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Intolerance of Uncertainty, Anxiety, and Insomnia Among University Students in Pakistan: A Correlational and Regression Study

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ABSTRACT

The present study aimed to explore the relationship between intolerance of uncertainty, anxiety and insomnia amongst the university students in Punjab Pakistan. The research design used was quantitative, cross sectional correlational design. Participants were 200 students (93 male and 107 female) from universities with ages ranging from 18 to 30 years old (aged 18–30) recruited by convenience sampling method. A demographic information sheet, Intolerance of Uncertainty Scale-27 (IUS-27), Generalized Anxiety Disorder 7 (GAD-7), and Insomnia Severity Index (ISI) were used to collect data. Descriptive statistics, Cronbach's alpha, Pearson product-moment correlations, simple linear regression, multiple linear regression and independent-samples t-tests were performed to analyze data. Intolerance of uncertainty was positively correlated with anxiety and insomnia. Additionally, anxiety was significantly positively correlated with insomnia. Intolerance of uncertainty significantly predicted anxiety, explaining 27.4% of its variance. It also significantly predicted insomnia, explaining 6.5% of its variance. But when both IU and anxiety were used as predictors of insomnia, only anxiety remained significant while IU was not. The results indicate that intolerance of uncertainty, especially, is one of the key cognitive variables that is strongly linked to anxiety among university students and anxiety may partially explain the association between IU and insomnia. The results suggest the possible importance of cognitive-behavioral approaches in the context of uncertainty and anxiety-management in university counseling practice. Since the study was cross-sectional and used self-report measures, the conclusions made are not causal.

Keywords: *Intolerance of uncertainty, anxiety, insomnia, university students, psychological distress, Pakistan.*

INTRODUCTION

University education is a developmental stage of life important for maturation in terms of independence, education, socialization, career choice and responsibility taking. While attending university, students can find opportunities for their growth and development, they can also face with academic burden, exam stress, financial problems, job anxiety, family stress, and social and personal stressors at the same time. These demands can lead to psychological stress and adjustment problems to university life. Intolerance of uncertainty (IU) is one of the psychological factors related to student well-being. Intolerance of

uncertainty is a pattern of negative reactions to uncertainty and an unfavourable attitude toward uncertainty (Freeston et al., 1994; Carleton et al., 2007). People with high IU might have a hard time when you don't know what will happen, especially if it's not likely to be bad. The uncertainty itself can thus be a source of distress without necessarily having to be associated with the threat. The idea of IU has had a significant impact in cognitive models of generalized anxiety disorder and excessive worry. The Intolerance of Uncertainty Model posits that some people struggle to tolerate uncertainty and resort to over-worrying, threat anticipation, reassurance seeking, avoidance and other cognitive and behavioral strategies designed to manage uncertainty (Dugas et al., 1998).

Some people with high IU may always expect to experience bad things, instead of reacting to an actual threat. Important questions in a university setting are: Will a student pass an exam? Will a student get a job? Will a student be successful? Will a student achieve the family's expectations? Will a student succeed in the academic program? Will a student make the proper career choices? Increasingly, research has conceptualized IU as a transdiagnostic vulnerability that is linked to a variety of psychological distresses. In clinical (Gentes & Ruscio, 2011) and non-clinical populations (Carleton, 2016), higher IU has been correlated with anxiety and other emotional problems. In the university community, studies have also suggested a relationship between IU and anxiety, stress, depression, and school problems. For instance, Kim et al. (2023) examined IU among university students in Pakistan and noted the importance of IU with respect to psychological distress among them. But not all findings have been similar in all contexts, and the relationships may vary depending on cultural, methodological and contextual factors. Another psychological concern which is of great significance among students of universities is anxiety.

Anxiety is a mix of emotional, cognitive and physiological reactions to a real or imagined threat. Students at college or university can feel anxious about their studies, exams, fitting in with others, paying for their studies, family expectations and job prospects. Previous research has suggested that university students experience high levels of anxiety, which may have implications for their academic performance, emotional health and functioning in everyday life. The theoretical connection between IU and anxiety is of special interest. People with intolerance of uncertainty may have a tendency to repeatedly expect negative events and worry to try to prepare for or control uncertain events. These thoughts can keep or worsen anxiety. Empirically, a positive correlation between IU and anxiety has been confirmed with students and other groups (Huang et al., 2023; Nekić & Mamić, 2019). Additionally, a meta-analysis of 23 studies by Gentes and Ruscio (2011) has shown the importance of IU for the symptoms of generalized anxiety disorder and other psychological distresses.

Among the university students, anxiety is important, along with insomnia. Insomnia is also an important concern among the university students, in addition to anxiety. Insomnia is characterized by problems falling asleep or staying asleep, waking too early, not being satisfied with sleep, or problems caused by sleep problems. Sleep disturbances can impact on attention, memory skills, mood control, functioning during the day, and learning. Students at university may be especially prone to poor sleep, due to time schedules, stress, irregular waking and sleeping times, and psychological issues. Cognitive processes related to worry and arousal might explain the link between IU and insomnia. Students who find uncertainty challenging may keep ruminating about academic, social, financial or future issues when they go to sleep. Constant rumination and cognitive activation may disrupt sleep onset and/or sleep continuity. One theory that focuses on the role of excessive thought activity, worry, and arousal in perpetuating insomnia is the Cognitive Model of Insomnia (CMI) developed by Harvey (2002). In keeping with this view, Lauriola et al. (2019) found associations between IU, anxiety-related factors, subjective sleep quality and insomnia symptoms.

Insomnia and anxiety are also intricately connected. Excessive worry, physiological arousal, intrusive thoughts and trouble relaxing can all disrupt sleep. Lack of or disrupted sleep can, on the other hand, be a factor that may affect emotional control and daytime functioning. Studies of university students have shown a correlation between anxiety and sleeping disturbances (insomnia) (Choueiry et al., 2016). Though there was previous study conducted on individuals such as IU and anxiety, anxiety and

insomnia, IU and sleep related problems, but a comparison of these three variables has been comparatively less.There had been few previous studies which have investigated the three variables together in the same sample of university students in Pakistan. It is especially pertinent in the Pakistani context where students in the university may experience ambiguity regarding their academic performance, job prospects, economic situation, parental expectations, socialization etc. The study of IU and anxiety and insomnia may thus offer a more comprehensive picture of cognitive and emotional aspects related to student psychological well-being. The present study was therefore designed to explore the relationships between Intolerance of uncertainty, anxiety and insomnia among university students in Pakistan. The study focused specifically on the relation between IU and anxiety, the relation between IU and insomnia, and the ability of IU to significantly predict anxiety and insomnia.

METHOD

Research Design

A quantitative, cross-sectional correlational research design was used to explore the relationships between intolerance of uncertainty, anxiety and insomnia. All of the study variables were measured. To explore the association and predictiveness of IU, Pearson correlation and regression analyses were performed.

Participants

The present study involved 200 university students aged 18-30 years in which 93 are male and 107 are female of public and private universities of Punjab Pakistan. The non-probability convenience sampling technique was used in selecting the participants based on their accessibility, availability and willingness to participate. The participants had to be university students, aged between 18 and 30 years, and consent to participate in the study voluntarily. People who did not register as a student at a university, children outside of the specified age group, people who didn't consent, participants who had incomplete answers were not included. The thesis also excluded those who had severe known psychiatric or neurological disorders that might be likely to affect responses significantly. The type of sampling method used in this study is non-probability sampling with the technique of convenience sampling.

Measures

Demographic Sheet

Data on demographic information was collected using a self-constructed demographic sheet. It contained age, gender, education, job, marital status, and income levels and residential areas. This information was utilized to describe the sample characteristics and to help interpret the findings between different demographic groups.

Intolerance of Uncertainty Scale (IUS-27)

The scale IUS-27 was used to measure the intolerance of uncertainty in present study. Developed originally by Freeston et al. (1994) and later validated in English by Buhr and Dugas (2002). It is comprised of 27 items that assess an individual's emotional, cognitive and behavioral responses to uncertainty. The scale has a 5-point Likert response format, where 1 = Not at all characteristic of me and 5 = Entirely characteristic of me. It measures two aspects: intolerance of uncertainty – prospective and inhibitory. The higher the score, the more intolerant of uncertainty. The IUS-27 is reliable and valid with good internal consistency and construct in previous studies and is also demonstrated in different populations. The IUS-27 was chosen, as it is a short, reliable, extensively used questionnaire to measure intolerance of uncertainty. In the present sample, the IUS demonstrated excellent internal consistency, with Cronbach's $\alpha = .914$.

Generalized Anxiety Disorder Scale (GAD-7)

The Generalized Anxiety Disorder Scale (GAD-7) is a validated 7-item self-reported rating scale that measures the symptoms of GAD in this study. The Generalized Anxiety Disorder Scale-7 (GAD-7) was created by Spitzer et al. (2006). It is a very common 7-item, self-report questionnaire used to measure the severity of generalized anxiety symptoms. The scale has four response points on a Likert scale from "0 = Not at all" to "3 = Nearly every day." The higher the score, the more severe the anxiety. The GAD-7 has shown to have good reliability, validity and sensitivity in the evaluation of anxiety symptoms and has been widely validated in clinical and non-clinical populations. The GAD-7 is deemed suitable for the present study due to the strong link between intolerance of uncertainty with future oriented worry, apprehension, overthinking and inability to control anxious thoughts. The GAD-7 demonstrated good internal consistency in the current sample, with Cronbach's $\alpha = .879$.

Insomnia Severity Index (ISI)

In current study Insomnia Severity Index (ISI) is used to measure insomnia. The Insomnia Severity Index (ISI) was developed by Bastien, Vallieres and Morin (2001). It comprises 7 items to evaluate the severity of symptoms of insomnia and their interference on daily life. The response format of the scale is based on a 5-point Likert scale with the 0 = No problem and 4 = Very severe problem. It assesses the problems of initiating sleep, maintaining sleep, waking up too early in the morning, satisfaction with sleep, and daytime dysfunction. Scores on the scale increase with the severity of the insomnia symptoms. ISI is a widely used instrument in sleep research and is a reliable and valid instrument with good psychometric properties in different populations. The internal consistency of the ISI in the present sample was Cronbach's $\alpha = .612$. Although internal consistency was lower than recommended, the value was considered acceptable for exploratory research.

Procedure

Data collection was done with the consent of the relevant institutions. The participants were recruited in universities and briefed on the purpose and procedures of the study. Before participation informed consent was obtained. The questionnaires were printed and given out or completed via Google Forms and comprised the demographic sheet, IUS-27, GAD-7 and ISI. All the answers were anonymous, then coded and entered into the SPSS for analysis.

Ethical Considerations

Participation was voluntary. Participants were told they could opt out of the study at any time, with no consequences. The confidentiality and anonymity of the participants were ensured during all the research process. The data were utilized for academic goals and participants were not treated in any type of bodily or psychological distress during the data collection.

Data Analysis

The data were analyzed with the help of Statistical Package for the Social Sciences (SPSS). The study variables were presented in terms of descriptive statistics. Cronbach's alpha was used to assess the internal consistency. Pearson product-moment correlation coefficients were used to analyze the relationships between IU, anxiety and insomnia. Simple linear regression analyses were performed to check for the predictive power of IU in anxiety and insomnia. The multiple linear regression analysis was conducted to explore insomnia when entered IU and anxiety were entered simultaneously as predictors. Independent-samples t-tests were also used to explore the differences between males and females. p values $< .05$ were deemed significant.

RESULTS

Reliability and Descriptive Statistics

All three measures were administered to 200 participants. The GAD-7 demonstrated good internal consistency ($\alpha = .879$), while the IUS demonstrated excellent internal consistency ($\alpha = .914$). The ISI showed a Cronbach's alpha of .612.

The mean anxiety score was 1.14 (SD = 0.65), the mean insomnia score was 1.49 (SD = 0.54), and the mean IU score was 2.39 (SD = 0.66). The distributions were considered sufficiently appropriate for parametric statistical analyses based on the reported skewness and kurtosis values.

Correlations among Intolerance of Uncertainty, Anxiety, and Insomnia

Pearson product-moment correlations indicated statistically significant positive associations among all three study variables.

IU demonstrated a moderate positive correlation with anxiety, $r(198) = .523$, $p < .001$. Thus, higher levels of intolerance of uncertainty were associated with higher anxiety symptoms.

IU was also positively correlated with insomnia, $r(198) = .254$, $p < .001$. Therefore, students reporting greater intolerance of uncertainty also tended to report greater insomnia symptoms.

Anxiety was positively correlated with insomnia, $r(198) = .296$, $p < .001$, indicating that greater anxiety symptoms were associated with greater insomnia severity.

Regression Analysis

A simple linear regression was conducted to examine whether IU predicted insomnia. The regression model was statistically significant, $F(1, 198) = 13.672$, $p < .001$, and explained 6.5% of the variance in insomnia, $R^2 = .065$, adjusted $R^2 = .060$. IU was a significant positive predictor of insomnia, $B = 0.207$, $SE = 0.056$, $\beta = .254$, $t = 3.698$, $p < .001$. Thus, greater intolerance of uncertainty was associated with greater insomnia symptoms.

A second simple linear regression examined whether IU predicted anxiety. The model was statistically significant, $F(1, 198) = 74.590$, $p < .001$, explaining 27.4% of the variance in anxiety, $R^2 = .274$, adjusted $R^2 = .270$. Intolerance of uncertainty significantly predicted anxiety, $B = 0.516$, $SE = 0.060$, $\beta = .523$, $t = 8.637$, $p < .001$. The positive standardized coefficient indicated that higher IU was associated with higher anxiety symptoms.

A multiple linear regression was conducted with intolerance of uncertainty and anxiety entered simultaneously as predictors of insomnia. The overall model was statistically significant, $F(2, 197) = 11.063$, $p < .001$, explaining 10.1% of the variance in insomnia, $R^2 = .101$, adjusted $R^2 = .092$. When both predictors were included, anxiety remained a significant predictor of insomnia, $B = 0.185$, $SE = 0.066$, $\beta = .224$, $t = 2.823$, $p = .005$. In contrast, intolerance of uncertainty was no longer statistically significant after controlling for anxiety, $B = 0.112$, $SE = 0.065$, $\beta = .137$, $t = 1.729$, $p = .085$.

These findings indicate that although IU was significantly associated with and independently predicted insomnia when examined alone, its unique predictive contribution was not statistically significant after anxiety was included in the model. This pattern is consistent with the possibility that anxiety accounts for part of the association between intolerance of uncertainty and insomnia; however, a mediation effect cannot be concluded because formal mediation analysis was not conducted.

Gender Differences

Independent-samples *t*-tests indicated no statistically significant gender differences in insomnia, intolerance of uncertainty, or anxiety.

Insomnia did not differ significantly between gender groups, $t(197.84) = -1.679$, $p = .095$. IU also did not differ significantly, $t(195.27) = -0.683$, $p = .496$. Similarly, anxiety scores did not significantly differ between groups, $t(198) = 0.105$, $p = .916$.

DISCUSSION

The present study focused on the relationship between intolerance of uncertainty, anxiety and insomnia among the university students in Pakistan. The Intolerance of Uncertainty Model and the Cognitive Model of Insomnia were the chief study models. Overall, there were statistically significant positive relationships between all three. The strongest relationship was for IU with anxiety, with anxiety also showing a positive relationship with insomnia, and the weakest relationship was between IU and insomnia. The best result was the positive correlation between IU and anxiety. Moderate correlation was found between IU and anxiety ($r = .523$, $p < .001$) and 27.4% of anxiety's variance was explained by IU. This result does align with the theoretical claim that the perception of uncertainty that is threatening or unacceptable could lead to excessive worry, threat anticipation and to attempts to gain certainty. Thus, the results lend support to the relevance of the Intolerance of Uncertainty Model in the understanding of anxiety in university students.

Students at the university are often faced with situations of uncertainty regarding their academic performance, exams, career choice, employment, money, relations and family. These situations can cause students with a low tolerance for uncertainty to engage in a "what if" thinking loop and worry about what might happen. This mental work can lead to chronic anxiety. The present result is consistent with previous findings showing that there are relationships between IU and anxiety among students and other populations (Gentes & Ruscio, 2011; Huang et al., 2023). This discovery is also very significant for the country of Pakistan. There are few previous studies related to IU and anxiety, stress and depression in University students in Pakistan (Kim et al., 2023). However, some previous studies did not come to a clear conclusion, where the current study revealed a significant positive correlation between IU and anxiety. It implies that uncertainty-related cognition could be a significant psychological factor to be explored in the context of students' anxiety in Pakistan. The other key conclusion was that insomnia was positively correlated with IU.

The Pearson correlation between IU and insomnia was significant ($r = .254$, $p < .001$) and simple regression analysis showed that IU significantly predicted insomnia, accounting for 6.5% of the variance in insomnia. This association was not stronger than the IU–anxiety association, but it does lend support to the possibility that uncertainty-related cognitive processes are important to sleep difficulties. The Cognitive Model of Insomnia (CM-I) (Harvey, 2002) is one possible theoretical explanation. People who can't stand uncertainty and are thinking about unsolved issues and potential future events during times of trying to sleep may not be able to stop that thinking. Cognitive and affective arousal (worries, rumination, threat anticipation) may interfere with the sleep transition and lead to sleep dissatisfaction. In a similar study, Lauriola et al. (2019) found that subjective sleep quality, variables related to anxiety, and IU were related to each other and to insomnia symptoms. The third finding was that there were positive correlations between anxiety and insomnia ($r = .296$, $p < .001$).

Similar findings to the current study were previously found in a study among university students, which showed that there is a relationship between anxiety and insomnia (Choueiry et al., 2016). Anxiety can disrupt sleep due to over-thinking, hyperarousal, inability to unwind and overthinking about school or personal issues. Meanwhile, nighttime problems could lead to emotional and cognitive issues during the day. As the present study was of a cross-sectional nature, however, the direction of this relationship

could not be determined. A crucial point that came out of this was that for every participant, when the researchers included both IU and anxiety in a regression model predicting insomnia, they found that the anxiety was the stronger predictor. Overall model was significant, accounting for 10.1% of the variance in insomnia. Anxiety remained a significant predictor, whereas IU was no longer statistically significant.

This indicates that the relationship between IU and insomnia is likely to be observed in a large portion of the variance of the anxiety symptoms. The discovery should be taken with a pinch of salt. Mediation was not explicitly tested in the present study. Thus, it is not possible to determine that statistically anxiety is a mediator between IU and insomnia. Conversely, the original relationship between IU and insomnia was diminished and was not significant after the statistical control of anxiety. Further analyses with formal mediation models and a longitudinal design might directly test the role of anxiety as a mechanism between IU and sleep problems. The combined results indicate that the relationship between IU and anxiety might be more direct, whereas that between IU and insomnia could be more indirect or be more related to anxiety symptoms. This pattern suggests a possible way to intervene psychologically. For students who have persistent anxiety, particularly related to uncertainty tolerance, interventions aimed at maladaptive beliefs related to uncertainty, excessive worry, and avoidance can be helpful.

Cognitive-behavioural therapy might be especially appropriate, therefore. Interventions may include detection of the maladaptive interpretations of situations of uncertainty, reduction in excessive worry, enhancement of tolerance for uncertainty and strengthening of adaptive coping responses. There is also the possibility of implementing anxiety management strategies and sleep-focused psycho-education in University counseling services. The results also support the need to take consideration to students' psychological problems comprehensively. University counselling services should consider measuring the uncertainty related cognition, anxiety symptoms and sleep difficulties as a composite rather than as separate issues.

LIMITATIONS

The results should be interpreted in the light of some limitations. The study was of a cross sectional correlational design for the first time. Therefore, no causal relationships between IU, anxiety and insomnia can be determined. The statistical significance of the predictions of IU did not indicate that the high IU causes anxiety and insomnia. Persistent sleep disturbances, as well as anxiety, may also affect perceptions and tolerance of uncertainty. Longitudinal study required to establish temporal relationships. Second, self-report measures were used for all of the major study variables. Self-report data can be affected by recall problems, personal interpretation, response biases, and social desirability. Thirdly, convenience sampling was applied. Hence, the findings of the present study may not be generalizable to all the university students in Pakistan, especially to those from diverse geographical, socioeconomic, academic and institutional settings. Fourth, the study only examined the specific symptoms of IU, anxiety and insomnia, and did not examine other potentially relevant factors including academic stress, depression, perfectionism, emotion regulation, coping styles, social support, financial stressors, family stressors, sleep hygiene, caffeine, or technology use. Fifth, insomnia was measured by self-report rather than objective measures of sleep. Sleep diaries, actigraphy, or clinical assessments of sleep may be included in future studies. Situational analysis and comparison of IU as a whole was done instead of breaking it down into prospective and inhibitory dimensions (situational analysis). Further studies are needed to assess if these dimensions are differently related to anxiety and sleep outcomes. Lastly, while the multiple regression results indicated that anxiety could be a part of the link between IU and insomnia, formal mediation analysis was not conducted. It is, therefore, not the current findings that should be taken as evidence of mediation.

Implications

The results have implications for psychological research, university counseling, and student mental-health services. IU seems to be especially applicable to the symptoms of anxiety in University students.

When students demonstrate ongoing concerns and/or anxiety, assessment of uncertainty-related cognition could be helpful. University counseling services may include cognitive behavioural techniques that attempt to change the negative thoughts associated with uncertainty or shape coping styles to reduce excessive worry, enhance coping with uncertainty, and foster tolerance for uncertainty. For students with concurrent anxiety and sleep problems, anxiety-management skills and sleep-hygiene education could be helpful. Research-wise, future research should be conducted with longitudinal designs, larger and more representative samples, and formal mediation or structural equation approaches. The possibility of adding other factors like academic stress, rumination, emotional regulation, perfectionism, coping, resilience and social support could prove to be a more complete picture of student psychological functioning.

CONCLUSION

The present study established the strong positive relationships between intolerance of uncertainty, anxiety and insomnia among university students in Pakistan. There was a moderate association between IU and anxiety, as well as a smaller, but significant, association between IU and insomnia, and anxiety was significantly associated with insomnia. Both anxiety and insomnia were significantly predicted by IU, if analyzed independently. Anxiety was retained in the model, however, when anxiety and IU were both entered simultaneously in the same model predicting insomnia, the latter was not significant. Overall, the results indicated that intolerance of uncertainty is a significant cognitive contributor to psychological distress (especially anxiety) among university students. The results also indicate possible overlap between the association of IU and insomnia symptoms and those of anxiety. The present cross-sectional design does, however, not allow causal and mediation inferences. Longitudinal studies that implement formal mediation models could shed light on the processes that link intolerance of uncertainty, anxiety, and sleep problems.

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