

**Thought Suppression, Sleep Quality and Cognitive Failures  
Among University Students**



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## Certificate

This is to certify that M.Sc. research report on “**Thought Suppression, Sleep Quality and Cognitive Failures among University Students**” prepared by Anum Zafar Raja has been approved for submission to Quaid-i-Azam University, Islamabad.



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## Abstract

The present study aimed to explore the relationship between thought suppression, sleep quality, and cognitive failures among university students. It was also intended to determine the demographic variables in relation to the study variables. Sample comprise of university students from private and government sectors of Islamabad and Rawalpindi ( $N = 505$ ), which included male students ( $n = 196$ ) and female students ( $n = 309$ ). The construct were assessed by White Bear Suppression Inventory (Wegner & Zanakos, 1994), Pittsburg Sleep Quality Index (Busses et al., 1988) and Cognitive failure Questionnaire (Broadbent et al., 1982). Correlation analysis indicated positive correlation between thought suppression, sleep quality, and cognitive failures. With respect to age, findings revealed that individuals in early adulthood score significantly higher on thought suppression. Results also indicated that graduate students and post graduate students scored higher on thought suppression.

# **INTRODUCTION**

## Introduction

People often try to control their thoughts in the hope that they will therefore be able to control their emotions, behaviors, or performances. It is clear from everyday life that the control of mental activity meets with some success that people can sometimes concentrate or study at will and they can sometimes eliminate bothersome worries from mind. Suppression of a thought is never easy; also one might come to a decision to suppress unnecessary thoughts no matter what difficulty this alternative might bring. Normally, suppressing thoughts is a common form of mental control. In accordance to this, it is observed that it can be productive and can help that particular mind state which one is trying to escape. It is certain of those disturbing thoughts that with bleak accuracy mental clockwork proceeds such thoughts back to mind each time one tries to hold them back. As to these consequences, it is alluring to attribute particular importance or control to suppress thoughts to observe these thoughts as disturbed mechanism of mind (Najmi, Wegner, & Nock , 2007).

People can sometimes relax, get aroused or get in a better mood but they may even seem to reduce their thoughts of food during a diet or of cigarettes while trying to quit smoking. And people who are grieving over a loss sometimes conclude that their eventual recovery was the result of putting the loss out of mind. Within a certain range of everyday uses, then, people can exercise some mental control. It also led Jones (as cited in Wenzlaff & Wegner, 2000) to study the nature of the thoughts that can be excluded from consciousness. Wenzlaff and Wegner explained this phenomenon as it possibly is not useful to ascribe importance to unwanted thoughts.

According to Wegner & Erber (1992) initially the interplay of two processes is accountable for this outcome i.e. the operating process and the monitoring process. One is a conscious operating process that is used for mental deflection by focusing on content other than the objective thought, in order to check whether the operating process requires greater cognitive capacity and that the control for unnecessary thoughts or intrusions are desirable or not.

With great freedom, messy lifestyle, dormitory living, changeable schedules, frequent deadlines, self-responsibility, social and educational obligations, university life is accompanied by many demanding challenges. Students willingly modify their sleeping habits in order to cope with these challenges. According to Trockel, Bames, and Egget (2000), it was noticed that students experiencing sleep deprivation mostly try to stay away from more complicated tasks, whereas, Friedman, et al. (2003) explored that poor sleepers often are not aware about the difficulties they are experiencing in their academics that can directly linked to their poor sleep quality and by finding those with a lower cognitive ability getting better scores on a test than them may become depressed. Explaining the fact about why people are clueless and puzzled about their results (Pilcher, 1997).

### **Thought Suppression**

Thought suppression is a type of motivated forgetting when an individual consciously attempts to stop thinking about a particular thought (Anderson & Huddleston, 2012). Thought suppression is a form of mental control which is counterproductive and helps the very state of mind one is trying to avoid (Wegner, Erber, & Zanakos, 1993). Freud is to blame for both, what is known and not known regarding thought suppression by initiating the study of repression. Repression involves placing uncomfortable thoughts in relatively inaccessible areas of the subconscious mind. Thus, when things occur that one is unable to cope with, one might push them away, either planning to deal with them at another time or hoping that they will fade away on their own accord. Currently, repression is the expression for unplanned unaware forgetting whereas; suppression is defined as the planned and conscious exclusion of thoughts from the conscious consideration (Purdon & Clark, 2001). One does not commonly experience forgetfulness for unwanted thoughts but, in everyday life conscious struggle may be undertaken frequently against those unwanted thoughts by hoping these thoughts can be set aside from more conscious awareness. Conscious efforts to suppress the unwanted thoughts are reported by normal individuals as well as those who are suffering from different problems i.e. depression, anxiety, worry, OCD, PTSD and addiction etc (Sullivan, Rouse, Bishop, & Johnston, (1997).

Thought suppression provokes while one's situation prompts the inhibition thinking of various unnecessary thoughts. In general, the external thought which one tries to prevent are usually expressed in the form of communications, actions or emotions. Thought suppression also has the capability to change human behavior. Macrae, Bodenhausen, Milne, and Jetten (1994), found that when people were asked not to think about the stereotypes of a certain group (e.g. a "skinhead"), their written descriptions about a group member's typical day contained less stereotypical thoughts. Either way, thought suppression is attempted as a preventive policy intended to inhibit the explicit psychological consequences of the thought. By this, one may perceive that the thoughts can shortly lead to performing and so one may try to prevent the course by stopping these thoughts of action (Najmi, Reese, Wilhelm, Fama, Beck, & Wegner, 2010).

The studies of hyperaccessibility showed that suppressed thoughts became more accessible to consciousness if, during suppression, there is too much effort being exerted by the working memory. It would explain why one might blurt out the exact word they are trying not to think about and also might attend to that aspect of incentive they're trying to avoid and hoped not to consign to the memory (Klein, 2007; Wegner & Erskine, 2003). Thought suppression might get the mind busy with an exclusive form of commotion. One's concentration rushes in turn from a controlled inquiry for the distraction and then to an anxious recognition that the thought is returned and repeat this ritual over and over again as long as suppression is continued (Wegner, Ansfield, & Pilloff, 1998).

. Previous researches suggested that the consequences might come up with the post suppression rebound of the unwanted thought. Suppression of thoughts brings many other things to mind other than the suppressed thought. The individual's attempt for finding distractor thoughts is usually unfocused, thus the person might shift from one distracter to another, since each fails to preserve the unwanted thought out of the mind (Purdon & Clark, 2001; Trinder & Salkovskis, 1994).

People sometimes experience thoughts that appear out of the blue. These thoughts plague the consciousness and therefore can result as intrusions, where some of the intrusions are harmless because of their content that might be neutral and pleasing, for example, psychologically rehearsing the attractive melodies as well as

natural memories of pleasing events. However, further intrusive thoughts can be distressing as of their distasteful content, for example, unintentional hostile, sexual fantasies and uncertainties about everything. These sort of unpleasant thoughts are perhaps unwanted (Wegner, 2009). One of the ways to deal with these unwanted intrusive thoughts is to attempt to hold them back (Lepore, Silver, Wortman, & Wayment, 1996). On the other hand, suppression of these intrusive thoughts may seem hard sometimes, even impossible, for example, it is hard to not think about the current problems and it is difficult to exile a disturbing sexual thought as well as it can be difficult to suppress a burst of laughter sometimes (Johnston, Hudson, & Ward, 1997). Obsessing about the past can be mentally draining, so instead of imagining what could have happen sometimes one may just try not to think about it at all (Lavender, Jardin, & Anderson, 2009).

Everyone sometimes experiences unwanted intrusive thoughts, which have the potential to interfere with and to undermine goal-directed thinking and behavior. In coping with these unwanted thoughts, people usually try not to think about them, defining a process that has been called thought suppression (Wegner & Zanakos, 1994). Although thought suppression can be considered a form of thought control, it is not always and not uniformly efficient for everybody (Najmi et al., 2007).

Thought suppression is linked with emotional reactivity (Wegner & Zanakos, 1994) and those who are very much emotionally reactive may experience many aversive emotions, thoughts as well as high suppression of negative thoughts (Najmi et al., 2007). Thought suppression is a type of empirical escaping (Chapman, Gratz, & Brown, 2005). Empirical escaping refers to a person that refuses to accept the unpleasant experiences (Lavender et al., 2009). However, Oliver & Huon (2001) explained that in the beginning Wegner instructed individuals to not think about a specific thought but individuals thought about that thought more often. Consequently, there might be the opposite effects of what a person means for it to. Especially for those are low disinhibitors that means they are not good at suppressing the thoughts, whereas, high disinhibitors were capable of suppressing their thoughts, but they also experience negative consequences i.e. anxiety.

People frequently bond in unplanned self-distraction strategy while they are confronted with irresistible negative emotion (Najmi et al., 2007; Wenzlaff, 2005).



Typically once people's effort fully suppress thoughts, they tend to use an unfocused distraction strategy that is the use of numerous distracters rather than only one focus, and also experience a rebound of those suppressed thoughts (Wegner, Erber, & Raymond, 1991).

### **Theoretical Framework**

Numerous theoretical perspectives are related to understanding the contradictory effects of thought suppression.

**Ironic process theory.** The Theory of Ironic Processes (Szasc, 2009) states that thought suppression involves two mechanisms; a purposeful operating process that try to find thoughts that will promote the ideal state i.e., anything other than the unwanted thought. And an ironic monitoring process that remains in the background of consciousness and searches for mental contents that signal the failure to achieve the desired state i.e., the unwanted thought. The operating process is effortful and conscious, whereas the monitoring system is usually unconscious and less demanding of mental effort. The monitoring process is ironic in a sense that it opposes the overall goal of suppression by remaining vigilant for occurrences of the unwanted item. Despite its ironic nature, this vigilance is necessary for successful mental control because it alerts the operating process of the need to renew distraction when conscious awareness of unwanted thought becomes imminent. When the intention to suppress is terminated, or compromised by competing demands on cognitive resources, monitoring processes increase the likelihood that the target of suppression will intrude into consciousness (Wegner, 1994). Several investigations have shown that, when individuals suppress thoughts about a particular target, they experience a higher frequency of thought intrusions than individuals who do not engage in thought suppression. A number of investigations have also provided evidence of a rebound effect, where cessation of suppression results in a marked increase in the frequency of thought intrusions (Szasc, 2009)

The ironic sensitivity provided by the monitoring process normally exerts only a minor effect over conscious awareness, subtly alerting the operating system of deviations from its intended mental course. However, when the operating process is voluntarily terminated by the individual or disrupted by cognitive demands, the

monitoring process continues its attentiveness for unwanted thoughts. Once initiated, then, the monitoring process can linger after effortful distraction has abated, thereby improving the mind's sensitivity to unwanted material. This can explain both the occurrence of post suppression rebound and the ironic effects of cognitive demands during thought suppression. The ironic process theory thus accounts for several features of thought suppression. The theory, however, is not specific regarding if and when the monitoring process ceases its search for occurrences of the target thought. This issue is relevant to questions concerning cumulative impact of repeated suppression attempts and the role of practice in the mental-control process (Zhang & Hunt, 2008).

**Distracter association's theory.** The wide assortments of bits and pieces are suggested that the distraction goal was continuously changing during thought suppression. This depiction that emerged from a study of the thought protocols was that participants were relying on cues in the abrupt situation for distraction. Most of them are very much reachable distractions for example, the chair, the person's attire, etc. Though, they did not force persistent attention and permitted the awareness to flow back to the suppression target. The effect of this nonspecific sequence of self-distraction is with the intention of it to create links among the unwanted thought and a variety of distracters. While suppression is eventually relinquished as the items before used as distracters develop into reminders of the suppression target, thus, formed the rebound effect. Studies have showed that the rebound effect is attenuated by either the use of a single distracter during suppression (Wegner, Schneider, Carter, & White, 1987)

**Goal interruption theory.** Martin, Benzer, Rudnicka, and Miller (1993) propose that the post suppression rebound of target thoughts stems from the motivation to fulfill a blocked goal. Spence (1944) found participants were most apt to recall an experimental task if they had not completed it because of an interruption. Similar results have been obtained by other research (Purdon, 1999) and taken as evidence that thoughts related to an incomplete task remain active in the person's cognitive system. From this perspective, if a person is unsuccessful in accomplishing the goal of suppressing a thought, it should make the target thought especially compelling. Martin et al. (1993) argued that the objective is naturally unfulfilled since

intermittent intrusions are apt to happen during suppression. If a person, later on relinquishes active suppression efforts, the remaining memory of those intermittent failures fosters an obsession with suppression-relevant thoughts. In support of the current context, Purdon (1999) described a study in which they inculcated participants to suppress and monitor specific thoughts preceding towards word recognition assignment. Experimenter gave victory feedback in an effort to promote a sense of conclusion to half of the suppression participants before the task. Thus, provided the support intended for the goal-interruption understanding. The results indicated that the success feedback eliminated the rebound effect (Markowitz & Purdon, 2008)

Although Martin et al. (1993) believe that this formulation can help in explaining some of the paradoxical effects of suppression; they also acknowledge its limitations. For example, a goal-completion motive cannot explain the effects involving suppression rebound (Wegner et al., 1991). It also has difficulty explaining both the attenuating effects of focused self-distraction and the intrusion-promoting effects of cognitive load. Moreover, the theory is unable to account for the return of intrusive thoughts during suppression (Erber & Wegner, 1996).

Beliefs, expectations, and judgments about our own mental processes and products may contribute in important ways to the effectiveness of thought suppression. These metacognitions (Purdon & Clark, 2000) arise during cognitive development, as people accrue an understanding of the contents and processes of mind. The sense that some thoughts or mental states are controllable whereas others are not, for example, unfolds with development, and the idea that it might be difficult to suppress a thought is only achieved with improvement as well (Salkovskis, 1998). Theories of obsession such as those proposed by Salkovskis (1998) argue that intrusive thoughts become obsessions by the virtue of distorted cognitive processes that expand the significance, risk, and personal responsibility associated with unwanted thoughts (Purdon & Clark, 2000). Similar distortions in metacognitive processes have been observed in depressed individuals (Purdon & Clark, 1999) and chronic worriers and in those with phobias (Thorpe & Salkovskis, 1995).

Although metacognitions may not produce the ironic effects associated with thought suppression, they probably help perpetuate attempts at mental control. For example, people can become extremely self-critical and alarmed by their unsuccessful

thought-suppression attempts if they have unrealistically high expectations regarding their mental-control abilities or if they tend to magnify the significance of unwanted thoughts (Kelly & Kahn, 1994). The subsequent distress could rob them of adequate cognitive resources, thereby further decline in their mental-control efforts, setting into motion a downward spiral of mental-control failures. Eventually, this state of affairs would wear down the sense of personal control and contribute to anxiety, despondency, and hopelessness (Wenzlaff & Wegner, 2000)

### **Sleep Quality**

Adequate sleep is a critical factor for health and for health-related behaviors. Humans spend almost a third of their lifetimes sleeping; quality sleep is essential to human health. Sleep is a state of unconsciousness from which one can be aroused. More than a periodic rest condition for the body and nervous system, it is a phase during which the body and nervous system can recuperate. Particularly, protein synthesis is more active during sleep than during waking hours (Chen, Wang, & Jeng, 2006). Studies have shown that the average amount of sleep per night for pre-adolescents, mid-adolescents and old-adolescents was 7 to 10 hours, respectively (Chen et al., 2006; Kahn et al., 2002).

Most research has proposed that adolescents require at least 6–8 hours of sleep each night (Chen et al., 2006; Hughes & Rogers, 2004). Amount of sleep is an important indicator of health and well-being in children and adolescents. In adolescents, sleep influences physical and emotional well-being (brain maturation, substantial biological and psychosocial changes in puberty, and the interaction between physical and psychosocial domains (Chen et al., 2006; Dahl & Lewin, 2002; Redeker, Ruggiero, & Hedges, 2004). Few studies also have focused on the association between healthy sleep behavior and daytime lethargy amongst children (Trockel et al., 2000), whereas there are studies where the main focuses were on topics associated to sleep pattern disturbance during hospitalization (Giannotti, Cortesi, Sebastiani, & Ottaviano, 2002; Redeker et al., 2004) which suggested the association among sleep and accidents. Sleep has become an imperative problem and sleep-related variables like sleep deficit, sleep quality and sleep habits revealed to manipulate performance of employees and students (Rosekind et al., 2010).

According to Hyppa and Kronholm (1989), better sleep quality is associated with a wide range of positive consequences such as, greater wellbeing, less daytime sleepiness, better health and better psychological functioning, whereas it has been confirmed that sleep quality is a compound expression that is challenging in defining and sleep quality makes people feel sleepy in daytime as well as probable risk factor meant for Alzheimer's syndrome (Slats, Claassen, Verbeek, & Overeem, 2013). Researchers have explored the association among sleep deprivation which is loss of sleep and task performance and individual competence (Lustig et al., 2003). According to a study, sleep-deprived students performed poorer on problem-solving, attention tasks and memory. This unfortunately affected their intellectual performance (Curcio, Ferrara, & Gennaro, 2006). On the other hand, some of the researches have focused on the effects of sleep as it is related to job performance.

Pilcher and Walters (1997) observed the reasons of sleep deprivation on cognitive performance among college students. Curcio et al. (2006) reviewed approximately 103 researches associated with academia, learning capability, and sleep loss. Researcher showed that by depriving of sleep, the college students increase their feelings of sleepiness during the day, as well as decrease their ability of attention in class, and also undesirably affecting their ability to perform on assessments.

The effect of sleep deprivation on psychological variables associated with performance, such as self-reported guesses of performance, effort, and attention, have not been carefully investigated. Few studies have examined perceived performance and effort. The results from those studies have often been contradictory. For example, some researchers have suggested that sleep deprivation may affect the willingness of the individual to put forth the effort to perform well on a task more than the actual ability of the individual to perform better (Halbach, Spann & Egan, 2003). Similarly, it has been also concluded that participants possibly will be familiar with their decreased performance levels subsequent to sleep deprivation and also effort to conquer this reduction by escalating their effort (Pilcher & Walters, 1997). People perception of their sleep quality is a motivating factor for insomniac patients to seek treatment. Subjective sleep complaints provide useful health information regarding cognitive aging problems observed in normal aging and also are predictive of future cognitive decline (Nebes, Buysse, Halligan, Houck, & Monk 2009). A person's belief

is the most influential among all psychological attributes that may affect a person's behavior. Bastien et al. (2003) proposed that the impression of having slept well is related to better daytime functioning even after a night of inadequate sleep.

Sleep deprivation can have severe side effects on unusual processes in our body like with endocrine system, the metabolism, the immune system and also the cardiovascular activities. These effects depend on how accurate the sleep deprivation is (Buboltz Jr, Soper, Brown, & Jenkins, 2002; Teter, McCabe, LaGrange, Cranford, & Boyd, 2006). Similarly distorted patterns of appetite-regulating hormones such as decreased leptin and increased ghrelin secretion can be pragmatic which in turn increase one's appetite that might endorse weight gain and obesity (Banks, 2007).

Chronic sleep deprivation has also been associated with alteration of immune system function, the potential consequences being increased susceptibility to illness due to impaired host defenses (Smith & Lapp, 1991) and activation of systemic inflammatory immune responses involved in pathogenesis of insulin resistance and cardiovascular disease (Banks, 2007).

The underlying causes for the poor sleep quality and quantity in university students may be complex and multi-factorial. Individual factors such as poor sleep hygiene practice associated with inadequate sleep knowledge could lead to reduced sleep quality in university students (Kabrita, Hajjar-Muça, & Duffy, 2014). Moreover, inappropriate naps in the evening or irregular naps might be the contributing factors for the delay in bedtime, sleep loss, and impairment of daytime functioning in students. External factors including the early starting time of morning classes were associated with shorter sleep length on weekdays and compensatory sleep during weekends (Kang & Chen, 2009; Peach, Gaultney, & Gray, 2016).

Sleep deficiency to less than six to seven hours per day can lead to severe destruction of cognitive and psychomotor functioning that reduces attentiveness, thinking strategies, daytime dysfunction, frequent occurrence of sleep related accidents and memory disturbances (Banks, 2007; Teter, 2006). The consequential diminished academic motivation often results in poor grades (Smith, Carrington, & Tinder, 2005; Teter, McCabe, LaGrange, Cranford, & Boyd 2006; Tsai & Li, 2004).

Poor sleep quality of students can have many mental as well as physiological consequences. Those students who are getting less sleep comprise of one or two hours of propensity to accumulate a sleep obligation which leads to unnecessary daytime sleepiness. The consequences of sleep problems such as deficient sleep and poor sleep quality among university students could be serious (Smith, Nixon, & Nader, 2004). Insufficient sleep was suggested as a risk factor for minor psychiatric disorders, lower life satisfaction, academic deterioration, and detrimental changes in carbohydrate metabolism and obesity. Sleep quality was as important as sleep quantity in affecting students' daytime sleepiness and general health. Decreased sleep quality has been linked to a variety of mental and physical problems, including the feelings of depression, anxiety, and fatigue. As a result, there is a growing concern about university students' sleep habits and problems especially in relation to their health and wellbeing (Teter et al., 2006; Voelker, 2004). Sleep disturbances are amongst the most prevalent health complaints in late adolescents and young adults, with students reporting insufficient sleep and difficulties with falling asleep or maintaining sleep (Yang et al., 2003). Previous researches consistently demonstrated that sleep patterns, along with other students practices such as high media usage, contribute significantly to poor sleep hygiene and sleep problems (Tavernier and Willoughby, 2014). Another study of Abdulghani et al. (2014) reported that sleep deprivation, homesickness, and stress are important factors for academic success of college students (Amaral et al., 2018). Sleep difficulties are frequent in college students; with over 60% of them having poor sleep quality (Lund et al., 2010) and 1 out of 4 being at risk for at least one sleep disorder (Gaultney et al, 2010)

### **Theories of Sleep**

Mechanism of sleep is explained by different theories like Repair and Restoration Theory, Evolutionary Theory, and Information Consolidation Theory.

**Repair and restoration theory.** According to this theory, sleep controls the activating and renewal of mental and psychological processes that put together the body and healthy mind and keep daily functioning maintained. Repair and Restoration Theory proposed that non-rapid eye movement sleep is essential for rebuilding and of physiological functions, while rapid eye movement sleep is essential in rebuilding of mental functions. Sleep process in body also accelerates its rate protein fusion and cell

distribution, further signifying that repair and restoration happens during sleep (Oswald et al., 1966).

**Evolutionary theory.** Evolutionary hypothesis and adaptive theories of sleep suggests that times of movement and latency developed as a method for saving vitality. As indicated by this hypothesis, all species have adjusted to sleep aid timeframes when attentiveness would be the most hazardous. Bolster originated as of similar research of various species, for examples, bears and lions, normally sleep between twelve to fifteen hours. Again, creatures that have numerous predators have just brief times of sleep, generally getting close to 4 to 5 hours of rest every day (Xie et al., 2013).

**Information consolidation theory of sleep.** This theory of sleep depends on subjective research and proposes that individuals sleep with a specific aim to route information that has been procured amongst the day. Not with tending usage of information from earlier. Some examination likewise recommended that sleep facilitates bonding the things one has learned during the day into long-term memory division. It's further indicated that lack of sleep badly affect the ability to review and recall information (Carpentar & Andrykowski, 1998; Iliescu et al., 2003).

Theories of sleep explain the mechanism through which sleep-wake cycle works and affect physical and psychological health of a person. Harmful effects of poor sleep and deficient sleep can occur suddenly like car accident or it can cause harm through ongoing sleep deficiency like chronic health problems. So the third variable of the study is cognitive failures, one of the negative outcomes of the poor sleep quality (Carpentar & Andrykowski, 1998)

### **Cognitive Failure**

By tradition, the ground of clinical psychology has been concerned with individual differences and psychopathology, whereas, cognitive psychology has been interested in understanding basic cognitive mechanisms. During the past few years a considerable amount of interest has developed in the assessment of minor everyday slips or errors. Cognitive failures are comprised of perceptual, attentional, memory, and action-related mental lapses (Broadbent, Cooper, FitzGerald, & Parkes,



1982). Lapses of awareness tend to be stated as cognitive failures in cognitive psychology and as dissociation in clinical psychology. Naturally the constructs appear to comprise ordinary and overlapping mental phenomenon.

Moreover, it has been declared that cognitive control is associated to different types of attentional and memory processes, and also imagination (Broadbent et al., 1982). In the beginning of 1970s, Reason used the expression absent-mindedness to explain lack of cognitive control, for examples forgetfulness, fantasizing and spacing out. Engrossed in illuminating the difference in human errors whereas; Broadbent et al., (1982) used the term cognitive failures to refer to all different types of errors or lapses such as action, memory, attentional and perceptual.

According to Tipper and Cranston (1985), selective attention model involves active inhibition of unnoticed bits and pieces. Primarily intentions and distracters would be examined in comparable and in numerous cases up to definite levels of demonstration. Commencing this point, the goal would obtain more processing but the distracter would be there vigorously repressed. It must be prominent that this model, even as favoring delayed selection, differs from most late selection models in the condition for vigorous reserve rather than just passive decay of unobserved objects (Ruthruff & Miller, 1995). One might expect to flee from the problem of defensive unwillingness to confess errors previously mentioned.

At all levels of ability, According to Robertson (2003), the lapses of attention are evidently a part of one's life. Some are simply tiresome, such as omitting a familiar turn-off on the highway and some are extremely serious, such as failures of attention that may cause some injury or loss of life and any kinds of accidents. Beyond the obvious costs of accidents arising from lapses in attention, there is personal productivity, efficiency, lost time and quality of life in the lapse and recapture of consciousness and attention to normal tasks. Lapses of attention are also inherently cognitively debilitating. Indeed, individuals for whom intervals between lapses are very short are typically viewed as impaired (James, Jonathan, Carriere, 2006). Given the prevalence of attentional failures in everyday life and the ubiquitous and sometimes disastrous consequences of such failures, it is rather surprising that relatively little work has been done to directly measure individual differences in everyday errors arising from propensities for failures of attention (Robertson, 2003).

**Dimensions of cognitive failures.** Many researchers have looked for cognitive failures which are characterized by minor slips and errors. This construct comprises of more specific factors (Unsworth, Redick, Spillers & Brewer, 2012). There are some dimensions of cognitive failures such as forgetfulness, distractibility, and false triggering (Broadbent et al, 1982).

While working at the biological factors, adding to cognitive failures, some MRI studies have found that more levels of parietal grey matter contributed for more cognitive failures. Another study revealed that low levels of neurotransmitter named as GABA can cause cognitive failures (Kanai, Bahrami, Roylance, & Rees, 2011).

**Relationship with stress.** Cognitive failures lead to increased levels of stress (Broadbent et al, 1982). When cognitive failures occur, they are much associated with increased levels of tension and stress (McVay & Kane, 2009).

**Relationship with attention.** Many researchers have been carried out to investigate the association among cognitive failures with attention and all of them have mixed and a bit different results (Broadbent et al., 1982). Attention had low correlation with cognitive failure (Unsworth et al., 2012).

**Inhibition.** Inhibition is the ability to stop actions that disrupt the behavior leading one towards the desired goal (Aron,2007).These dimensions also have strong levels of negative association with cognitive failures (Roche, Garavan, Foxe, & O'Mara, 2005). There is a strong correlation between these two variables (Berger, 2011). Greater levels of cognitive failures indicate less levels of inhibition in almost all individuals and vice versa.

**Personality and functioning.** Personality has a lot to contribute in cognitive failures. Cognitive failures, at most, are correlated with negative mood (Payne & Schnapp, 2014). Cognitive failures are associated with neuroticism and worries predict cognitive failures (Wilhelm, Witthöft, & Schipolowski, 2010).

**Dissociative experience.** Dissociative experiences are the part of cognitive failures. There is a strong correlation among both of them (Bruce, Ray, & Carlson, 2007).

## Thought Suppression and Sleep Quality

Suppressing unpleasant thoughts can be tempting, as associated negative emotions may be avoided. However, the ironic control theory (Wegner et al., 1987) proposes that thought suppression leads to an increased occurrence of the suppressed content in waking states. Two processes are basically responsible for this consequence i.e. operating process and monitoring process. First, that is operating process, requires better cognitive capacity while the capacity reduced by cognitive demands such as sleep, the operating process is weakened and the unwanted thoughts are more reachable. The monitoring process continues its activity (Kröner-Borowik et al., 2013).

Prior studies on psychology students found that any attempted suppression of unwanted thoughts prior to sleep leads to increased dreaming about that goal that is called dream rebound effect. This implies that ironic control theory might be appropriate to enlighten the occurrence of the bad dreams or the nightmares. The study on psychology students showed that suppression-induced dream rebound prior to sleep that can even is enhanced by cognitive load such as learning a nine-digit number (Bryant, Wyzenbeek, & Weinstein, 2011). According to the ironic control theory, it is suggested that cognitive load weakens the operating process and unwanted thoughts becomes more accessible. The suggestion that thought suppression leads to increased occurrence of the suppressed content in dreams and there is also convergent facts to hold up the dream rebound effect, such as, the patients with insomnia report having insomnia-related dream contents whereas, demanding to suppress uncertainties regarding their sleep quality prior to falling or with those with post-traumatic stress disorder (PTSD) report dreams on their traumatic familiarity (Mellman, Kumar, Kulick-Bell, Kumar, & Nolan, 1995; Phelps et al., 2008) and refraining smokers dream repeatedly of smoking (Hajek & Belcher, 1991; Erskine, Georgiou, & Kvavilashvili, 2010).

According to Robertson, Broomfield, and Espie as cited in Schmidt, Harvey, & Van der Linden (2011) it has been found that poor sleepers are cognitively more provoked at bedtime than normal sleepers are, and that the poor sleepers perceive their racing mind as causally related to their sleep problems. Cognitive accounts of insomnia also generally assume that inadequate emotional processing during the day

will result in a surge of affect-laden concerns during the pre-sleep period, thereby fueling excessive negatively toned cognitive activity (Espie, 2002; Harvey, 2002).

A growing line of research suggests that poor sleepers typically have difficulties relinquishing control when trying to fall asleep (Espie et al., 2006). Specifically, in the face of unwanted mental activity at bedtime, which can take the form of verbal thought or visual imagery, poor sleepers tend to rely on dysfunctional control strategies that maintain cognitive and affective arousal instead of helping them to wind down (Harvey, 2002).

Harvey (2003) found that compared to control participants, people with insomnia reported a greater use of suppression to control their pre-sleep worries. Furthermore, those with insomnia, instructed to suppress worries, reported worse sleep quality and longer sleep onset latency than did those with insomnia in the no-suppression condition. Interesting hidden complications are, although suppression exacerbated sleep disturbance, it did not lead to a rebound of worries. Thus, it may be the case that the effort expended to suppress presleep worries is largely responsible for the worsening of the intrusive thoughts and psychological thinking (Erskine, Kvavilashvili, & Kornbrot, 2007; Najmi, 2009)

There is convergent evidence to support the dream rebound effect and the proposal that thought suppression leads to increased occurrence of the suppressed content in dreams. For example, a person with insomnia will report having insomnia-related dream contents while trying to suppress worries about their sleep quality prior to falling asleep (Jaehne et al., 2012). Previous studies on psychology students found that any attempted suppression of unwanted thoughts prior to sleep leads to increased dreaming about that target the dream rebound effect (Schmidt & Gendolla, 2008).

### **Thought Suppression and Cognitive Failure**

Several studies suggest that thought suppression often results in an increase, rather than a decrease, in unwanted thoughts (Wegner, 1997; Wegner et al., 1987). Research in addictive behaviors has found that thought suppression impedes attempts to quit smoking (Toll, Sobell, Wagner, & Sobell, 2001), and those heavy social drinkers given instructions to suppress alcohol-related thoughts and urges

demonstrated stronger expectancies after alcohol cue exposure when compared to controls (Palfai, Monti, Colby, & Rohsenow, 1997).

Even though there is an increasing literature on the cognitive performance of older people recruited as having chronic insomnia (Haimov, Hanuka, & Horowitz, 2008). Furthermore, many of the studies investigating the relationship among the sleep quality and cognitive performance do not control the circumstances that are identified to impair sleep and cognition. Such conditions could confound any conclusions drawn about the role that sleep disruption plays in the magnitude of the cognitive decrements associated with normal aging (Mallon, Broman, & Hetta, 2002).

A prominent view as to the cause of the relationship between stress and cognition has revolved around stress-related intrusive thoughts and avoidance (Klein & Boals, 2001). The perception that one's life is unpredictable, uncontrollable, and overloaded (referred to as perceived stress) can result in intrusive thoughts, which in turn are believed to compete for limited cognitive resources. The tendency to experience intrusive thoughts is related to poor cognitive control (Verwoerd & Wessel, 2007). The propensity to occurrence of intrusive thoughts is associated with poor cognitive control. Wegner (1994) explained that intrusive thoughts are hard to suppress and any attempts to perform so might result in extra cognitive decrements.

Additionally, Klein and Boals (2001) demonstrated that experimentally induced reductions in the occurrence of intrusive thoughts lead to better subsequent cognitive functioning, including working-memory capacity and academic performance. Perceived stress is not the only possible source of intrusive thoughts. Another prominent source of intrusive thoughts is the occurrence of a stressful or traumatic experience. Such events can shatter one's view of the self and others, resulting in a period of time of oscillation between intrusive thoughts and avoidance (Lagana & Reger, 2009), which comprise the core symptoms of posttraumatic stress disorder (PTSD). This oscillation continues as the individual attempts to reconcile their shattered views and integrate the stressful experience into existing schemas and views of the self and the world.

The experiencing of intrusive thoughts and avoidance in the aftermath of stressful events is considered a normal part of the coping process. If these two sources

of intrusive thoughts (intrusive thoughts about a stressful event and perceived stress) are both capable of producing impairments in cognitive performance, then we might expect an interaction between these two types of stress and cognitive performance. When either intrusive thoughts about a distressing event or perceived stress is elevated, we would expect decrements in cognitive performance. However, when these two types of stress are relatively low, we would expect to see relatively better cognitive performance since there are presumably fewer intrusive thoughts to impede cognitive resources. Certainly, the stressful events and cognitive performances have been found to have differential effects on physical health (Lagana & Reger, 2009).

Broadbent et al. (1982) explained that everyday cognitive functioning includes everyday slips and errors correlated to attention and memory such as forgetting daily activities, sometimes forgetting names of people whom one meet on daily basis and failing to note traffic signs etc. These errors are frequently referred to as everyday cognitive failures and are measured via Cognitive Failures Questionnaire (CFQ). Numerous studies comprise affiliation among stress and everyday cognitive failures (Fisher & Reason, 1988). For illustration, the greater levels of employee that suffer exhaustion were found to be interrelated to greater frequencies of cognitive failures (Linden, Keijsers, Eling, & Schaijk, 2005). Furthermore, in the study of Persian Gulf War, veterans reported a greater frequency of everyday cognitive failures and in contrast to a non-deployed military sample (David et al., 2002). Boals (2008) found that higher rates of PTSD symptoms in a sample of holocaust survivors were associated to higher rates of everyday cognitive failures.

### **Sleep Quality and Cognitive Failures**

Ardila (2007) explained that although cognitive performance declines with a growing age in a range of domains commencing intelligence to the attention and there might be significant individual inconsistency in the extent of these age-associated cognitive decrements. A probable contributor to individual inconsistency in the age-associated cognitive impairment has a further functional basis together with the timing and quality of sleep. Studies using experimental sleep limitation and sleep deprivation have renowned dose-related cognitive impairments even in the young adults (Van Dongen, Maislin, Mullington, & Dinges, 2003). Bonnet (2011) as cited in Scullin and Bliwise (2015) suggested that it is of certain interest of psychological

scientists that the role of sleep in cognitive functioning is sleep loss and has long been recognized to impair performance on attention and executive-control tasks. Another possibility is that normal sleep might actively promote memory stabilization and integration. Various elderly individuals report chronic troubles with sleep onset and sleep duration along with maintenance and with allied unpleasant daytime consequences such as drowsiness, falls, and the functional disability (Buysse et al., 1991; Van Frago, & Gill, 2007). There are also verifications, primarily in younger adults that poor subjective sleep quality as seen in insomnia might also be linked with cognitive impairments (Fulda & Schulz, 2001).

It has been argued that sleep quality affects the execution of the prefrontal cortex of the brain which is connected to the cognitive actions, such as creativity, assimilation and preparation (Cursio et al., 2006). In addition, Wilkerson Boals, and Taylor (2012) examined the association of insomnia along with everyday cognitive failures in a large sample of young adults i.e. college students and suggested that insomnia and poor sleep quality were connected particularly with cognitive failures associated to distractibility, blunders and poor memory for names. Interestingly, Stickgold, Scott, Rittenhouse, and Hobson, (2007) suggested that sleep quality affects the new learning process, which relates to the capability of brain to accumulate new learned tasks to long-term memory and consequently leads to everyday cognitive failures (Gaultney, 2010).

Preceding studies on psychology students found that any attempted control of unwanted thoughts prior to sleep directed towards amplified dreaming regarding to the target which is said to be dream rebound effect (Schmidt & Gendolla, 2008; Taylor & Bryant, 2007). Sleep difficulties have been found to be related with poorer cognitive function and poor sleep quality is also a characteristic of dementia (Van Dongen, Baynard, Maislin, & Dinges, 2004; Durmer & Dinges, 2005). It has been also discovered that generally performance declines as a function of time that is spent awake by circadian rhythm. Also poor sleep quality is linked with reduced performance in the exam requiring concentration or executive functioning as well as for memory. Association between quality of sleep and cognitive impairment has been found in variety of samples together with healthy adults (Dongen & Dinges, 2005; Ratcliff & Dongen, 2009).

Deprived sleepers usually have difficulties relinquishing control while trying to fall asleep (Espie et al., 2006). Particularly, while the unwanted mental activity started before bedtime that be able to take the form of verbal thought or visual imagery (Harvey, 2000). Another study has found that concerns before sleep is related with an increased possibility of developing a cognitive impairment. Lack of Sleep induces an extensive series of effects on cognitive functions, even though the cognitive errands differ broadly in their sensitivity to sleep loss. Generally, despite of the task, the cognitive performance becomes increasingly worse when time on task is extended. This is the classic exhaustion consequence that is exacerbated by sleep loss (Goel, Rao, Durmer, & Dinges, 2009).

Abramowitz, Tolin, and Street (2001) conducted a meta-analysis of thought suppression experiments where they restricted their investigation to studies that comprised at least one no-suppression control situation. Although this and other additional criterion, their ultimate analysis pertained to no less than twenty eight suppression experiments, demonstrating that the original study by Wegner and colleagues (1987) has had quite a spin-off along with the one that can certainly speak of a standard. Initially Abramowitz et al. (2001) tried to answer whether suppression leads to a boost of target thoughts.

### **Researches from Pakistan**

In Pakistan, Munir (2002) studied thought suppression with creativity among university students in which she find out the higher prevalence of thought suppression in university students with high acceptability level by showing no variations in creativity with variation in thought suppression. Nawaz (2016), studied sleep quality with brooding rumination and reflective rumination, depression and sleep quality among university students where it was found that brooding rumination and reflective rumination leads to the increase predictability of depression and they influence the thought patterns and increase the chances to diagnosis of depression. Neelam (2012), studied sleep quality with moods of students in which she studied different moods of the students and sleep quality and establish a positive association between mood dimensions and quality of sleep of a student. Rahat (2017) studied cognitive failures with the role of perfectionism and rumination among women in which nonworking women and women living in joint family system tend to have more failures also the



tendencies of false triggering were observed more among matric and graduate females and recommended to explore cognitive failures further.

### **Rationale of Study**

The present study will explore the empirical evidence of thought suppression sleep quality, and cognitive failure among university students. Whether they influence studies, interpersonal relationships, and work demands. Mental presence is of significant importance, if not routine life will be disturbed, the link of thought suppression and sleep quality will decrease one's cognitive efficiency. There is a need to explore more about the relationship of thought suppression, cognitive failures and sleep quality. It is believed that certain factors influence study variables i.e., gender, age, education level, and work status (Loft & Cameron, 2014; Sanz de Acedo Lizárraga, Sanz de Acedo Baquedano, & Elawar, 2007). The aim of this study is to explore gender differences among study variables. It is important to check the influence of suppressing the thoughts on our behavior and daily life performances in different setup and how it can be prevented (Druckman & Bjork, 1994)

The present study sought to test whether using distracters affect the level of sleep quality cognitive failure and thought suppression among university students and to check the performance of students on the basis of their daily life. It is suggested that dysfunctional forms of cognitive controls such as thought suppression are linked with sleep disturbance and it has also been said that dysfunctional affect control, such as problems with down-regulating negative and positive affective states might also related to the sleep disturbance (Schmidt, Harvey, & Van der Linden, 2011).

As it has been observed that on the basis of everyday errors that occur as a result of the mundane lapses of attention that occur when consciousness is absent or, at least, disengaged from ongoing tasks (Kam & Handy, 2013). In Pakistan there are little evidence of studies are found on cognitive failure and thought suppression and since there were very limited local studies that can be found exploring this particular subject of concern in Pakistan.

## **METHOD**

## Method

### Objectives

Following are the research objectives for current study.

1. To determine the relationship between suppression of thoughts and sleep quality with cognitive failures among university students.
2. To determine the role of demographic variables including gender, age, education level, and work status among study variables.

### Hypotheses

The following hypotheses were formulated to achieve objectives of the study.

1. Thought suppression will be negatively related with sleep quality among university students.
2. Thought suppression will be positively related with cognitive failures among university students.
3. Sleep quality will be negatively related with cognitive failures among university students.
4. Female students will have high tendencies for thought suppression and cognitive failures as compared to male university students.
5. Working students will have greater tendencies for thought suppression and cognitive failures as compared to nonworking students.
6. Nonworking students will have greater sleep quality as compared to working students.

### Conceptual and Operational Definitions

Following are the operational definitions for the variables of the study.

**Overall thought suppression.** Thought suppression comprises of three components. These components have been explained below.

***Thought suppression.*** Thought suppression, refers to how a person deals with emotional conflicts, internal or external stressors by intentionally avoiding thinking about disturbing problems, wishes, feelings, or experiences (Rodríguez, Delgado, Rovella & León, 2008). Another definition of thought suppression is “an effort not to think about something in particular and it means intentionally and voluntarily withdrawing attention from a thought, with special emphasis on the goal rather than on the strategies used to achieve it (Wegner & Zanakos, 1994).”

In this study thought suppression was operationalized through scores obtained on thought suppression subscale of White Bear Suppression Inventory (Wegner & Zanakos, 1994). High scores on this subscale indicate more thought suppression and low scores indicate less thought suppression.

***Unwanted intrusive thoughts.*** This factor assesses a series of recurrent thoughts and images that the person cannot avoid and that are difficult to control, so these are called as unwanted intrusive thoughts (Rodríguez et al., 2008).

In this study unwanted intrusive thoughts was operationalized through scores obtained on unwanted intrusive thoughts subscale of White Bear Suppression Inventory (Wegner & Zanakos, 1994). High scores on this subscale indicate more unwanted intrusive thoughts and low scores indicate less of them.

***Self-distractibility.*** It means to avoid negative thoughts. Blumberg (2000) has been conceptualized self-distractibility in terms of Carver, Scheier, and Weintraub's (1989) definition of mental disengagement. This tends to occurs via a wide variety of activities that serve to distract the person from thinking about the behavioral dimension or goal with which the stressor is interfering.

In this study self-distractibility was operationalized through scores obtained on self-distractibility subscale of White Bear Suppression Inventory (Wegner & Zanakos, 1994). High scores on this subscale indicate more distraction and low scores indicate less of them.

***Sleep quality.*** It includes quantitative aspects of sleep, such as duration, sleep latency, or number of arousals as well as more purely subjective aspects, such as

depth or restfulness of sleep. It entails sleep disturbance and usual sleep habits during the prior month only (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989).

In this study sleep quality was operationalized through scores obtained on Pittsburgh Sleep Quality Scale (Buysse et al., 1989). Low scores on this scale indicate more sleep quality and high scores indicate less sleep quality.

**Cognitive failures.** Cognitive failures include attentional, perceptual, memory, and actions related to mental lapses (Broadbent et al., 1982).

In this study cognitive failure was operationalized through scores obtained on Cognitive Failure Questionnaire (Broadbent et al., 1982). High scores on the scale indicate more cognitive failures and low score indicates less of them.

**Forgetfulness.** The common element is that there is a departure from the normal smooth flow of function, and events do not proceed in accordance with intention (Broadbent et al., 1982).

In this study forgetfulness was operationalized through scores obtained on forgetfulness subscale of Cognitive Failure Questionnaire (Broadbent et al., 1982). High scores on the scale indicate greater tendency to forget and vice versa.

**Distractibility.** Distractibility is the tendency being absent minded in social interactions and gatherings (Broadbent et al., 1982).

In this study distractibility was operationalized through scores obtained on distractibility subscale of Cognitive Failure Questionnaire (Broadbent et al., 1982). High scores on the subscale indicates more tendency to distract and vice versa.

**False triggering.** It is the interrupted processing of sequences of cognitive and motor actions. False Triggering may be seen as resulting from loss of activation in attentional resources (Norman & Shallice, 1986).

In this study false triggering was operationalized through scores obtained on false triggering subscale of Cognitive Failure Questionnaire (Broadbent et al., 1982).

High scores on the subscale indicate more tendencies to false triggering and vice versa.

### **Instruments**

Following instruments were utilized to measure the study variables.

**White Bear Suppression Inventory.** In the present study White Bear Suppression Inventory (WBSI) was used that is designed to measure thought suppression and has been developed by Wegner and Zanakos (1994). It is a 15-item scale with three subscales namely, Thought Suppression (item no. 1, 8, 11, and 14), Unwanted Intrusive Thoughts (item no. 2, 3, 4, 5, 6, 7, 9, and 15), and Self-Distractibility (item no. 10, 12, and 13). The scale has five-point Likert rating 1 for (strongly agree) to 5 for (strongly disagree). The total scores are taken by adding all the scores of items. Scores on the total scale have possible range of 15 to 75. Higher scores on WBSI indicate greater tendencies to suppress thoughts. The reliability coefficient of this scale is from .87 to .89 (Blumberg, 2000). The WBSI has also been found to have good stability with a 1 week test-retest correlation of .92 and a 3 week to 3-month test-retest correlation of .69 (Rassin, 2003)

**Pittsburg Sleep Quality Index.** In the present study Pittsburg Sleep Quality Index (PSQI) was used that was developed by Buysse et al. (1989). It is a 19 item scale to assess sleep quality of previous one month and is further grouped into seven components; Subjective Sleep Quality ( $\alpha = .83$ ), Sleep Latency ( $\alpha = .72$ ), Sleep Duration ( $\alpha = .80$ ), habitual sleep efficiency ( $\alpha = .85$ ), sleep disturbance ( $\alpha = .46$ ), Use of Sleep Medication ( $\alpha = .62$ ), and Sleep Daytime Dysfunction ( $\alpha = .63$ ). PSQI has an overall reliability coefficient ( $\alpha = .83$ ), indicating a high degree of internal consistency whereas components scores had coefficient ranging from .84 to .65 for each component, (Buysse et al., 1989) The largest component- total correlation coefficient were found for Habitual Sleep Efficiency and Sleep Quality ( $\alpha = .76$  for each), and smallest correlation coefficient was found for Sleep Disturbance ( $\alpha = .35$ ). Response scale ranges 0 to 3 scale for each item, whereby 0 score indicates no difficulty, while a score of 3 indicated severe difficulty, (Buysse et al., 1989) .Total PSQI score ranged from 0 to 21 as an index of one's overall sleep quality i.e., the higher the score, the poorer the sleep quality.

**Cognitive Failures Questionnaire.** In the present study Cognitive Failures Questionnaire (CFQ) was used that was designed by Broadbent et al. (1982) and three subscales i.e., Forgetfulness (item no. 1, 2, 5, 7, 17, 20, 22, and 23), Distractibility (item no. 8,9,10,11,14,19,21, and 25), and False Triggering (item no. 2, 3, 5, 6, 12, 18, 23, and 24) to assess a person's likelihood of committing an error in completion of an everyday task. It consists of 25 item self-report inventory that inquires about a person's failures in memory, perception, and motor function over the past six months. All questions are worded in the same direction. The response format uses a five-point Likert type scale 0 (never) to 4 (very often). Scores for the CFQ can range from 0 to 100. All items on the CFQ are positively correlated with each other. The reliability coefficient alpha for the CFQ was found to be .91, and the CFQ has a test-retest reliability of .82 over a 2-month interval (Vom Hofe, Mainemarre, & Vannier, 1998). This scale was used due to its due to its easy accessibility and has been consistently used in research on cognitive failures (Bruce, Ray & Carlson, 2007; Elfferich et al., 2010; Hartl, Duffany,; Kingstone, Smilek & Eastwood, 2008; Linden et al., 2005)

### **Sample**

The sample ( $N = 505$ ) of the present study consisted of university students. Data was collected from different departments including social sciences, natural sciences, and biological sciences of both private and government universities namely Quaid-i-Azam University, Bahria University, Arid Agriculture University, Islamabad. Sample consisted of 196 men and 309 women. The age ranged from 17-45 years ( $M = 22.62$ ;  $SD = 3.71$ ). The sample was collected through convenient sampling techniques. Demographic information was acquired with reference to gender, age, education level, work status, traumatic event, and social media usage. The detailed demographic profile is given below.



Table 1

*The Demographics Description of Sample Along with Frequency and Percentage of Main Study (N = 505)*

Demographics		<i>f</i>	%
Gender	Male	196	38.8
	Female	309	61.2
Age	Late adolescents	380	75.2
	Early adulthood	101	20.0
Education	Graduates	223	44.2
	Post graduates	85	16.8
Family structure	Nuclear	337	66.7
	Joint	168	33.3
Marital status	Single	460	86.9
	Married	45	7.3
Work status	Workers	164	32.5
	Non- workers	341	67.5

Table 1 displays frequency and percentages of sample along with gender, age, and years of education, family structure, marital status, work status, and experience of any traumatic event for the sample approached for this study.

### **Procedure**

For the present study students of different universities were approached at their respective institutes. At first, permission was taken from authority. Students from BS, Masters, MPhil, and PhD levels were approached in person or in class settings. Informed consent was taken from every participant and was clarified about the purpose of study. For this purpose a written consent form was also used in addition to verbal willingness. Participants were assured about information data confidentiality and anonymity. The survey booklet comprising of a demographic sheet, White Bear Suppression Inventory, Pittsburg Sleep Quality Index, and Cognitive Failure Questionnaire were handed over to the participants. Instructions were given in both verbal and written form to fill in the questionnaire. They were additionally informed about the privilege to pull back their cooperation if they were not willing or comfortable. At the end institute authorities and study participants were thanked for their support and cooperation.



## **RESULTS**

## Results

The aim of the study was to assess Relationship between Thought Suppression, Sleep Quality and Cognitive Failures. For this purpose analysis of the data was done by using SPSS-21. The *Cronbach's* alpha coefficient for White Bear Suppression Inventory, Pittsburg Sleep Quality Index, and Cognitive Failure Questionnaire were determined to assess the reliability of the scales on the variables of thought suppression, sleep quality, and cognitive failures respectively. To check the normality of data for present study, skewness and kurtosis were computed. To find relationship between thought suppression, sleep quality and cognitive failures correlation coefficient were computed. Independent sample *t*- test and one way *ANOVA* were computed to test the mean differences along the demographic variables.

Table 2

*Alpha Reliabilities and Descriptive Statistics For Study Variables (N = 505)*

Scales	No. of items	$\alpha$	<i>M</i>	<i>SD</i>	Range		Skewness	Kurtosis
					Potential	Actual		
WBSI	15	.92	28.88	17.59	15-75	15-73	.35	-.38
TS	4	.75	7.76	4.99	1-20	4-20	.41	.35
UI	8	.87	15.20	9.66	1-40	8-40	.35	-.46
SD	3	.76	7.64	4.85	1-15	3-15	.13	-.78
PSQI	12	.74	9.49	3.76	0-36	1-20	.11	-.65
CFQ	24	.90	43.69	20.32	0-100	7-100	-.39	-.25
F	8	.70	13.32	5.83	0-32	1-32	-.37	.11
D	8	.72	12.18	5.90	0-32	2-32	-.25	-.25
FT	8	.79	13.77	6.69	0-32	0-32	-.47	-.47

*Note.* WBSI = White Bear Suppression Inventory; TS = Thought Suppression; UI = Unwanted Intrusive Thoughts; SD = Self-Distractibility; PSQI = Pittsburg Sleep Quality Index; SQ = Sleep Quality; SL = Sleep Latency; SD = Sleep Duration; SE = Sleep Efficiency; SDI = Sleep Disturbance; SM = Use of Sleep Medication; SDD = Sleep Daytime Dysfunction; CFQ = Cognitive Failure Questionnaire; F = Forgetfulness; D = Distractibility; FT = False Triggering.

Table 2 shows alpha reliability of the scales. The alpha reliability of White Bear Suppression Inventory  $\alpha = .95$ , Pittsburg Sleep Quality Index  $\alpha = .74$ , and Cognitive Failure Questionnaire  $\alpha = .90$ , thus indicating stable reliability and acceptable to good internal consistency of the scales (George & Mallery, 2003). The value of mean on each scale represents the participant's average scores. The value of standard deviation indicates that responses are scattered from mean to each variable. The skewness value of all the scales and subscales is less than 1 and negative that indicates the lower values are present, tail is towards the left side and distribution lies within normality. Similarly negative values of kurtosis reveal that the distribution curve is flat and heavily tailed that indicates the sample scores have variety of features evenly distribution (Kim, 2013).

Table 3

*Correlation Matrix For on Study Variables (N = 505)*

Scales	WBSI	TS	UI	SD	PSQI	SQ	SL	SD	SE	SDI	SM	SDD	CF	F	D	FT
WBSI	-	.91**	.96**	.85**	.22**	.13**	-.08	-.10*	.04	.19**	.32**	.24**	.08	.00	.02	.11*
TS		-	.80**	.75**	.28**	.19**	-.07	-.07	.07	.21**	.32**	.29**	.13**	.04	.08	.16**
UI			-	.71**	.19**	.10*	-.08*	-.11*	.02	.18**	.32**	.22**	.07	.00	.01	.09*
SD				-	.14**	.08	-.06	-.08	.04	.13**	.20**	.15**	.02	-.04	-.03	.04
PSQI					-	.62**	.22**	.39**	.49**	.37**	.68**	.71**	.45**	.34**	.38**	.44**
SQ						-	.03	.04	.08	.08	.41**	.44**	.35**	.28**	.27**	.35**
SL							-	.11*	.03	.14**	-.07	-.10*	-.10*	-.08	-.11*	-.10*
SD								-	.41**	-.04	.03	.00	-.02	-.02	-.01	-.02
SE									-	.07	.17**	.10*	.13**	.09*	.12**	.14**
SDI										-	.29**	.14**	.20**	.17**	.16**	.20**
SM											-	.49**	.50**	.40**	.43**	.49**
SDD												-	.42**	.30**	.37**	.40**
CFQ													-	.90**	.90**	.94**
F														-	.72**	.85**
D															-	.76**
FT																-

*Note.* WBSI = White Bear Suppression Inventory; TS = Thought Suppression; UI = Unwanted Intrusive Thoughts; SD = Self-Distractibility; PSQI = Pittsburg Sleep Quality Index; SQ = Sleep Quality; SL = Sleep Latency; SD = Sleep Duration; SE = Sleep Efficiency; SDI = Sleep Disturbance; SM = Use of Sleep Medication; SDD = Sleep Daytime Dysfunction; CFQ = Cognitive Failure Questionnaire; F = Forgetfulness; D = Distractibility; FT = False Triggering. \* $p < .05$ , \*\* $p < .01$

Table 3 displays bivariate correlation matrix of all the variables. It shows pattern of positive and negative relationships between different variables. Overall thought suppression is positively correlated with its domains thought suppression, unwanted intrusive thoughts, self-distractibility, Global scores, sleep quality, sleep disturbance, sleep medication, sleep daytime dysfunction, and false triggering domains of cognitive failure whereas it is negatively correlated with sleep duration. Thought suppression is positively correlated with unwanted intrusive thoughts, self-distractibility, Global scores, sleep quality, sleep disturbance, sleep medication, sleep daytime dysfunction, cognitive failure, and its component false triggering. Unwanted intrusive thoughts are positively correlated with self-distractibility, Global scores, sleep quality, sleep disturbance, sleep medication, sleep daytime dysfunction, and false triggering component of cognitive failure whereas negatively correlated with sleep latency and sleep duration components of Global scores of sleep. Self-distractibility is positively correlated with global scores of sleep, sleep disturbance, sleep medication, and sleep daytime dysfunction, components of overall sleep quality.

The global scores of sleep quality is positively correlated with its components sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, sleep medication, and sleep daytime dysfunction and with cognitive failures, and its components forgetfulness, distractibility, and false triggering. Sleep quality domain is positively correlated with sleep medication, and sleep daytime dysfunction and also with cognitive failures, and its components forgetfulness, distractibility, and false triggering. Sleep latency is positively correlated with sleep duration and sleep disturbance whereas negatively correlated with sleep daytime dysfunction and also with cognitive failures, and its components distractibility, and false triggering.

Sleep duration is positively correlated with sleep efficiency. Sleep efficiency is positively correlated with sleep medication and sleep daytime dysfunction, cognitive failures, and its components forgetfulness, distractibility, and false triggering. Sleep disturbance is positively correlated with sleep medication, and sleep daytime dysfunction, cognitive failures, and its components forgetfulness, distractibility, and false triggering.

Sleep medication is positively correlated with sleep daytime dysfunction, cognitive failures, forgetfulness, distractibility, and false triggering. Sleep daytime dysfunction is positively correlated with cognitive failures, and its components forgetfulness, distractibility, and false triggering. Cognitive failures are positively correlated with its components forgetfulness, distractibility, and false triggering. Forgetting is positively correlated with distractibility and false triggering. Similarly, distractibility is positively correlated with false triggering.

Table 4

*Mean, Standard Deviation, and t-value For Gender on the Study Variables (N = 505)*

Scales	Gender				<i>t</i>	<i>p</i>	95% <i>CI</i>		<i>Cohen's d</i>
	Men ( <i>n</i> = 196)		Women ( <i>n</i> = 309)				<i>LL</i>	<i>UL</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
WBSI	38.62	11.89	39.25	13.80	-.54	.58	-2.90	1.64	
TS	10.36	3.60	10.52	3.91	-.46	.64	-.84	.52	
UI	20.34	6.65	20.77	7.71	-.65	.51	-1.69	.84	
SD	7.91	2.92	7.95	3.10	-.15	.88	-.58	.50	
PSQI	8.82	3.60	9.91	3.81	-3.20	.00	-1.76	-.42	.29
SQ	1.35	1.02	1.57	1.00	-2.35	.01	-.39	-.03	.22
SL	1.33	.79	1.29	.79	.53	.59	-.10	.18	
SD	1.03	.96	1.15	.95	-1.31	.19	-.28	.05	
SE	.42	.84	.73	1.00	-3.63	.00	-.46	-.14	.34
SDI	1.47	.59	1.57	.67	-1.66	.09	-.20	.01	
SM	.85	1.01	1.02	.99	-1.86	.06	-.35	.00	
SDTD	2.37	1.57	2.60	1.67	-1.52	.12	-.52	.06	
CFQ	55.33	18.55	61.91	17.06	-4.08	.00	-9.75	-3.41	.37
F	17.90	5.90	19.23	5.64	-2.53	.01	-2.36	-.29	.23
D	18.46	5.97	20.68	5.69	-4.17	.00	-3.25	-1.17	.38
FT	16.78	6.96	19.15	6.35	-3.85	.00	-3.57	-1.15	.36

*Note.* WBSI = White Bear Suppression Inventory; TS = Thought Suppression; UI = Unwanted Intrusive Thoughts; SD = Self-Distractibility; PSQI = Pittsburg Sleep Quality Index; SQ = Sleep Quality; SL = Sleep Latency; SD = Sleep Duration; SE = Sleep Efficiency; SDI = Sleep Disturbance; SM = Use of Sleep Medication; SDD = Sleep Daytime Dysfunction; CFQ = Cognitive Failure Questionnaire; F = Forgetfulness; D = Distractibility; FT = False Triggering.

Table 4 reflects the group differences among gender on the study variables. The gender differences were found to be significant only for the Global scores of sleep quality and two of its components i.e., sleep quality and sleep efficiency. It is indicated that men have better quality of sleep (since low scores on the scale means better sleep quality) with

a small effect size. It is also significant for Cognitive failures and its components forgetfulness, distractibility, and false triggering. For these group differences women scores are higher than the men with small to moderate effect size of the group differences. For rest of the variables group differences were found to be nonsignificant.

Table 5

*Mean, Standard Deviation, and t-value For Late Adolescence and Early Adulthood on Study Variables (N = 505)*

Scales	Age				<i>t</i>	<i>p</i>	95% <i>CI</i>		<i>Cohen's d</i>
	Late Adolescents ( <i>n</i> = 380)		Early Adulthood ( <i>n</i> = 101)				<i>LL</i>	<i>UL</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
WBSI	38.05	12.46	42.69	14.78	-2.88	.00	-7.80	-1.46	.34
TS	10.18	3.56	11.55	4.48	-2.83	.00	-2.32	-.41	.34
UI	20.09	7.10	22.57	7.85	-3.04	.00	-4.07	-.87	.33
SD	7.77	2.92	8.56	3.38	-2.14	.03	-1.51	-.06	.25
PSQI	9.42	3.76	9.64	3.49	-.54	.58	-1.04	.58	
SQ	1.47	1.02	1.52	.97	-.47	.63	-.27	.17	
SL	1.30	.80	1.32	.76	-.21	.82	-.19	.15	
SD	1.13	.94	.97	1.02	1.47	.14	-.05	.36	
SE	.60	.94	.61	.97	-.10	.91	-.22	.19	
SDI	1.52	.63	1.58	.66	-.87	.38	-.20	.07	
SM	.93	1.00	1.05	1.01	-1.09	.27	-.34	.09	
SDTD	2.48	1.65	2.59	1.58	-.62	.53	-.47	.24	
CFQ	59.37	17.59	59.69	19.03	-.16	.87	-4.26	3.61	
F	18.73	5.91	18.88	5.34	-.24	.80	-1.36	1.05	
D	19.90	5.71	19.42	6.52	.73	.46	-.81	1.78	
FT	18.24	6.60	18.53	6.94	-.39	.69	-1.76	1.17	

*Note.* WBSI = White Bear Suppression Inventory; TS = Thought Suppression; UI = Unwanted Intrusive Thoughts; SD = Self-Distractibility; PSQI = Pittsburg Sleep Quality Index; SQ = Sleep Quality; SL = Sleep Latency; SD = Sleep Duration; SE = Sleep Efficiency; SDI = Sleep Disturbance; SM = Use of Sleep Medication; SDD = Sleep Daytime Dysfunction; CFQ = Cognitive Failure Questionnaire; F = Forgetfulness; D = Distractibility; FT = False Triggering

Table 5 displays group differences between late adolescents and early adulthood among students. The differences were found to be significant only for WBSI and its components thought suppression, unwanted intrusive thoughts, and self-distractibility. With reference to White Bear Suppression Inventory and its components early adulthood scored higher than late adolescents with moderate effect size of the groups. Whereas nonsignificant differences were found for sleep quality and cognitive failures.

Table 6

*Mean, Standard Deviation, and t-value For Family Structure on the Study Variables (N = 505)*

Scales	Family Structure				<i>t</i>	<i>p</i>	95% <i>CI</i>	
	Nuclear ( <i>n</i> = 337)		Joint ( <i>n</i> = 168)				<i>LL</i>	<i>UL</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
WBSI	39.49	13.25	38.03	12.73	1.18	.23	-.96	3.89
TS	10.57	3.76	10.23	3.84	.95	.34	-.36	1.04
UI	20.91	7.42	19.98	7.09	1.34	.17	-.42	2.28
SD	8.00	3.03	7.80	3.02	.67	.50	-.36	.75
PSQI	9.53	3.87	9.40	3.56	.35	.72	-.57	.82
SQ	1.50	1.00	1.46	1.03	.41	.67	-.14	.22
SL	1.26	.77	1.39	.83	-1.63	.10	-.27	.02
SD	1.14	.96	1.02	.95	1.37	.17	-.05	.30
SE	.66	.98	.52	.89	1.63	.10	-.02	.31
SDI	1.56	.66	1.48	.60	1.24	.21	-.04	.19
SM	.99	1.01	.90	.99	.90	.36	-.10	.27
SDD	2.43	1.62	2.65	1.66	-1.42	.15	-.52	.08
CFQ	60.24	17.39	57.58	18.86	1.57	.11	-.65	5.98
F	18.94	5.66	18.27	5.99	1.23	.21	-.39	1.74
D	20.16	5.77	19.14	6.10	1.84	.06	-.06	2.11
FT	18.51	6.49	17.67	7.05	1.32	.18	-.40	2.07

*Note.* WBSI = White Bear Suppression Inventory; TS = Thought Suppression; UI = Unwanted Intrusive Thoughts; SD = Self-Distractibility; PSQI = Pittsburg Sleep Quality Index; SQ = Sleep Quality; SL = Sleep Latency; SD = Sleep Duration; SE = Sleep Efficiency; SDI = Sleep Disturbance; SM = Use of Sleep Medication; SDD = Sleep Daytime Dysfunction; CFQ = Cognitive Failure Questionnaire; F = Forgetfulness; D = Distractibility; FT = False Triggering.

Table 6 displays the differences between study variables across family structures. There were nonsignificant differences between family structures with respect to thought suppression, sleep quality, cognitive failures, and its components.



Table 7

*Mean, Standard Deviation, and t-value For Marital Status on the Study Variables (N = 505)*

Scales	Marital Status				<i>t</i>	<i>p</i>	95% <i>CI</i>	
	Single ( <i>n</i> = 460)		Married ( <i>n</i> = 45)				<i>LL</i>	<i>UL</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
WBSI	38.89	12.93	40.17	14.72	-.62	.53	-5.29	2.73
TS	10.39	3.73	11.20	4.33	-1.36	.17	-1.96	.35
UI	20.57	7.26	20.97	7.94	-.35	.72	-2.65	1.84
SD	7.93	3.00	8.00	3.31	-.14	.88	-.99	.86
PSQI	9.44	3.76	10.02	3.81	-.99	.32	-1.74	.57
SQ	1.47	1.01	1.60	1.03	-.79	.42	-.43	.18
SL	1.29	.79	1.47	.84	-1.44	.14	-.42	.06
SD	1.09	.94	1.20	1.12	-.62	.53	-.45	.23
SE	.62	.95	.56	.96	.40	.68	-.23	.35
SDI	1.53	.63	1.60	.72	-.73	.46	-.27	.12
SM	.95	1.01	1.07	.96	-.77	.44	-.43	.18
SDTD	2.50	1.65	2.53	1.56	-.11	.91	-.53	.47
CFQ	59.39	17.80	58.98	19.38	.14	.88	-5.09	5.92
F	18.70	5.77	18.84	5.90	-.15	.87	-1.91	1.63
D	19.90	5.82	18.98	6.66	1.00	.31	-.88	2.73
FT	18.20	6.71	18.53	6.57	-.31	.75	-2.38	1.72

*Note.* WBSI = White Bear Suppression Inventory; TS = Thought Suppression; UI = Unwanted Intrusive Thoughts; SD = Self-Distractibility; PSQI = Pittsburg Sleep Quality Index; SQ = Sleep Quality; SL = Sleep Latency; SD = Sleep Duration; SE = Sleep Efficiency; SDI = Sleep Disturbance; SM = Use of Sleep Medication; SDD = Sleep Daytime Dysfunction; CFQ = Cognitive Failure Questionnaire; F = Forgetfulness; D = Distractibility; FT = False Triggering

Table 7 displays the differences between study variables across marital status. There is nonsignificant difference with reference to thought suppression, sleep quality, cognitive failures, and its components.

Table 8

*Mean, Standard Deviation, and t-value For Working and Non-Working University Students Differences on the Study Variables (N = 505)*

Scales	Work status				<i>t</i>	<i>p</i>	95% <i>CI</i>		<i>Cohen's d</i>
	Working ( <i>n</i> = 164)		Non-Working ( <i>n</i> = 341)				<i>LL</i>	<i>UL</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
WBSI	39.51	12.94	38.76	13.17	.60	.54	-1.69	3.19	
TS	10.49	3.85	10.45	3.76	.11	.90	-.66	.75	
UI	21.00	7.02	20.41	7.45	.83	.40	-.78	1.94	
SD	8.02	3.13	7.89	2.98	.44	.66	-.43	.69	
PSQI	9.22	3.69	9.62	3.80	-1.11	.26	-1.10	.30	
SQ	1.38	.97	1.54	1.03	-1.64	.10	-.34	.03	
SL	1.37	.84	1.27	.77	1.19	.23	-.06	.24	
SD	1.10	1.00	1.10	.94	.04	.96	-.17	.18	
SE	.63	.95	.60	.95	.26	.79	-.15	.20	
SDI	1.54	.66	1.53	.63	.24	.80	-.10	.13	
SM	.84	.96	1.01	1.02	-1.88	.06	-.36	.00	
SDTD	2.38	1.58	2.57	1.66	-1.22	.22	-.49	.11	
CFQ	57.09	17.40	60.45	18.09	-1.97	.04	-6.69	-.02	.19
F	18.38	5.42	18.88	5.94	-.91	.36	-1.58	.57	
D	18.88	5.99	20.27	5.81	-2.48	.01	-2.48	-.28	.24
FT	17.51	6.32	18.57	6.84	-1.67	.09	-2.31	.18	

*Note.* WBSI = White Bear Suppression Inventory; TS = Thought Suppression; UI = Unwanted Intrusive Thoughts; SD = Self-Distractibility; PSQI = Pittsburg Sleep Quality Index; SQ = Sleep Quality; SL = Sleep Latency; SD = Sleep Duration; SE = Sleep Efficiency; SDI = Sleep Disturbance; SM = Use of Sleep Medication; SDD = Sleep Daytime Dysfunction; CFQ = Cognitive Failure Questionnaire; F = Forgetfulness; D = Distractibility; FT = False Triggering

Table 8 displays the differences between study variables across working and nonworking university students. It can be seen that significant differences were obtained between the groups on the constructs of Overall Cognitive failures and its component distractibility. Here the mean value for nonworking students is higher as compared to working students with minor effect size between the groups. It was also found that differences were nonsignificant with reference to rest of the variables.

Table 9

*Comparison Between Under Graduates, Graduates, and Post-Graduates on Thought Suppression, Sleep Quality, Cognitive Failures and Their Perspective Subscales Continuum Among Students (N = 505)*

Scales	Education						<i>f</i>	<i>p</i>	<i>i-j</i>	<i>(i-j)</i>	95% CI	
	Under graduates ( <i>n</i> = 197)		Graduates ( <i>n</i> = 223)		Post graduates ( <i>n</i> = 85)						<i>LL</i>	<i>UL</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>						
WBSI	36.40	11.73	40.65	13.08	40.76	15.11	6.56	.00	Graduates>Und-grad	4.25	1.21	7.29
									Post-grad>Und-grad	4.36	.33	8.39
TS	9.71	3.37	10.96	3.81	10.89	4.36	6.55	.00	Graduates>Und-grad	1.26	.38	2.14
									Post-grad>Und-grad	1.18	.01	2.35
UI	19.26	6.71	21.45	7.35	21.49	8.14	5.50	.00	Graduates>Und-grad	2.18	.48	3.89
									Graduates>Und-grad	.81	.10	1.51
SD	7.42	2.84	8.22	2.99	8.37	3.40	4.84	.00	Post-grad>Und-grad	.96	.02	1.89
PSQI	9.16	3.81	9.72	3.76	9.65	3.66	1.26	.28				
SQ	1.39	1.03	1.56	1.00	1.53	1.00	1.56	.21				
SL	1.31	.82	1.28	.75	1.34	.82	.22	.79				
SD	1.21	.95	1.00	.92	1.09	1.05	2.48	.08				
SE	.64	.93	.56	.94	.68	1.03	.56	.57				
SDI	1.50	.62	1.57	.65	1.52	.68	.51	.59				
SM	.86	.98	1.08	1.02	.87	.98	2.86	.05				
SDTD	2.26	1.708	2.68	1.61	2.62	1.49	3.76	.02	Graduates>Und-grad	.42	.04	.81
CFQ	58.52	17.22	60.81	17.61	57.48	20.11	1.41	.24				
F	18.55	5.80	18.98	5.77	18.41	5.77	.42	.65				
D	19.74	5.62	20.27	5.71	18.84	6.87	1.85	.15				
FT	17.77	6.71	18.85	6.38	17.68	7.33	1.71	.18				

*Note.* WBSI = White Bear Suppression Inventory; TS = Thought Suppression; UI = Unwanted Intrusive Thoughts; SD = Self-Distractibility; PSQI = Pittsburgh Sleep Quality Index; SQ = Sleep Quality; SL = Sleep Latency; SD = Sleep Duration; SE = Sleep Efficiency; SDI = Sleep Disturbance; SM = Use of Sleep Medication; SDD = Sleep Daytime Dysfunction; CFQ = Cognitive Failure Questionnaire; F = Forgetfulness; D = Distractibility; FT = False Triggering.

Table 9 reflects education related differences across study variables. The table highlights that group differences were significant with respect to educational status of the study participants for Thought Suppression, Sleep Quality, and Cognitive Failures. Differences were significant for overall thought suppression and its components thought suppression, unwanted intrusions, self-distractibility, and also on sleep daytime dysfunction component of global score of sleep quality. Further post-hoc analysis shows that graduate and post graduate students are scoring high on overall thought suppression compared to undergraduate students. Results also show that graduate students have higher sleep daytime dysfunction as compared to undergraduates. Group differences were nonsignificant for all of the other variables.

## **DISCUSSION**

## Discussion

The present study aimed to explore the relationship among thought suppression, sleep quality, and cognitive failures among a sample of university students, through quantitative method of research. Furthermore, the study also explored the relationship of various demographic factors with study variables i.e., gender, age, family structure, marital status, work status, exposure to any traumatic event and education level. Research course utilized the cross sectional research design. The standardized instruments including White Bear Suppression Inventory (Wegner & Zanakos, 1994), Pittsburg Sleep Quality Index (Buysse et al., 1989) and Cognitive Failure Questionnaire (Broadbent et al., 1982) were used for measuring the constructs of thought suppression, sleep quality, and cognitive failures respectively.

To ascertain the psychometric properties of the instruments used in the study, alpha reliabilities were computed for each of scales and their respective domains. It was found that the reliability values for the scales and their subscales used in the present study ranged from .72 to .92 (see 2), thus indicating for satisfactory reliability of the scales (George & Mallery, 2003). It was found that for each of the three scales, their factors had a significant positive correlation amongst themselves, suggesting that these instruments precisely measure the variable that it proposes to measure and thus advocates for scale construct validity. The skewness and kurtosis lie between absolute value of 2 thus establishing that the data is normally distributed (Kim, 2013).

In order to fulfill the study objective that was to determine the relationship between suppression of thoughts, sleep quality, and cognitive failures among university students and for the purpose of estimating strength and direction of relationship among the study variables and their factors, the correlation coefficients were calculated. Bivariate correlation matrix of all the variables is displayed in 3. In line with the first hypothesis that thought suppression will be negatively related with sleep quality among university students, the findings revealed that overall thought suppression and its domains i.e., thought suppression, unwanted intrusive thoughts, and self-distractibility, all were significantly positively correlated with global sleep quality (as the higher scores on sleep quality indicated poor sleep quality). Thus;

indicating negative relationship between both constructs. In support of this, previous literature suggests that people with higher degrees of thought suppression and thought intrusion had poorer sleep quality as evidenced by subjective report, difficulty falling asleep, sleep disturbance, use of sleep medication, and daytime tiredness. Those with greater tendencies toward thought suppression and thought intrusion had higher levels of depression, anxiety and stress (Szasz, 2009)

Similarly, thought suppression, unwanted intrusive thoughts and self-distractibility are positively correlated with Pittsburg Sleep Quality Index and its components, sleep quality, sleep disturbance, sleep medication, sleep daytime dysfunction, and false triggering component of cognitive failure. This means higher the thought suppression, unwanted intrusive thoughts and self-distractibility, higher will be the sleep deprivation. Whereas, WBSI significantly negatively correlated with sleep duration and unwanted intrusive thoughts significantly negatively correlated with sleep latency and sleep duration the components of Global scores of sleep. (Medeiros, Mendes, Lima, & Araujo, 2001) supported this negative correlation as it says the more cognitive intrusions; greater will be the latency to sleep commencement. A positive correlation actually means negative relationship among sleep latency and sleep duration because the low scores on sleep indicates better sleep quality. Szasz (2009) explained that people wait until they are so tired by diverting themselves with television or other activities until they pass out. A few hours later, they often wake up and have difficulty falling asleep again. They report feeling anxiety ranging from vague to specific worries and ruminations (Erskine, Kvavilashvili, & Kornbrot, 2007) This phenomenon highlights the familiar relationship between daytime suppression, nocturnal intrusion and distractibility that shows suppressing a thought with the help of distracters affect the duration of the sleep due to the intrusion. As the correlation between sleep duration and thought suppression is negative that shows higher thought suppression and poor will be the sleep duration.

Keeping in view the objective mentioned above, second hypothesis stated that thought suppression will positively correlate with cognitive failures among university students. The findings revealed that thought suppression is positively correlated with cognitive failures. There is no study which explains the direct relationship of these

two variables, it can be inferred from a study of post-traumatic stress disorder that suppression of unwanted thoughts leads to (Bogason, 2013) cognitive failures. Similarly it has been indicated that thought suppression and cognitive failure have positive relationship among university students (Aikins et al., 2009).

Third hypothesis stated that sleep quality will negatively correlate with cognitive failures among university students. The findings revealed that global score of PSQI is positively correlated with scale of CFQ along with its domains, which operationally implies that sleep quality was negatively correlated with cognitive failures (as the high scores on PSQI indicated poor sleep quality). Whereas, rest of the factors of PSQI were significantly positive correlated with cognitive failures. Similar according to Gobin, Banks, Fins, and Tartar (2015) the sleep quality component of the PSQI has been shown to be a sensitive measure of maladaptive behavior such as excessive use of social media in adults, increased mind wandering (Carciofo et al., 2014) and low positive affect (Bower et al., 2010). Previous literature also showed negative and significant association among sleep quality and academic burnout ultimately predicting cognitive failure between pupils (Arbabisarjou et. al, 2016). Some of the studies showed that quality of sleep has been seen to be associated with one's academic performance; the deficits in attentional process may lead to cognitive failures and thus takes toll from one's performance at different life avenues (Chen et al., 2006; Dahl & Lewin, 2002; Pilcher et al., 1997; Vignau et al., 1997).

The second objective of the research was to determine the role of demographic variables including gender, age, education level, and work status among study variables. With respect to gender, it was hypothesized that female students will have high tendencies for thought suppression and cognitive failures as compared to male university students. The findings of the data partially supported the hypothesis. With respect to thought suppression between males and females, findings revealed that both groups show no significant differences, whereas with respect to cognitive failures, there are significant differences in which females scored higher as compared to males (see table 4). These findings also partially accept the hypothesis that females have higher levels of the emotionality component, producing higher general anxiety (Deffenbacher, 1980). It is inferred that Women tends to have more cognitive failure (Pilcher et al., 1997). However, significant differences were found on the construct of



cognitive failures and its factors. Correspondingly it was found that women show somewhat but significant higher tendencies for suppressing of thoughts that leads to cognitive failure (Blumberg, 2000).

Gender differences were found to be significant only for the Global scores of sleep quality and two of its components i.e., sleep quality and sleep efficiency. Results indicated that women tend to have poor sleep quality as compared to men and it is indicated that men have better quality of sleep (since low scores on the scale means better sleep quality) with a small effect size (see table 4). Prior studies suggested poor sleep quality in large sample of females (Rocha et al., 2010). Similarly, Doğan, Ertekin, & Doğan, (2005) found that men have shown significantly better quality of sleep than women. Therefore, the reason of this difference might be due to the gender roles assigned to women from the society for example, women are usually assigned to do work at home along with their studies leading both home duties and work demands. According to a research, insomnia is a state of poor quality sleep i.e., difficulty falling asleep, early rising, and feeling restless after night sleep. This occurs often in females and may be related to emotional complications that lead to the poor sleep quality (Afandi et al., 2013; Fatima, Doi, & Mamun., 2016; Hung et al., 2013). Evidence from recent studies also found gender difference present in sleep quality in young adults where females shows to have poor sleep quality as compared to men (Fatima et al., 2016; Hung et al., 2013).

According to the hypothesis fifth and sixth that working students will have greater tendencies for thought suppression and cognitive failures as compared to nonworking students and nonworking students will have greater sleep quality as compared to working students. Findings of the current study show no significant differences between the groups on the construct of thought suppression and sleep quality (see Table 8) that shows null hypothesis accepted. Nonworking students show significant difference on the construct of cognitive failure and its factor distractibility. Study revealed that there was a significant negative relationship found between an individual's work environment and their cognitive failures (Klockner, 2018), which show that it can be inferred that there might be a positive relationship between nonworkers and cognitive failures.

Additionally, age, family system, marital status, work status and education related differences were also determined. Results point out that differences are found for the construct of thought suppression and its domains on age group (see table 5). The reason maybe that in high age group, suppression tendencies becomes more dominant. Family system (see table 6) and marital status (see table 7) show no significant differences. Studies found that family system and marital status does not have direct impact on suppressing the thoughts and sleep quality (Chen et al., 2006; Dahl & Lewin, 2002; Pilcher et al., 1997; Vignau et al., 1997).

Educational group differences were computed by doing ANOVA analysis in which undergraduates, graduates and post graduates group differences were observed where significant differences were found for post graduates and graduates students on the construct on thought suppression and also one of the domains of sleep quality i.e., sleep daytime dysfunction. Previous study on college students clarifies the aspects that personally appropriate intrusive thoughts and the effects of different strategies used to manage those intrusive thoughts (Lund, Reider, Whiting, & Prichard, 2010) By this it might appears that naturally suppressing of unwanted thoughts leads more of these distress thoughts and also have greater urge to do something about these thoughts. Evidence found that acceptance may be a useful substitute in coping with unwanted thoughts (Marcks & Woods, 2005). It has also being indicated that short sleep duration is more common among education levels (Jensen, 2003; Stamatakis et al., 2007).

## **Conclusion**

The present study aimed to explore the relationship between thought suppression, sleep quality and cognitive failures among university students. Correlation analysis indicated positive correlation between thought suppression, sleep quality and cognitive failures. Moreover, significant gender differences indicated that females score higher on sleep quality and cognitive failures. With respect to age, findings reveal that individuals in early adulthood score significantly higher on thought suppression. It was also found that students with traumatic event score significantly higher on sleep quality and cognitive failure that indicated poor sleep quality and cognitive failures among university students. Results also indicated that graduate and postgraduate students scored higher on thought suppression.

### **Limitations and Recommendation**

Following are the certain limitations and recommendations of the current study.

- Data was collected using convenient sampling so the sample is not representative.
- Questionnaires based research method was used because of which there are chances of response bias by the participants.
- Future researches can increase the sampling size in order to make the findings more generalizable.
- Data, in future researches can be collected from other cities of Pakistan too in order to have representative sample.
- It is recommended that to employ a comparative framework when studying variables.

### **Implications**

The present study is helpful in developing understanding of thought suppression, sleep quality and cognitive failures. The research can be helpful in generating knowledge about effects of thought suppression on sleep quality and cognitive failures among students which maybe a cause of their hampered progress in university. Accordingly, therapies can be designed for the students to better cope with unwanted thoughts and their repercussions.

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## **APPENDICES**

## Informed consent

I am a student of M.Sc. psychology from National Institute of Psychology, Quaid-i-Azam University, Islamabad. As per research, I need to collect data from people, so I would request you to participate in it. My study will take 15-20 minutes of your precious time. The finding will be used for academic purpose only.

You are requested to read each statement carefully and answer it as genuinely as possible.

Assure you that all the information provided by you will keep confidential and will be used for research purpose only. You have all the rights to discontinue participant at any point without penalty or prejudice.

Please sign below if you read and agree to the aforementioned terms. Your participants will be highly valued.

---

Signature

### Researcher's Information:

Anum Zafar Raja

National Institute of Psychology, Quaid-i-Azam University.

Email: [anumraja20@gmail.com](mailto:anumraja20@gmail.com)



## DEMOGRAPHIC SHEET

Gender: Male  Female

Age (in years): \_\_\_\_\_

Education (in years): \_\_\_\_\_

Family System: Nuclear  Joint

Number of Siblings: \_\_\_\_\_

Birth order: \_\_\_\_\_

Marital Status: Single  Married

Married; No. of Children: \_\_\_\_\_

Working  Non-working

Have you experienced any significant (Impacted your life a great deal) traumatic event in your life?

Yes  No

## WHITE BEAR SUPPRESSION INVENTORY

## Instructions

Please respond to the statements as they actually apply to you. All the obtained information will be kept confidential and will be used for only research purposes.

- If you very often have such experience, tick the response category of 'strongly agree'
- If it often happens, tick the response category of 'agree'
- If you are undecided, tick 'Neutral'
- If seldom happens, tick 'disagree'
- And if never happens, tick 'strongly disagree'

	Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	There are things I prefer not to think about	0	1	2	3	4
2	Sometimes I wonder why I have the thoughts I do	0	1	2	3	4
3	I have thoughts that I cannot stop	0	1	2	3	4
4	There are images that come to mind that I cannot erase	0	1	2	3	4
5	My thoughts frequently return to one idea	0	1	2	3	4
6	I wish I could stop thinking of certain things	0	1	2	3	4
7	Sometimes my mind races so fast I wish I could stop it	0	1	2	3	4
8	I always try to put problems out of mind	0	1	2	3	4
9	There are thoughts that keep jumping into my head	0	1	2	3	4
10	Sometimes I stay busy just to keep thoughts from intruding my mind	0	1	2	3	4
11	There are things that I try not to think about	0	1	2	3	4
12	Sometimes I really wish I could stop thinking	0	1	2	3	4
13	I often do things to distract myself from my thoughts	0	1	2	3	4
14	I have thoughts that I try to avoid	0	1	2	3	4
15	There are many thoughts that I have that I don't tell anyone	0	1	2	3	4

## PITTSBURG SLEEP QUALITY INDEX

**Instructions:**

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

What time have you usually gone to bed at night? \_\_\_\_\_

How long (in minutes) has it usually takes you to fall asleep each night? \_\_\_\_\_

What time have you usually gotten up in the morning? \_\_\_\_\_

How many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed)

\_\_\_\_\_

For each of the remaining questions, check the one best response. Please answer all questions.

5	How often have you had trouble sleeping because you.	<b>Not during the past month</b>	<b>Less than a week</b>	<b>Once or twice a week</b>	<b>Three or more Times a week</b>
	a) Cannot get to sleep within 30 minutes	0	1	2	3
	b) Wake up in the middle of the night or early morning	0	1	2	3
	c) Have to get up to use the bathroom	0	1	2	3
	d) Cannot breathe comfortably	0	1	2	3
	e) Cough or snore loudly	0	1	2	3
	f) Feel too cold	0	1	2	3
	g) Feel too hot	0	1	2	3
	h) Had bad dreams	0	1	2	3
	i) Have pain	0	1	2	3
	j) Other reason(s), including how often during the past month have you had trouble sleeping because of this?	0	1	2	3
6	How would you rate your sleep quality overall?	<b>Very Good</b>	<b>Fairly good</b>	<b>Fairly bad</b>	<b>very bad</b>
		0	1	2	3
		<b>Not during the past month</b>	<b>Less than a week</b>	<b>Once or twice a week</b>	<b>Three or more Times a week</b>
7	How often have you taken medicine to help you sleep (prescribed or "over the counter")?	0	1	2	3

	<b>Statements</b>	<b>Not during the past month</b>	<b>Less than a week</b>	<b>Once or twice a week</b>	<b>Three or more Times a week</b>
8	How often have you had trouble staying awake while driving, eating meals, or engaging in social activity?	0	1	2	3
		<b>No problem at all</b>	<b>Very Slightly problem</b>	<b>Somewhat a problem</b>	<b>Very big problem</b>
9	How much of a problem has it been for you to keep up enough enthusiasm to get things done?	0	1	2	3
		<b>No partner</b>	<b>Partner in other room</b>	<b>Same room but different bed</b>	<b>Same bed</b>
10	Do you have a bed partner	0	1	2	3
		<b>Not during the past month</b>	<b>Less than a week</b>	<b>Once or twice a week</b>	<b>Three or more Times a week</b>
	If you have a roommate or bed partner, ask him/her how often in the past month you have had	0	1	2	3
	a) Loud snoring	0	1	2	3
	b) Long pauses between breaths while asleep	0	1	2	3
	c) Legs twitching or jerking while you sleep	0	1	2	3
	d) Episodes of disorientation or confusion during sleep	0	1	2	3
	e) Other restlessness while you sleep; please describe	0	1	2	3

## COGNITIVE FAILURE QUESTIONNAIRE

**Instructions**

The following questions are about minor mistakes which everyone makes from time to time, but some of which happen more often than others. We want to know how often these things have happened to you in the past 6 months. Please circle the appropriate number.

	Statements	Very often	Quite often	Occasionally	Very rarely	Never
1.	Do you read something and find you haven't been thinking about it and must read it again?	1	2	3	4	5
2.	Do you find you forget why you went from one part of the house to the other?	1	2	3	4	5
3.	Do you fail to notice signposts on the road?	1	2	3	4	5
4.	Do you find you confuse right and left when giving directions?	1	2	3	4	5
5.	Do you bump into people?	1	2	3	4	5
6.	Do you find you forget whether you've turned off a light or a fire or locked the door?	1	2	3	4	5
7.	Do you fail to listen to people's names when you are meeting them?	1	2	3	4	5
8.	Do you say something and realize afterwards that it might be taken as insulting?	1	2	3	4	5
9.	Do you fail to hear people speaking to you when you are doing something else?	1	2	3	4	5
10.	Do you lose your temper and regret it?	1	2	3	4	5
11.	Do you leave important letters unanswered for days?	1	2	3	4	5
12.	Do you find you forget which way to turn on a road you know well but rarely use?	1	2	3	4	5
13.	Do you fail to see what you want in a supermarket (although it's there)?	1	2	3	4	5
14.	Do you find yourself suddenly wondering whether you've used a word correctly?	1	2	3	4	5
15.	Do you have trouble making up your mind?	1	2	3	4	5
16.	Do you find you forget appointments?	1	2	3	4	5
17.	Do you forget where you put something like a newspaper or a book?	1	2	3	4	5
18.	Do you find you accidentally throw away the thing you want and keep what you meant to throw away – as in the example of throwing away the matchbox and putting the used match in your pocket?	1	2	3	4	5

	<b>Statements</b>	<b>Very often</b>	<b>Quite often</b>	<b>Occasionally</b>	<b>Very rarely</b>	<b>Never</b>
9.	Do you daydream when you ought to be listening to something?	1	2	3	4	5
10.	Do you find you forget people's names?	1	2	3	4	5
11.	Do you start doing one thing at home and get distracted into doing something else (unintentionally)?	1	2	3	4	5
12.	Do you find you can't quite remember something although it's "on the tip of your tongue"?	1	2	3	4	5
13.	Do you find you forget what you came to the shops to buy?	1	2	3	4	5
14.	Do you drop things?	1	2	3	4	5
15.	Do you find you can't think of anything to say?	1	2	3	4	5

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## Scale permission

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Eric Rassin <rassin@essb.eur.nl>  
To: anumzafar 5142 <anumraja20@gmail.com>

Wed, Apr 25, 2018 at 1:49 PM

Dear Anum,

Of course, you're free to use the scale. I don't have it in English, so you'll have to adopt it from the article.

Good luck and best wishes,

Eric Rassin

**From:** anumzafar 5142 [mailto:anumraja20@gmail.com]

**Sent:** 25 April 2018 10:11 AM

**To:** Eric Rassin <rassin@essb.eur.nl>

**Subject:** Scale permission

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## Scale permission

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Gasiorowski, Mary <GasiorowskiMJ@upmc.edu>  
To: "anumraja20@gmail.com" <anumraja20@gmail.com>

Sat, Apr 28, 2018 at 1:53 AM

Sent on behalf of Dr. Buysse

Dear Anum Zafar Raja,

You have my permission to use the PSQI for your research study. You can find the instrument, scoring instructions, the original article, links to available translations, and other useful information at [www.sleep.pitt.edu](http://www.sleep.pitt.edu) under the Research/Instruments tab. Please ensure that the PSQI is accurately reproduced in any on-line version (including copyright information). We request that you do cite the 1989 paper in any publications that result.

**Note that Question 10 is not used in scoring the PSQI. This question is for informational purposes only, and may be omitted during data collection per requirements of the particular study.**

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Good luck with your research.



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## Scale permission

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Steven Kass <skass@uwf.edu>  
To: anumzafar 5142 <anumraja20@gmail.com>

Wed, Apr 25, 2018 at 11:47 PM

Hi Anum,  
I cannot grant permission for you to use the scale because I am not the author of that scale. However, the scale is published in a journal, so it should be usable by anyone for research purposes. I have included the article you mention which contains all of the items in the scale and describes the factors that we identified. Good luck with your research.  
Steve Kass

**Steven J. Kass, Ph.D.**  
*Professor / I-O Track Coordinator*  
Website: <http://uwf.edu/coh/departments/psychology/our-faculty/faculty-profiles/steven-kass.html>  
Lab Website: <http://uwf.edu/coh/departments/psychology/research/human-factors-laboratory/>

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