**Relationship of Social Interaction Anxiety, Body Image and Sleep Disturbance among Obese**

**Abstract**

*The purpose of the present study was to explore the impact of social interaction anxiety and body shape on general sleep disturbance among obese. The sample consisted of 211 participants taken from general population. Their age range was between 20 to above 50 years. General Sleep Disturbance Scale (GSDS),Social Interaction Anxiety Scale (SIAS) and Body Shape Scale (BSS) were used to measure the degree of general sleep disturbance, social Interaction anxiety, and body shape among obese. Results indicated that General Sleep Disturbance and Social Interaction Anxiety was high among the female as compared to male (p<0.01). On the other hand male were found more conscious about their body shape as compared to female. As concerned with demographic variables, sleep disturbance was high among unmarried individuals as compared to married ones (p<0.01). Significant social interaction anxiety differences on demographic variables (e.g. marital status, age) and positive relationship between Social Interaction Anxiety and Sleep disturbance were found.*

*Keywords:*general sleep disturbance, social interaction anxiety, body shape, obese

**Introduction**

Sleeplessness is an observation of insufficient sleep. It has been considered for a long time that the basic reasons of Sleep Disturbance are frustration and Tension (Adrien, 2002), Sleep Disturbance also resulted in worse outcomes like Disturbance of mood, Unclear-sightedness and lose of self-motivation. (Harvey, 2008). The Association among disturbance of mood, anxiety and Sleep Disturbance in both mentally unhealthy and healthy people have been shown in recent studies. Hamilton in the past, said that, stress is the result of sleep disturbance. Many people who are affected from depression have claimed that their main problem is sleep; all their problems would come to an end if the sleep on time. Sabrra and Aleen (2009) says, that the Disruption of sleep is commonly due to Stress and exhaustion. Disturbance of sleep results in many plausible issues linked to anxiety including threat related to neutralism on the way to non-clear urge and the excess amount of memories that are declared negatively determined. Disturbance of sleep increases the chances of depression and stress (Van der helm and Walker, 2009).

From all problems related to sleep, insomnia is common problem in most of the people. Insomnia is usually occurred up to 35% of the population (Bixler 1979).There are some demographic variables like age and gender also influenced in insomnia and may also cause other health related issues. In most studies, it is revealed that the ratio of insomnia in women is higher than men, and main demographic variable is age. As age increases the ratio of insomnia also increases (Ford and Kamerow, 1989). Other different causes of insomnia in psychiatric issues might be stress, depression and anxiety. In the range of anxiety, the issues related to social anxiety, withdrawal of love ones, unfulfilled social commitments, specific phobias, post-traumatic stress disorder and other daily life issues may be a source of insomnia (Wooten 1994, Walsh et al 1994). Some of the studies have also related sleep disturbance to obesity and investigated the relationship among both (Goodwin et al, 2007). Different type of sleep disturbances or sleep problems as severe sleep bounds, disruptive sleep patterns, and circadian rhythmic problems are prevailing in adult population. Severe sleep bounds and circadian rhythmic problems are quite prevalent in adolescent and children too. Disruptive sleep problems are becoming more common in the prevalence and for the hug increment of obesity in adolescents and children. All these sleep related problems and sleep disturbances are becoming a huge cause of obesity (Korean et. al 2015).

Different researches have shown increased levels of obesity issue in relation with decrement in sleep duration. (Adrien, 2002). Many of studies have indicated that the sleep shortage problem may inclined individuals to weight gain by enhancing the body need and thus energy intake as a result of substitute levels of the body need controlling Chemical Compounds, such as gherkin and lepton. (Siegel, *et al*., 2005).The sleep shortage pattern is the most common sleep behavior, in-relation with obesity has been checked in various studies which suggested that there is relationship a relationship exists between both phenomenon. Lack of sleep is also linked with the poor instinctive control, menace behaviors and other mental as well as the cerebral deficits that may take part in the weight gain. While in contrast, some of the studies have also suggested that the short sleep pattern may not independently influence obesity (Fryar, Carroll, and Ogden, 2012).

In few studies there is an overlap of anxiety and depression, and their association with the sleep disturbance. So it also has been endeavor to control this overlap for attaining more precise results of sleep disturbance and their association with anxiety. So the participants who have depression excluded from the study. After such scrutiny in studies, it has been founded a significant relationship between sleep and anxiety. For instance, it has been founded that the patients having complaints of insomnia and lack of energy has significantly higher scores in generalized anxiety disorders, social phobia patients, as compared to the patients having psychiatric disorders excluding major depression (Stein, Chartier and Walker, 1993). Generalized anxiety disorder having diagnostic criteria including symptoms related to sleep, Particularly, generalized anxiety disorder’s diagnostic criteria include problems staying or falling asleep; restless, unsettled sleeps at night and exhaustion during the day (American Psychiatric Association, 2000).

Another concern issue named as social anxiety that also plays a role in sleep disturbance, people having lesser social issues have lesser rest problems. Many people having different social problems also face restlessness. There are number of variables related with the social uneasiness, these elements might be joblessness, absence of consideration from loved ones, no sentimental relationship, and different connections like no companions or terrible associations with the relatives (Schneier et al., 1994). Another factor that bothers rest is nervousness which is regularly associated with a sleeping disorder, there may likewise be different issues like resting in daytimes, having bad dreams and extremely low quality of rest (Hasler et al., 2005). Some researchers have indicated that Social interaction anxiety has a relationship with body esteem and higher sedentary behavior. As sedentary behavior has a very little social mobility and due to this lack of mobility, person leads toward obesity which causes body dissatisfaction. And another factor contributes a lot in this prevalence of social interaction anxiety which is low body esteem. Therefore, obese individual are less socially interacted people or they are more likely to develop social interaction anxiety (Abdollahi et al. 2015).

In an examination 30 to 40 percent of individuals announced having unpredictable or manifestations like limited capacity to focus on sleep, in which 10 to 15 percent individuals were analyzed having continuous sleep disorder, tension, state of mind issue, and other problems which suggests that there is a tenacious difference in inclination of individuals confronting a sleep disorder and other related issues with rest (Roth and Roehrs, 2003). Abdollahi studied low body esteem and self-esteem in relation with social interaction anxiety and concluded that when people have low body esteem they move towards the lower self-esteem this phenomenon make them less socially interaction and the criticism of people is also a huge cause of social interaction anxiety (Abdollahi et al., 2016).

**Obesity and Sleep Disturbance**

Researchers have suggested that the other likely part of obesity is sleep disturbance. An investigation uncovered that long working hours and restlessness influence eating patterns as well as weight of individuals (Leger, 2000). Studies have also given an insight that teens are also facing the issue, an examination clarified that rate of lack of sleep in teenagers is higher than grown-ups and youthful kids (Mantz et al., 2000). At that point primary reason of lack of sleep in youths are "sitting in front of the TV, school plans, later check in time, working hours, and different exercises which affect their sleep wake cycle, Where youngsters used to rest in late night and awaked in early morning (Wolfson and Carskadon, 1998). It has been evaluated in the current investigations that since 1980 overall prevalence of obesity has been doubled. This obesity problem has been paralleled in present day society by a pattern of sleep disturbance. The poor rest quality, which is regularly connected with the general rest problem, has additionally turned into a successive objection. Lack of rest makes hormonal changes it has several hormones involved in this which are highly regulated by the sleep-wake cycle during 24 hours a day, some neurotransmitters are highly responsible for it, For example, serotonin discharge during the sleep (Bourgin et al., 2000). It has been also watched that sleep disturbance is a problem that happens because of the impacts of digestion. Serotonin plays an important role in this regard, Generally the level of serotonin is substituted all through sleep duration so sleep disturbance and rest unsettling could be due to the lower efficiency and its extension could be the reason of sound sleep. Sleep disturbance may play an important role in obesity (Wurtman and Wurtman, 1995).

Different studies have demonstrated the effect of sleep disturbance on obesity and suggested that sleep disturbance could play a role in the prevalence of obesity, which have been centering upon the investigations in the grown-ups. Different studies have discovered that there could be several reasons of obesity and it has been multiplied since 1980. In 2008, 1 out of 10 grown-ups were watched examined, which gave the results that women are more likely to get obesity than men, which was paralleled by a pattern of sleep disturbance. Both experimental and survey researches have been done to investigate the role of sleep disturbance in the prevalence of obesity. It is watched that sleep is a vital modulator of the neuro endocrine capacity and the glucose digestion and sleep disturbance which has been indicated bringing about the metabolic and an endocrine adjustment, including the diminished glucose resistance and modification of the craving managing hormone, which suggests that the connection between sleep disturbance and obesity (Sabrara and Allen, 2009).

**Association between Anxiety and Body Mass Index**

Obesity, anxiety, and social uneasiness has solid affiliation. The general population having higher weight turn into the probability of tension and social anxiety. The normal estimation of BMI (Body Mass Index) is under twenty five. Individuals having 30 or 30+ BMI are in the range of obesity (DeJesus et al 2016). These individuals pronounced as obese, on the grounds that their overweight make issues to keep up the connections with others in the society. These individuals ordinarily neglected to keep up their companionship, adoring and hint connections. Their sexual life additionally harms because of neglecting behavior by the others. At first this examination directed on kids and demonstrated the outcomes that higher weight file have larger amount of social anxiety. Later on comparative investigation led on the grown-ups and comparative outcomes established (Rofey et al., 2009). Moreover, it is also possible that there could be other several reasons which could take part in obesity and the increment of BMI there could be different factors which could be the reason of the affiliation of both BMI and social anxiety, For example, earlier examinations have demonstrated a relationship among backwards influences and issue with grown-up's indulging. While excessive eating is connected with the weight, so it is an exceptionally natural reason for overweighting or BMI (Jansen et al., 2008).

As concerned with other reason and factors some studies have been done and found a relationship between less physical movement and higher BMI for pre-adult young ladies and young men. In this examination an uncommon point raised about the calories enhancement and the level of BMI (Aronne, Mackintosh, Rosenbaum, Leibel, and Hirsch 1997). The concept of weight management is important to keep control of so that the body can achieve and maintain good health. In today’s society, people have created an ideal sense of beauty and body image that is difficult to maintain. Women are especially prone to feeling dissatisfied with their body shape and feel pressured to stay thin. Comparisons of body weight, family and friend influence, environmental changes, food availability, and doctoral advice all affect body shape. Various shapes and sizes can form a healthy body, but exercise, rest, and nutritious food items must be part of the daily routine (Fox and Hillsdon, 2007). Pedro and Tollman (2016) has done a study on obese women in south Africa and findings suggested that most of the women belonging to rural areas are dissatisfied with their body image and they idealize western body shape and size as compare to their own (Pedro et al, 2016). Some of the studies have demonstrated that adolescents are more likely to be conscious in terms of body imaging because there are several other consequences are related to this like bullying, criticism, and hooting etc. (Voelker et al. 2015).

**Rationale**

For a long time it has been considered that the basic reason of sleep disturbance is due to depression and anxiety. Obesity is such a syndrome that is highly created by the synergy of a combination of the genital, a nutritious, the style of living and some contingent factors**.** In presenting research the level of sleep disturbance social interaction anxiety and body shape among obese have been examined**.** In this study it has been elaborated the association between general sleep disturbance & social interaction anxiety on the implications of body mass index**.** Purpose of the research was to check the relationship of general sleep disturbance and social interaction anxiety, and also to check the mediating role of body shape. Existing literature talked about body image and consequences of obesity (Schwartz and Brownell, 2004, Voelker et al. 2015 and Pedro et al, 2016). Very few indigenous investigations on obese has been reported e.g. meta cognitive believes, emotional eating and role of stress and mindfulness (Manzoor and Batool, 2018).

**Objectives**

1. To explore the demographic differences (gender, age, marital status) on social interaction anxiety, body image and general sleep disturbance among obese (if any).
2. To investigate the relationship between social interaction anxiety and general sleep disturbance among obese.
3. To explore the mediating role of body image in the relationship between social interaction anxiety and general sleep disturbance among obese.

**Methods**

**Participant**

In order to obtain a sample for current research, sample consisting of total 211 males (N=98, 46.4%) and females (N=113, 53.6%) of age range 20 to 55 years with mean age of (M=30.9, F= 31.6). Purposive Convenient sampling was used for collection of data. All individuals were diagnosed as obese on the basis of their BMI. All participant were informed about the purpose of the study and were insured about the confidentiality of information. Questionnaires were administered to the obese individuals.

**Instruments**

**General Sleep Disturbance Scale (GSDS)**

Shahid, Wilkinson, Marcu, and Shapiro (2012) developed general sleep disturbance scale. That scale consisted on twenty one items which measures the frequency and problems in sleep. Questions pertain to a variety of general sleep issues, including: problems initiating sleep, waking up during sleep, waking too early from sleep, quality of sleep, quantity of sleep, fatigue and alertness at work, and the use of substances to induce sleep. GSD questionnaire was recommended in studies and identifies the problem of a person regarding sleep. Participants select how much they agree or disagree with each of the 21 items using a 7 point scale that ranges from 0 to 7. The highest score shoed greater sleep disturbance.

**Social Interaction Anxiety Scale (SIAS)**

Mattick and Clarke (1998) formulated Social Interaction Anxiety Scale. The SIAS is a 20 item scale, it check the level of social interaction anxiety in obese individuals. Highest score on the scale shows higher level of social interaction Anxiety Scale.

**Body Shape Questionnaire (BSQ)**

Body shape scale was developed by Cooper, Taylor, Cooper, & Fairburn, (1987). Body shape scale was designed to assess the perception of men and women about their bodies. This scale consisted of 34 different questions which focused on problems related to image of the body and effects on the body after quitting foods. This is 6 point scale that ranges from Never to Always. According to the scoring of this questionnaire, No concern, when the total score was lower than or equal to 110, Mild, when the total score was higher than 110 and lower than or equal to 138 , Moderate, when the total score was higher than 138 and lower than or equal to 167 , Severe, when the total score is higher than 167.

**Procedure**

The sample of this research was taken from obese individuals of southern Punjab. The 211 adults participated in this study. Permission from the higher authorities was granted to conduct this investigation. Purpose of this research was explained to them. After getting permission their privacy and confidentiality was ensured. Participants completed the demographic information which included information related to age, gender, education, marital status, relationship status, No. of children, height, weight and all three questionnaires were completed by the participants. Each of the participants took 10 to 15 minutes for the completion of the questionnaires. After completion of all questionnaires the data was statistically analyzed and results were concluded.

**Results**

Data was analyzed on the basis of the objectives of the study by using SPSS, smart PLS

***Table 1***

*Frequencies of all groups of Body Mass Index (BMI) of the Respondents*

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Frequency | Percent |
|  | Moderately Obese | 55 | 26.1 |
| Mildly Obese | 29 | 13.7 |
|  |  |  |
| Overweight | 96 | 45.5 |
| Severely Obese | 30 | 14.2 |
| Underweight | 1 | 0.5 |
| Total | 211 | 100.0 |

Table 1 represented the frequencies of all groups of body mass index BMI of the respondents. Five categories has been observed by using BMI. 55 (26.1%) respondents belong to moderately obese, 29 (13.7%) respondents belong to mildly obese, more respondents have overweight i.e. 96 (45.5%), 30 (14.2%) respondents belong to severely obese and only 1 (0.5%) respondent has underweight.

***Table 2***

*Gender Difference of GSDS, BSS and SIAS*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variables | Gender | N | Mean | SD | t-statistic | p-value |
| GSDS | Male | 98 | 3.260 | 0.640 | 6.851 | 0.000\*\*\* |
| Female | 113 | 3.935 | 0.784 |
| BSS | Male | 98 | 3.656 | 0.448 | 7.947 | 0..000\*\*\* |
| Female | 113 | 4.170 | 0.491 |
| SIAS | Male | 98 | 42.174 | 7.343 | 3.429 | 0.000\*\* |
| Female | 113 | 46.097 | 9.206 |

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001

*Note*: GSDS= General Sleep Disturbance Scale, SIAS= Social Interaction Anxiety Scale, BSS= Body Shape Scale

Table 2 indicates the gender difference of general sleep disturbance scale (GSDS), body shape scale (BSS) and social interaction anxiety scale (SIAS). Significant gender difference has been found among all the variables. In GSDS, female average GSDS score (3.935) is higher as compare to male average GSDS score (3.260). Highly significant gender difference has been found in GSDS (*t*=6851, *p*=0.000). In BSS, female average BSS score (4.170) is higher as compare to male average BSS score (3.656). Highly significant gender difference has been found in BSS (*t*=7.947, *p*=0.000). In SIAS, female average SIAS score (42.174) is higher as compare to male average SIAS score (46.097). Highly significant gender difference has been found in SIAS (*t*=3.429, *p*=0.001). Thus, all results of GSDS, BSS and SIAS supported to our study hypothesis.

***Table 3***

*Marital Status (MS) Difference of GSDS, BSS and SIAS*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variables | MS | N | Mean | SD | t-statistic | p-value |
| GSDS | Married | 137 | 3.219 | 0.687 | 2.26 | 0.02\* |
| Unmarried | 74 | 3.451 | 0.760 |
| BSS | Married | 137 | 3.650 | 0.407 | 3.146 | 0.002\*\* |
| Unmarried | 74 | 3.885 | 0.571 |
| SIAS | Married | 137 | 42.365 | 8.577 | 2.328 | 0.021\* |
| Unmarried | 74 | 43.930 | 7.045 |

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001

*Note*: GSDS= General Sleep Disturbance Scale, SIAS= Social Interaction Anxiety Scale, BSS= Body Shape Scale

Table 3 showed the marital status (MS) difference of general sleep disturbance scale (GSDS), body shape scale (BSS) and social interaction anxiety scale (SIAS). Significant gender difference has been found among all the variables. In GSDS, unmarried average GSDS score (3.451) is higher as compare to married average GSDS score (3.219). Highly significant marital status difference has been found in GSDS (t=2.260, p=0.025). In BSS, unmarried average BSS score (3.885) is higher as compare to married average BSS score (3.650). Significant marital status difference has been found in BSS (t=3.14,p=0.002). In SIAS, unmarried average SIAS score (43.930) is higher as compare to married average SIAS score (42.365). Significant marital status difference has been found in SIAS (t=2.238, p=0.021).

***Table 4***

*Descriptive Statistics of GSDS, BSS and SIAS among age groups*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variables Age in  years | | N | Mean | SD | 95% Confidence Interval for Mean | |
| Lower Bound | Upper Bound |
| GSDS | Between 20 to 30 | 98 | 3.4072 | .72827 | 3.2612 | 3.5532 |
| Between 31 to 40 | 82 | 3.2207 | .67121 | 3.0732 | 3.3682 |
| Between 41 to 50 | 31 | 3.1720 | .79021 | 2.8822 | 3.4619 |
| BSS | Between 20 to 30 | 98 | 3.6501 | .47761 | 3.5543 | 3.7458 |
| Between 31 to 40 | 82 | 3.6478 | .44932 | 3.5490 | 3.7465 |
| Between 41 to 50 | 31 | 3.7467 | .50606 | 3.5611 | 3.9323 |
| SIAS | Between 20 to 30 | 98 | 42.6837 | 8.93573 | 40.8922 | 44.4752 |
| Between 31 to 40 | 82 | 42.9512 | 7.71867 | 41.2552 | 44.6472 |
| Between 41 to 50 | 31 | 41.8710 | 8.50389 | 38.7517 | 44.9902 |

*Note*: GSDS= General Sleep Disturbance Scale, SIAS= Social Interaction Anxiety Scale, BSS= Body Shape Scale

Table 4 showed the descriptive statistics of GSDS, BSS and SIAS for different age groups. We use three categories of age groups namely, between 20 to 30 years, between 31 to 40 years and between 41 to 50 years. Table shows the sample size (N) mean, standard deviation (SD) and 95% confidence interval lower and upper boundaries. GSDS score higher among those respondents who have age between 20 to 30 years as well as no massive difference exist among age groups in GSDS. BSS score higher among those respondents who have age between 41 to 50 years. SIAS score approximately same among all age category and no massive difference exist here. Thus, mean score in all variable lies between 95% confidence interval boundaries.

***Table 5***

*Analysis of variance (ANOVA) of GSDS, BSS and SIAS among age groups*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | Sum of Squares | df | Mean Square | F | p-value |
| GSDS | Between Groups | 2.150 | 2 | 1.075 | 2.096 | .126 |
| Within Groups | 106.672 | 208 | 0.513 |  |  |
| Total | 108.822 | 210 |  |  |  |
| BSS | Between Groups | 0.252 | 2 | 0.126 | 0.569 | .567 |
| Within Groups | 46.163 | 208 | 0.222 |  |  |
| Total | 46.415 | 210 |  |  |  |
| SIAS | Between Groups | 26.295 | 2 | 13.147 | 0.186 | .831 |
| Within Groups | 14740.483 | 208 | 70.868 |  |  |
| Total | 14766.777 | 210 |  |  |  |

*Note:* GSDS= General Sleep Disturbance Scale, SIAS= Social Interaction Anxiety Scale, BSS= Body Shape Scale

Table 5 represented the analysis of variance for GSDS, BSS and SIAS variables among age groups. In GSDS, no significant age difference found (F=2.096, p=0.126). It means GSDS score is same in all age groups because p-value provides the evident against our hypothesis. Furthermore, in BSS, no significant age difference was found (F=0.569, p=0.567). It means BSS score is same in all age groups because p-value provides the evident against our hypothesis. Finally, in SIAS variable no significant difference was found (F=0.186, p=0.831). It means SIAS score is same in all age groups because p-value provides the evident against our hypothesis. Thus, we conclude that this study provide the evidence for significant age groups difference exist in GSDS, BSS and SIAS scale. Therefore, the effect of GSDS, BSS and SIAS is same in all categories of age.

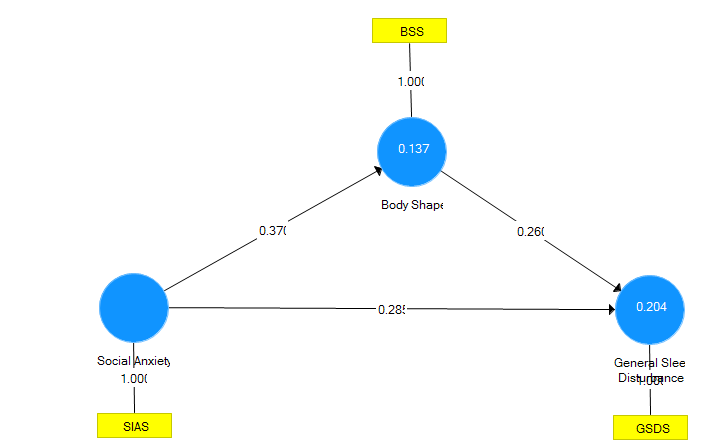


Figure 1: General Model-I for Mediation of Body Shape

Figure 1 represented the conceptual model of study in which body shape scale (BSS) played as mediating role, social interaction anxiety scale (SIAS) used as predictor and general sleep disturbance scale (GSDS) used as dependent variable. This path coefficient analyzed through Smart PLS-SEM software. SIAS has showed positive impact (0.370) on BSS, BSS has showed positive impact (0.260) on GSDS. SIAS has showed direct positive impact (0.285) on GSDS. When SIAS is used directly as a predicator variable on GSDS with coefficient of determination (R2 = 0.204). When SIAS is used as indirect via mediating with coefficient of determination (R2 = 0.137).

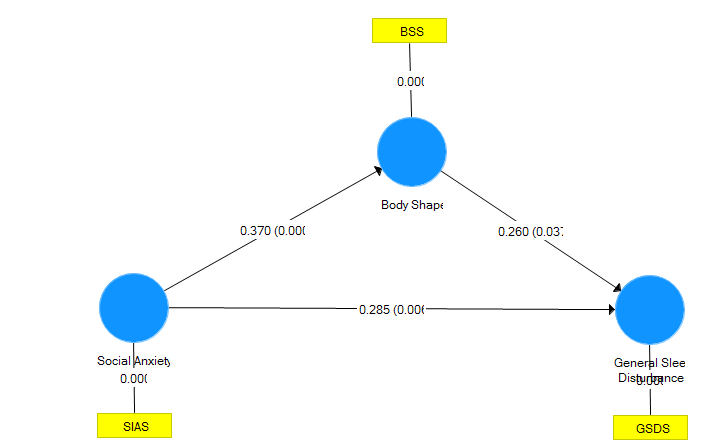


Figure 2: Bootstrapping Model-II for Mediation of Body Shape scale

Figure 2 displayed the Bootstrapping Model-II for Mediation of Body Shape scale. In which path coefficients and p-value are displayed, p-value showed in parenthesis. SIAS showed positive impact 0.037, (0.000) on BSS; BSS showed positive impact 0.260, (0.037) on GSDS. SIAS showed direct positive impact 0.285, (0.006) on GSDS.

**Table 6**

Hypothesis Path coefficients for Mediation Analysis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hypothesis | Coefficients | SD | t-statistic | p-values |
| Body Shape -> General Sleep Disturbance | 0.260 | 0.125 | 2.091 | 0.03\* |
| Social Anxiety ->Body Shape | 0.370 | 0.103 | 3.604 | 0.00\*\* |
| Social Anxiety -> General Sleep Disturbance | 0.285 | 0.104 | 2.750 | 0.006\*\* |

*Note*: \*p<.05, \*\*p<.01, \*\*\*p<.001

The partial least square structural equation modeling (PLS-SEM) results are shown in Model-I and Model-II. SIAS has shown positive impact on BSS as well as on GSDS and the direct positive impact of SIAS on GSDS as shown in Model-1. Moreover, BSS played significant mediating role as displayed in Model-II and it also displayed through hypothesis testing given in Table 6. While, SIAS has shown positive impact on BSS, BSS has positive impact on GSDS and the direct positive impact of SIAS on GSDS shown in Model 2. Moreover, BSS plays significant mediating role display in Model 2 and it also displayed through hypothesis testing given in this table. The coefficient of determination (R2) was significant in both models. Table 6 displayed the hypothesis in which SIAS shown significant impact on BSS is (β=0.370,t=3.604, p<0.01), SIAS shown significant impact on GSDS is (β=0.285,t=2.750, p<0.01), BSS showed significant mediating impact on GSDS is (β=0.260,t=2.091, p<0.05) and the results are supported to the hypothesis of our study.

***Table 7***

*Correlation Matrix between SIAS and GSDS*

|  |  |  |  |
| --- | --- | --- | --- |
|  | | General Sleep Disturbance Scale | Social Interaction Anxiety Scale |
| GSDS |  | 1 | 0.381\*\* |
| SIAS |  | 0.381\*\* | 1 |

\*p<.05, \*\*p<.01, \*\*\*p<.001

*Note*: GSDS= General Sleep Disturbance Scale, SIAS= Social Interaction Anxiety Scale

Table 7 displayed the correlation between GSDS and SIAS. Significant positive correlation has been found. GSDS significantly positively correlated to SIAS. Thus, if GSDS score increase then SIAS score will also increase tremendously. It showed significant positive correlation between GSDS and SIAS.

**Discussion**

Several researches have been conducted on general sleep disturbance social interaction anxiety and body shape relation in different ways, in-relation with different variables. But very few researches have been found on obese population, the current study has been done to explore the effect of social interaction anxiety on general sleep disturbance and mediating role of body shape among obese.

The first assumption of the study was to explore the differences on demographic variables (gender, marital status and age) on social interaction anxiety, body image and general sleep disturbance among obese. Results revealed significant differences on gender and marital status but no significant difference among different age groups. There could be several reasons for these results. It might possible that culture is one of the contributing factor for gender difference on social interaction anxiety, body image and sleep disturbance. Indigenous investigation on juveniles has also explored the gender difference on self-concept and social interaction anxiety (Hussain, Batool, Khan and Bajwa, 2017). Correlates of body weight were investigated and perceived stress and antisocial behavior were reported as strong correlates (Papadopoulos and Brennan, 2015). In the same line few researchers suggested that Gender is the main factor in sleep disturbance and many studies have revealed that the level of sleep disturbance is high among females than males (Ford and Kamerow, 1989). It was hypothesized that Social interaction anxiety is high among female as compared to male few researches have also suggested the same (Romero-Corral A, 2008). Results revealed that females feel difficulty in interaction with other as compared to males. While, Male are more comfortable to interact with others. This difficulty leads females towards anxiety. So, females try to avoid others to avoid that difficulty. Another assumption was about the difference on General Sleep Disturbance, body shape, and social interaction anxiety among married and unmarried participants. Results revealed significant difference and these findings are in the line of previous research which suggested that obesity, gender, age and marital status affect these variables (McAllister et al. 2009).

It was hypothesized that young obese have less sleep disturbance, are more concerned with body image, and have more social interaction anxiety than late adults. In previous researches both sided reviews have been found regarding this hypothesis some have said that young adults and teenagers have more sleep disturbance (Mantz et al., 2000). While others have said that late adults have more sleep problems (Wolfson and Carskadon, 1998). Findings revealed that youngsters have more sleep disturbance higher level of consciousness about body image and are less socially interacted which means they have more social interaction anxiety.

Another assumption of the study was that body shape plays a mediating role for general sleep disturbance and social interaction anxiety, and there is positive relationship of general sleep disturbance and social interaction anxiety. Results showed that body shape played mediating role and it has positive impact on general sleep disturbance and the direct positive impact on social interaction anxiety results also revealed that there is a significant positive relationship between general sleep disturbance and social interaction anxiety. Previously it was reported that body image partially mediates the relationship between obesity and psychological distress (Friedman, Reichmann, Costanzo, and Musante (2002).

**Conclusion**

The findings of the study concluded that there is significant difference was found on demographic variables. There is positive relationship between general sleep disturbance and social interaction anxiety and body image plays a mediating role in this relationship.

**References**

Abdollahi, A., & Talib, M. A. (2015). Sedentary behaviour and social anxiety in obese individuals: the mediating role of body esteem. *Psychology, health & medicine*, 20(2), 205-209.

Abdollahi, A., & Abu Talib, M. (2016). Self-esteem, body-esteem, emotional intelligence, and social anxiety in a college sample: The moderating role of weight. *Psychology, health & medicine, 21(2)*, 221-225.

Adrien, J. (2002). Neurobiological bases for the relation between sleep and depression. *Sleep Medicine Reviews*, *6*, 341-351.

Adrien, J. (2002). Neurobiological bases for the relation between sleep and depression. *Sleep Medicine Reviews*, *6*, 341-351.

American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders (revised 4th ed.). *Washington, DC: Author*.

Aronne, L. J., Mackintosh, R., Rosenbaum, M., Leibel, R. L., & Hirsch, J. (1997). Cardiac autonomic nervous system activity in obese and never‐obese young men. *Obesity research*, *5*(4), 354-359.

Bourgin, P., Huitrón-Reséndiz, S., Spier, A. D., Fabre, V., Morte, B., Criado, J. R., ... & De Lecea, L. (2000). Hypocretin-1 modulates rapid eye movement sleep through activation of locus coeruleus neurons. *Journal of neuroscience*, *20*(20), 7760-7765.

Cooper, P. J., Taylor, M. J., Cooper, Z., & Fairbum, C. G. (1987). The development and validation of the Body Shape Questionnaire. International Journal of eating disorders, 6(4), 485-494.

DeJesus, R. S., Breitkopf, C. R., Ebbert, J. O., Rutten, L. J. F., Jacobson, R. M., Jacobson, D. J., ... & Sauver, J. S. (2016). Associations between anxiety disorder diagnoses and body mass index differ by age, sex and race: a population based study. Clinical practice and epidemiology in mental health: CP & EMH, 12, 67-74.

Ford, D. E., & Kamerow, D. B. (1989). Epidemiologic study of sleep disturbances and psychiatric disorders: an opportunity for prevention?. *Jama*, *262*(11), 1479-1484.

Fox, K. R., & Hillsdon, M. (2007). Physical activity and obesity. *Obesity reviews*, *8*, 115-121.

Fryar, C. D., Carroll, M. D., & Ogden, C. L. (2012). Prevalence of obesity among children and adolescents: United States, trends 1963–1965 through 2009–2010. *National Center for Health Statistics*, *1960*.

Goodwin, J. L., Silva, G. E., Kaemingk, K. L., Sherrill, D. L., Morgan, W. J., & Quan, S. F. (2007). Comparison between reported and recorded total sleep time and sleep latency in 6-to 11-year-old children: the Tucson Children’s Assessment of Sleep Apnea Study (TuCASA). *Sleep and Breathing*, *11*(2), 85-92.

Harvey, A. G. (2008). Sleep and circadian rhythms in bipolar disorder: Seeking synchrony, harmony, and regulation. *American Journal of Psychiatry*, *165*, 820-829.

Hasler, G., Buysse, D. J., Gamma, A., Ajdacic, V., Eich, D., Rössler, W., & Angst, J. (2005). Excessive daytime sleepiness in young adults: a 20-year prospective community study. *The Journal of clinical psychiatry*, *66*(4), 521-529.

Hussain, S., Batool, I., Khan, F., & Bajwa, R. S. (2017). Self Concept and Social Anxiety among Male and Female Juvenile Delinquents. Pakistan Journal of Life & Social Sciences, 15(1), 18-23.

Jansen, A., Vanreyten, A., van Balveren, T., Roefs, A., Nederkoorn, C., &Havermans, R. (2008). Negative affect and cue-induced overeating in non-eating disordered obesity.*Appetite, 51*, 556-562.

Koren, D., O’Sullivan, K. L., & Mokhlesi, B. (2015). Metabolic and glycemic sequelae of sleep disturbances in children and adults. *Current diabetes reports*, 15(1), 562.

Leger, D. (2000). Public health and insomnia: economic impact. *Sleep*, *23*, S69-76.

Mantz, J., Muzet, A., & Winter, A. S. (2000). The characteristics of sleep-wake rhythm in adolescents aged 15-20 years. A survey made at school during ten consecutive days. *Archives de pediatrie: organe officiel de la Societe francaise de pediatrie*, *7*(3), 256-262.

Manzoor, I., and Batool, I (2018) Relationship of Metacognitive Beliefs and Emotional Eating: Exploration of role of Stress and Mindfulness as a Moderator and Mediator (unpublished Dissertation). Department of Applied Psychology, Bahauddin Zakariya University, Pakistan.

Mattick & Clarke (1998) Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy. 36(4), 455-470.*

Papadopoulos, S., & Brennan, L. (2015). Correlates of weight stigma in adults with overweight and obesity: a systematic literature review. Obesity, 23(9), 1743-1760.

Pedro, T. M., Micklesfield, L. K., Kahn, K., Tollman, S. M., Pettifor, J. M., & Norris, S. A. (2016). Body image satisfaction, eating attitudes and perceptions of female body silhouettes in rural South African adolescents. *PLoS One, 11(5),* 1-13.

Reynolds, J.C., &Yanovski, J.A. (2006).A prospective study of psychological predictors of body fat gain among children at high risk for adult obesity. *Pediatrics, 117*(4), 1203-1209.

Rofey, D.L, Kolko, R.P., Iosif, A., Silk, J.S., Bost, J.E., Feng, W., Szigethy, E.M., Noll, R.B., Ryan, N.D., & Dahl, R.E. (2009). A longitudinal study of childhood depression and anxiety in relation to weight gain. *Child Psychiatry and Human Development, 40*(4), 517-526.

Roth, T., & Roehrs, T. (2003). Insomnia: epidemiology, characteristics, and consequences. *Clinical cornerstone*, *5*(3), 5-15.

Sbarra, D. A., & Allen, J. J. (2009). Decomposing depression: On the prospective and reciprocal dynamics of mood and sleep disturbances. *Journal of Abnormal Psychology*, *118*(1), 171-182.

Schneier, F. R., Liebowitz, M. R., Garfinkel, R., Campeas, R., Fallon, B., Gitow, A., & Street, L. (1994). Disability in work and social functioning and social phobia. *Journal of Clinical Psychiatry*, *55*, 322-331.

Schwartz, M. B., & Brownell, K. D. (2004). Obesity and body image. *Body image*, 1(1), 43-56.

Shahid, A., Wilkinson, K., Marcu, S., & Shapiro, C. M. (Eds.). (2012). STOP, THAT and one hundred other sleep scales. Springer Science & Business Media.

Siegel, J. M. (2005). Clues to the functions of mammalian sleep. *Nature, 437*, 1264-1271.

Stein, M. B., Chartier, M., & Walker, J. R. (1993). Sleep in non-depressed patients with panic disorder: I. Systematic assessment of subjective sleep quality and sleep disturbance. *Sleep, 16*, 724-726.

Voelker, D. K., Reel, J. J., & Greenleaf, C. (2015). Weight status and body image perceptions in adolescents: current perspectives. *Adolescent health, medicine and therapeutics, 6*, 149–158

Walker, M. P. & Van der Helm, E. (2009).Overnight therapy? The role of sleep in emotional brain processing. *Psychological Bulletin*, *5*, 731-748.

Wolfson, A. R., & Carskadon, M. A. (1998). Sleep schedules and daytime functioning in adolescents. *Child development*, 875-887.

Wurtman, R. J., & Wurtman, J. J. (1995). Brain serotonin, carbohydrate‐craving, obesity and depression. *Obesity research*, *3*(S4), 477S-480S.