and smoking, only one category was developed based on use or no use. Sleep quality was measured using Pittsburg Sleep quality Index (PSQI) by Buysse DJ.[8] The PSQI is a 19-item questionnaire that asks participants to report their typical sleep habits within the past month. The overall score of the PSQI is the combined scores of each of the individual measures (ranging from 0-21). Scores less than 5 represent better sleep quality and greater than 5 represent worse sleep quality. All study participants were subjected to psychological evaluation through questionnaires including PSQI for standardized measure of poor quality of sleep. All information was obtained through face to face clinical interview and questionnaires administered by the psychologist (MS). Further, clinical interview was conducted by sleep medicine expert (SP). The subjects were divided into two groups (group A- good and group B- poor sleep quality) based on the cut off score of 5 on PSQI and compared with all study variables.

Statistical testing was conducted with the statistical package for the social science system version SPSS 17.0 (Chicago, IL, USA). Results are expressed as mean ± SD, numbers and percentages. The comparison of normally distributed continuous variables between the groups was performed using Student's t test. Nominal categorical data between the groups were compared using Chi-square test or Fisher's exact test as appropriate. Multivariate analysis using logistic regression was done to predict an outcome

from a set of predictor variables with p-value <0.1 in univariate analysis. A two-sided significance level of p <0.05 was used to indicate statistical significance.

Results

A total of 134 (85 males and 49 females) subjects suffering from insomnia with chief complaint of poor sleep quality/ unfreshing sleep were included in the study. The mean age of the study group was 37 years Majority of the subjects were men (63%), married (64%), living in an urban location (76%), in nuclear family (72%), and from middle SES (72%). Most of the participants consumed alcohol (67%) whereas only 10% of them smoked. Overall average BMI recorded was 25±5. Table 1 demonstrates the distribution and association of demographics, SES, family structure and support, and substance use in the two groups. The 134 participants on further evaluation with PSQI yielded an average PSQI score of 8±5. Approximately 24% (n=33) reported having good sleep quality (PSQI<5).

The study reveals that gender and education had no relationship with sleep quality, whereas age, marital status, location of residence, socio-economic resources and alcohol use seemed to be adversely associated with quality of sleep. Mostly middle aged subjects (aged 39± 13 years) reported having poor quality of sleep (p<.001). As compared to those unmarried, 74% married subjects reported having poor sleep quality (p=.003). 94% of those residing in urban setting had chief complaint of poor sleep quality compared to those from rural areas (p<.001). With regard to economic resources, subjects from middle class (76%, p< .001) suffered from more sleep disturbance than the lower (14%) or higher (10%) class. Current alcohol users (79%) showed significant association with poor sleep quality (p= .001) whereas only 14% of current smokers were poor sleepers.

On logistic regression analysis, middle age increased the odds of having poor sleep by 1.07 times. Middle socioeconomic status increased chances of suffering from poor quality of sleep by 7 times. The odds ratio for subjects residing in urban area was 10.43 while current alcohol users have 5.5 times more chances of having a poor sleep quality with insomnia.

Table 1: Comparison of patient characteristics and socio demographic variables versus sleep quality

Variables	Group A*24%(n=33)	Group B**76%(n=101)	p value***	OR (95% CI)
Age (Mean±SD)	31 ± 9	39 ± 13	**<0.001**	1.073(1.0211.126)
Gender Male Female	75(25) 25(8)	60 (61) 40(40)	0.090	
Marital status Married Unmarried	45 (15) 55 (18)	74 (74) 26 (27)	**<0.003**	0.63(0.197-2.040)
Family Structure Joint Nuclear	21 (7) 79 (26)	30 (30) 70(71)	0.344	
Education < Matric e" Matric	12 (4) 88 (29)	27 (27) 73(74)	0.571	
Residence Rural Urban	6 (2) 94(31)	6(7) 94(94)	**<0.001**	10.43 (3.03-35.9)
Socio-Economicstatus Low Moderate High	30(10) 60(20)1 0(3)	14(14) 76(77) 10(10)	**<0.001**	7.19 (1.55-33.42)
Alcohol No Yes	78 (26) 22 (7)	21 (21) 79 (80)	**<0.001**	5.59 (1.87-16.71)
Smoke No Yes	81 (27) 19 (6)	86 (87) 14 (14)	0.255	

Discussion

The risk factors for development of insomnia are almost identical in all studies and include advancing age, female sex, low socioeconomic status, low education level, poor physical health and psychological /psychiatric problems.[2,9,10] Other factors which have been less frequently reported are unemployment and the loss of relationships.[11] Slightly more women than men reported insomnia, but the difference was not significant.[10] Inconsistent with previous research, we found that men's self-rated quality of sleep was poor than that of women. Our analysis suggested that males were more likely to complain of disturbed sleep than female subjects. Possible mechanisms of these differences in sleep disturbance can be attributed to gender differences in willingness to admit to discomfort, readiness to seek medical attention, prevalence of psychiatric disorders with prominent somatic features, innate differences between men and women in their threshold and tolerance, and work related issues like highly stressful work environment, long working hours and office politics.

Our study did not find any significant association with education level and quality of sleep in insomniacs. These findings are in sync with a previous study conducted by Liu X et al that found no association of education with sleep problems.[12] On the other hand, a study by Grandener MA et al pointed out that education leads to sleep better.[13] Previous studies have also found that gender, younger age and being single negatively affect sleep.[13] With regard to age, we found that middle aged subjects had more complaints of poor quality of sleep than the young and elderly. These results are rather surprising because it might have been expected as a consequence of medical condition and physiological factors strongly associated with age, sleep complaints should increase with age. However, our findings are consistent with Blazer's observation in a comparison of younger and older subjects that both somatic and psychological symptoms decrease in old age[2]. This can also be attributed to middle age crisis and faulty coping mechanisms adopted by most working professionals.

According to a previous study, a stable marriage or cohabitation is associated with better sleep in women than being unmarried or losing a partner[14]. Earlier studies have revealed marriage to be a protective factor associated with good sleep quality[2,12,14]. Another important finding from prior reports is that marriage was positively associated with good sleep quality in a bivariate model with chronological age controls, but was not significantly associated with sleep quality once other covariates were present. Interestingly, in the present study, married subjects reported more sleep complaints and poor quality of sleep than did unmarried. These results can be attributed to additional stress coming from domestic issues including higher sense of accomplishment for better and secured future of the family members, which adds to anxiety and takes a gradual toll on the quality of sleep. This problem is magnified if both partners are professionals working full time, leading to overall poor quality of life. Potential domestic stress and health behaviors related to lifestyle in working population might be taken into consideration in future investigations. This may indicate that the protective effect of marriage on sleep quality is largely determined by other factors at very old ages.

Family support did not reveal any significant association with sleep quality. These findings are rather in contrast to prior reports concluding that those living alone were less likely to have good quality of sleep[5,6,12]. The present piece of research did not replicate the findings from previous studies on SES. Some studies have shown that individuals with rich resources slept longer and had a better sleep quality than resource poor individuals,[4,15] whereas other studies found that income is not associated with sleep problems[9]. In our investigation, we found middle socioeconomic status to be significantly associated with poor quality of sleep. Clearly, research till date has yielded mixed results. This can be explained by the observation that researchers usually control for SES rather than examine it. The effects of lower level SES are generally examined, whenever this parameter is studied,. However, there is evidence of a graded association with health at all levels of SES- an observation that requires new thought about domains through which SES may exert its health effects. Throughout literature, SES has been linked to health and people high in social hierarchy are seen enjoying better health than those below.

It is no less than a fact that non-urban residence promotes good sleep quality, possibly because noise or pollution in urban areas disturbs sleep. Findings from our studies replicates this understanding. In fact urban/rural difference in the quality of sleep can also be attributed to different lifestyles between urban and rural areas and in part to environmental influence and lesser stressful events. Indeed, noise and pollution were possible major causes of poor sleep among urban elders[16]. In line

with previous findings, we found alcohol to be adversely affecting quality of sleep. On the other hand, association between smoke and sleep quality did not show any significant results. Possible explanation for this insignificant association might be that we did not distinguish level of smoking.

Certain limitations need to be acknowledged in the present study. Mostly middle-aged people accompanying patients to the hospital were recruited. These findings could also be attributed to selection bias of sample as the study focused on the persons accompanying patients coming to hospital. Further more nuanced research with larger sample size on sociodemographic profile of insomniacs with poor quality of sleep in adult metropolitan population of India is warranted.

Conclusions

We look at the increasing deterioration of quality of sleep in middle aged population as an emerging public health concern. The study revealed that the most productive population i.e. middle aged people from middle socioeconomic status of India are the most affected. This condition affects nearly a third of all adults, leads to increased medical costs, and results in billions of rupees of lost work productivity. Patients suffering from insomnia with poor quality of sleep usually complain of an impaired day time functioning . The economic impact of behavioral health problems such as poor quality of sleep and insomnia becomes clearer when productivity impairment is factored into the equation along with medical and pharmacy costs borne by the employers. Employers shoulder a dual economic burden associated with chronic conditions, in that they pay for both productivity loss and healthcare costs. Insomnia is a widespread and growing problem which despite its high cost, is not being addressed in a systematic way by health plans, employers, disease management programs, or other healthcare organizations. While treatment, particularly cognitive behavioral therapy, can produce significant and lasting improvements in sleep, only a small percentage of those with sleep problems ever receive professional help.

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