Original Research Article

The Effect of Sleep Disorder on Emotional Empathy and Quality of Life

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ABSTRACT

Background: Sleep plays a vital role in good health and well-being throughout life. Getting enough quality sleep at the right times can help protect mental health, physical health, quality of life, and safety. The damage from sleep deficiency or worse prolong sleep disorder can be gradual or in an instant. Insufficient sleep can raise one's risk for some chronic health problems as a gradual process.
Methodology: The purpose of the study was examining the effect of sleep disorder on emotional empathy and quality of life. Self-report survey data was collected from a total of 60 participants, 30 who were not diagnosed with a sleep disorder and other 30 patients suffering from sleep disorder (sleep apnea) between the ages 18-55.
Result: The results of the t-test of emotional empathy between presence and absence of sleep disorder showed a significant t value of 2.695 at df=58 $p<0.05$ level; that is the obtained value was greater than the critical value and the data was in line with the hypothesis. Whereas the value obtained using t test for Quality of Life between presence and absence of sleep disorder was 5.757 at df=58 $p<0.05$ level that is the obtained value was greater than the critical value and the data was in line with the hypothesis.
Conclusion: The findings indicate that individuals who suffer from sleep disorder (sleep apnea) score lower on empathy scale and quality of life scale as compared to individuals who do not suffer from sleep disorder.

Keywords: Sleep disorder, sleep apnea, emotional empathy, quality of life.

(Paper received – 22nd June 2017, Peer review completed – 30th July 2017, Accepted – 6th August 2017)

INTRODUCTION

It is important to stress that sleep disruption is much more than an individual's frustration at failing to initiate or sustain sleep, or even the sensation of feeling sleepy at an inappropriate time. Disrupted sleep is closely linked to an increased susceptibility to a broad range of disorders, ranging from poor vigilance and memory to reduced mental and physical reaction times, reduced motivation, lower empathy, relationship conflicts [1].

Sleep plays a critical role in a variety of functions, including restoration of the endocrine and metabolic processes [2], energy conservation [3], memory consolidation [4] and recovery of cortical functioning [5]. In support of such a critical role, it has long been established that sleep deprivation degrades several aspects of neurocognitive performance: it reduces learning capacity, impedes divergent thinking, increases ineffective response perseveration [6], increases attention lapses and reaction time [7] and decreases hand–eye coordination [8].

The prefrontal cortex (PFC) is well known to be involved in executive functions as well as in the regulation of emotions, and particularly in the ability to shift to someone else's perspective [9]. Accordingly, sleep deprivation has been shown to greatly influence the ability to process emotional information and its negative effects on mood seem to be more prominent than its effects on cognitive and motor performance [10]. More specifically, sleep loss seems to increase the propensity of the individuals to experience negative emotions [11] and decrease their capacity to recognize emotions from facial expressions [12]. Recent studies have shown that sleep loss affects the ability to recognize and categorize other people's emotions and reduces the individual's self-perceived emotional intelligence by affecting the ability to be empathetic towards others [13] which may result in a higher number of conflicts following a poor night of sleep in young couples.

Recently, the general concept of empathy has been conceptualized into two different components, i.e. cognitive and emotional empathy [14]. Cognitive empathy (also referred to as theory of mind) refers to the individual's ability to understand another person's perspective, feelings and state of mind [15]. It underpins the ability to predict others' behaviour, to manipulate or deceive people to our own advantage, and to understand when individuals are lying or holding a false belief. Conversely, emotional empathy refers to the ability to understand the emotions of others by vicariously sharing them [16]. It can manifest as increased feelings of distress while observing someone else in a negative situation, and does not require an explicit understanding of why the individual is suffering [17].

Sleep and Quality of Life (QOL)

Chronic medical disorders like Sleep disorders and their treatment have a great impact on different aspects of life of the patients and affect their Quality of Life. After the World Health Organization (WHO) defined health positively as 'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity' in 1946, the interest in the concept of 'Quality of Life (QOL)' has drastically increased. It is very difficult to make a precise definition of QOL as it is a multifactorial concept covering several domains. The definition of quality of life changes from society to society as well as from individual to individual in a given society. According to general opinion, the following domains should be covered by the concept of QOL viz. functional competence, complaints about illnesses and treatment, competence in psychological and social functioning [18].

The World Health Organization Quality of Life (WHOQOL) group defines quality of life as an individual's perception of their position in life, in the context of the culture and values in which they live and in relation to their goals, expectations, standards, and concerns. This definition focuses on the way patients evaluate their quality of life from their own perspective [19].

The effects of sleep disorders on quality of life (QOL) have been documented in the literature. Excessive sleepiness and altered circadian rhythms may affect education, employment, and interpersonal relations, and directly degrade QOL, particularly in relation to functional capacity, health and sensation of wellbeing. Although some studies have examined the relation between Sleep disorders and QOL, there is a lack of documented research focusing on factors that can alter the severity of sleep disorder such as sleepiness and physical activity [20].

Sleep Disorder and Empathy

A study in 2006 tested the hypothesis that quality of sleep is predictive of individuals' performance on a task evaluating emotional empathy. Their findings provide evidence of a significant relationship between individuals' quality of sleep and their ability to share the emotions experienced by others. These findings may have important implications for individuals employed in professions requiring social interaction and empathic experience coupled with schedules that interfere with night time sleep [21]. The same researchers in 2014 studied the effects of sleep deprivation on emotional empathy. The results revealed that the post measurements of both direct and indirect emotional empathy of participants in the sleep deprivation group were significantly lower than those of the sleep and day groups. These data are consistent with previous studies showing the negative effect of sleep deprivation on the processing of emotional information, and extend these effects to emotional empathy. The findings reported in the study are relevant to healthy individuals with poor sleep habits, as well as clinical populations suffering from sleep disturbances [22].

A study aimed to study empathy levels in health care workers suffering from Insomnia. Empathy was measured by the Interpersonal Reactivity Index (IRI) across four subscales – fantasy, perspective-taking, empathic concern, and personal distress. Insomnia was measured using the Insomnia Severity Index (ISI). Results showed that insomnia decreases empathy in health care workers and may lead to adverse clinical outcomes and medical errors [23]. A study also indicated that those in relationships who consistently experience poor sleep are more likely to engage in conflict with their partners. The proven emotional consequences of sleep disorders only add to the known physical risks which include increased likelihood of developing cardiovascular disease, hypertension or diabetes and support the American Academy of Sleep Medicine's (AASM) recommendation to obtain diagnosis and treatment from a sleep specialist [24].

Sleep disorder and QOL

A cross-sectional study aimed to evaluate the quality of life of pregnant women with sleep disorders in the second trimester. The results indicated poor quality of life in pregnant women who had sleep disorders. Quality of life had one of domains related to psychological health and quality of sleep [25].

A Turkish research study aimed to identify the level of depression, the level of life quality, and the relationship between these, in patients applying to sleep centers for various sleep problems. Beck Depression Inventory (BDI), Pittsburgh Sleep Quality Index (PSQI), and the World Health Organization Quality of Life Scale (WHOQOL-BREF) were used as assessment tools. The study concluded that sleep quality was significantly poorer in patients who were older aged, married, not working, and who had a chronic disease, and a severe depressive symptom. There was a significantly negative correlation among depression, sleep quality, and life quality, while there was a significantly positive correlation between life quality and depression [26].

A cross-sectional international survey aimed to assess health related quality of life (HRQOL) and utility scores in individuals from three different countries (USA, France, and Japan), comparing sufferers of chronic insomnia to good sleepers. The study concluded that survey suggests that chronic insomnia is associated with significant impairment of HRQOL and decreased utilities across the different geographical regions studied [27].

A study aimed to explore how empathy and self-compassion related to professional quality of life (compassion satisfaction, compassion fatigue and burnout). Additionally also test whether self-compassion may be a protective factor for the impact of empathy on compassion fatigue. The study concluded that high levels of affective empathy may be a risk factor for compassion fatigue, whereas self-compassion might be protective. Teaching self-compassion and self-care skills may be an important feature in interventions that aim to reduce burnout and compassion fatigue [28].

Empathy and QOL

A Korean study aimed to understand the relationships between empathy, quality of life, and other factors among Korean emergency physicians. Correlation analyses were performed, along with sub-analyses according to gender using the Jefferson Scale of Empathy and the Brief version of the World Health Organization Quality of Life assessment instrument. Results concluded that the more experienced specialist emergency physicians are, and the better quality of life they have, the higher level of empathy scale they have. Therefore, good quality of life could lead to good empathy, and vice versa. Good quality of life and good empathy could lead to the better outcome in emergency care. However, because the female physicians show different patterns of empathy and quality of life, further study is needed [29].

METHODOLOGY

Hypotheses

There are two hypotheses for the present study. They are as follows –

1. Individuals diagnosed with Sleep Disorder will score lower on Empathy Scale as compared to individuals without sleep disorder.

2. Individuals diagnosed with Sleep Disorder will score lower on Social Relationships domain of Quality of Life Scale as compared to individuals without sleep disorder.

The study is a non -experimental design survey research with one independent variable having 2 levels and 5 dependent variables. To comply with the objective of the study, a sample size of 30 patients suffering from sleep disorder and 30 individuals who are not diagnosed with sleep disorder. Sample was collected from Sleep Clinics in Mumbai. The sampling method used was convenience sampling. Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher.

Scales used in the study

1. **Multi-Dimensional Emotional Empathy Scale** [30] – The scale is a 30 item empathy scale with 6 subscales and good reliability and validity across various studies.
2. **World Health Organization Quality of Life – BREF** [31] - The WHOQOL-BREF instrument comprises 26 items, which measure the following broad domains: physical health, psychological health, social relationships, and environment. The WHOQOL-BREF is a shorter version of the original instrument that may be more convenient for use in large research studies or clinical trials.

STATISTICAL ANALYSIS

There were two groups of subjects – those with and without sleep disorder. The student t test was used to ascertain differences between the two groups on both the scales used. The statistics was done using computerised statistical software.

RESULTS

The result of the collected data was quantitatively analyzed. Before performing t-test, normality and homogeneity were checked. Skewness and kurtosis values were examined to check the normality of the scores obtained for the dependent variables. Results revealed that for the population with the absence of sleep disorder, the skewness and kurtosis for Emotional Empathy scale was -0.26 and -0.39 respectively. And the skewness and kurtosis for Quality of life scale was 0.28 and -1.16 respectively. These values remain in between the range of -1 and +1, which is an acceptable range for the normality range for t-test.
Skewness and kurtosis values were examined to check the normality of dependent variables as well. Results revealed that for the population with the presence of sleep disorder, the skewness and kurtosis for Emotional empathy scale was 0.92 and 0.011 respectively. And the skewness and kurtosis for Quality of life scale was -0.011 and -0.423 respectively. These values remain in between the range of -1 and +1, which is an acceptable range for the normality range for t-test.
With reference to the table 2, the obtained t value for emotional empathy is 2.695 at degrees of freedom 58. The obtained value was significant at 0.0045 level and thus the data calculated was significant. The first research question tested whether individuals diagnosed with Sleep Disorder will score lower on Empathy Scale as compared to individuals without sleep disorder. In lieu of the above results, the first hypothesis is verified and can be accepted. The t value for emotional empathy was obtained as 5.757 at degrees of freedom 58. The obtained value was significant at 1.701 level and thus the data calculated was significant. The second research question tested whether individuals diagnosed with Sleep Disorder will score lower on Social Relationships domain of Quality of Life Scale as compared to individuals without sleep disorder. In lieu of the above results, the second hypothesis is verified and can be accepted (Table 1).

DISCUSSION

Two independent-samples t-test was conducted on patients with sleep apnea and those who were not diagnosed with any sleep disorder. The t test was computed to study emotional empathy and quality of life (social) between the two groups.

Table 1 – Scores on the various scales across both the groups

Scale Used	Sleep Disorder Present	Sleep Disorder Absent	t test	p value
	N = 30			
Multidimensional Emotional Empathy Scale	6.03 ± 0.53	7.49 ± 0.4	12.0432	0.0001*
WHO Quality of Life BREF	44.57 ± 13.51	68.53 ± 18.56	5.7167	0.0001*

Statistics is done using the unpaired t test ($p < 0.05$ = significant*)

A study aimed to examine executive control and emotional processing in children suffering from pediatric obstructive sleep apnea (OSA). The children participants were made to do an empathy task consisting of dynamic visual scenarios depicting interpersonal harm or neutral actions in a magnetic resonance imaging (MRI) scanner. The results revealed a significant correlation between apnea-hypopnea index and left amygdala activity in harm versus neutral actions, which were further indicative of there being a link with emotions and reduced empathy in children with OSA [32].

Neurologically, a study has indicated a link between sleep disorder and the emotion centre of the brain i.e. the amygdala. Psychologically, previous studies have indicated interpersonal conflicts and low scores on empathy tasks and scales in individuals suffering from sleep disturbances and disorders [33].

A study aimed to determine the prevalence of sleep disorders in patients on hemodialysis and to evaluate the association between quality of sleep and quality of life in these patients. The results showed that lower hemoglobin levels correlated with worse quality of sleep and quality of life. The study further hypothesized that correction of anemia may improve quality of life in patients on hemodialysis. Poor sleep is associated with lower quality of life in hemodialysis patients [34].

A study was conducted to determine the effect of middle and long-term positive airway pressure (CPAP) treatment on the health-related quality of life in patients with obstructive sleep apnea. 2 groups of patients were studied, one for the duration of 6 months and other for 18 months. It was found that health-related quality of life of obstructive sleep apnea patients improves with long term CPAP treatment and these changes are clinically relevant in several health dimensions. Thus, quality of life of patients with OSA could improve with long-term treatment [35].

It has been seen that poor quality of life is associated with individuals with sleep disorders and prolonged sleep disturbances. All the above stated studies collaborate with the hypothesis of the present research and are in line with the hypothesis.

CONCLUSION

The purpose of the study was to examine whether the presence of a sleep disorder, impacts an individual's empathy and quality of life in Mumbai. The inferential statistics of 2 Independent sample t-tests was used to analyze the data. The findings indicate that individuals who suffer from sleep disorder (sleep apnea) score lower on empathy scale and quality of life scale as compared to individuals who do not suffer from sleep disorder. With the support of past studies, it was found that there was a significant relationship between sleep disorder, empathy and quality of life.

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Acknowledgements – Nil
Source of Funding – Nil
Conflict of Interest – Nil