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Intolerance of Uncertainty and Its Association with Anxiety Severity Among Patients with Anxiety Disorders: A Cross-Sectional Study.

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Abstract

Background: Intolerance of uncertainty is a dispositional tendency to interpret uncertain situations as distressing or unacceptable. It is increasingly recognized as a transdiagnostic cognitive vulnerability across anxiety disorders, although clinical evidence relating it to overall anxiety severity remains limited. ***Objectives:*** To assess intolerance of uncertainty and examine its association with anxiety severity among patients with anxiety disorders. ***Methods:*** This cross-sectional study included 100 adults with anxiety disorders attending the Department of Psychiatry, Mamata Academy of Medical Sciences, Bachupally, Hyderabad, from May 2025 to April 2026. Anxiety severity was assessed using the Hamilton Anxiety Rating Scale, and intolerance of uncertainty was measured using the 12-item Intolerance of Uncertainty Scale. Group differences were examined using one-way analysis of variance. Pearson correlation and multiple linear regression were used to evaluate associations. ***Results:*** The mean age was 34.8 ± 10.7 years, and 58.0% were female. Generalized anxiety disorder was the most frequent diagnosis (46.0%). Mild, moderate, and severe anxiety occurred in 28.0%, 42.0%, and 30.0%, respectively. The mean Hamilton Anxiety Rating Scale and Intolerance of Uncertainty Scale scores were 23.6 ± 8.2 and 35.7 ± 9.4. Intolerance-of-uncertainty scores increased across mild, moderate, and severe anxiety groups (26.9 ± 6.1, 35.8 ± 6.8, and 43.8 ± 6.5; P<0.001). The total intolerance-of-uncertainty score correlated strongly with anxiety severity (r=0.68; P<0.001). After covariate adjustment, it remained independently associated with anxiety severity (B=0.57; 95% confidence interval: 0.43–0.71; P<0.001). ***Conclusion:*** Greater intolerance of uncertainty was independently associated with more severe anxiety. Assessing this characteristic could support formulation and severity-focused psychological care across anxiety disorders.

Keywords: anxiety disorders; anxiety severity; cognitive vulnerability; Hamilton Anxiety Rating Scale; intolerance of uncertainty; IUS-12.

INTRODUCTION

Anxiety disorders are common psychiatric conditions characterized by excessive fear, anticipatory apprehension, avoidance, and physical arousal. Their clinical expression varies across generalized anxiety disorder, panic disorder, social anxiety disorder, and related diagnoses, yet these conditions share cognitive processes that can amplify threat perception and sustain distress. Symptom-focused diagnostic categories remain essential for clinical communication; however, transdiagnostic mechanisms offer an additional framework for explaining why anxiety persists across apparently different presentations. Intolerance of uncertainty has emerged as one such mechanism and has become increasingly relevant to contemporary cognitive models of emotional disorders.[1-4]

Intolerance of uncertainty refers to a dispositional tendency to perceive uncertain events as stressful, unacceptable, or threatening regardless of their probability. People with high intolerance of uncertainty can respond to incomplete information with worry, indecision, reassurance seeking, avoidance, or cognitive paralysis. The construct was initially studied within generalized anxiety disorder, where uncertainty can trigger repetitive attempts to anticipate and control possible adverse outcomes.[1,2] Subsequent work has shown that intolerance of uncertainty is not restricted to generalized anxiety. It is also associated with panic symptoms, social anxiety, obsessive-compulsive symptoms, depression, and broader emotional psychopathology.[3-10]

The 12-item Intolerance of Uncertainty Scale (IUS-12) provides a concise assessment of this construct and retains the strong psychometric characteristics of the longer scale.[2] Its two related domains reflect prospective anxiety, characterized by an active desire for predictability, and inhibitory anxiety, characterized by impaired action when uncertainty is encountered. Clinical investigations have supported this two-factor structure across diagnostic groups, although the total score remains useful as an overall index.[5,6] Meta-analytic evidence indicates substantial associations between intolerance of uncertainty and symptoms of several emotional disorders, supporting its interpretation as a transdiagnostic vulnerability rather than a feature unique to one diagnosis.[4,11]

Clinically, the association between intolerance of uncertainty and anxiety severity is important because it identifies a potentially modifiable cognitive process. Prospective research suggests that elevated intolerance of uncertainty can predict the persistence of anxiety-related psychopathology.[12] Moreover, psychological treatments that reduce intolerance of uncertainty are accompanied by improvement in anxiety symptoms, reinforcing its relevance to case formulation and intervention planning.[9,13,14] Nevertheless, the strength of this association can differ across settings, populations, measures, and diagnostic composition. Evidence from Indian clinical services remains comparatively limited, particularly among diagnostically heterogeneous outpatient samples.

The present study therefore aimed to measure intolerance of uncertainty among patients with anxiety disorders and determine its association with clinician-rated anxiety severity. The secondary objectives were to compare total and domain-specific intolerance-of-uncertainty scores across mild, moderate, and severe anxiety categories and to examine whether intolerance of uncertainty remained associated with anxiety severity after adjustment for selected sociodemographic and clinical variables.

MATERIALS AND METHODS

Study design and setting: This hospital-based cross-sectional analytical study was conducted in the Department of Psychiatry, Mamata Academy of Medical Sciences, Bachupally, Hyderabad, Telangana, India. Recruitment and assessment were undertaken from May 2025 to April 2026.

Study participants: Adults aged 18 years or older with a primary anxiety disorder diagnosed by the treating psychiatrist according to standard clinical diagnostic criteria were eligible. Patients were required to be clinically stable and able to understand the study procedures and questionnaires. Patients with a current psychotic disorder, bipolar disorder, substance-dependence syndrome, major neurocognitive disorder, acute suicidal risk, or a medical condition that precluded reliable participation were excluded. Consecutive eligible patients attending the psychiatry service during the study period were invited until the required sample of 100 was attained.

Ethical considerations: Necessary Permissions were obtained before starting the study. Written informed consent was obtained from every participant before enrolment. Participation was voluntary, confidentiality was protected, and study procedures were performed in accordance with the Declaration of Helsinki.

Data collection: A structured case-record form was used to document age, sex, marital and employment status, family history of anxiety disorders, primary psychiatric diagnosis, and duration of illness. Diagnostic information was confirmed from psychiatric evaluation and the clinical record. Assessments were completed in a quiet setting by a trained investigator on the day of enrolment.

Study instruments: Anxiety severity was assessed using the 14-item Hamilton Anxiety Rating Scale (HAM-A), a clinician-administered instrument covering psychological and somatic anxiety symptoms. Each item is scored from 0 to 4, producing a total score from 0 to 56; higher scores indicate greater severity.[7] For descriptive comparisons, scores of 8–17, 18–24, and 25 or higher were categorized as mild, moderate, and severe anxiety, respectively. Intolerance of uncertainty was measured using the IUS-12. Items are rated on a five-point response scale, yielding a total score from 12 to 60. Higher values indicate greater intolerance of uncertainty. The instrument provides prospective anxiety and inhibitory anxiety subscale scores and has demonstrated robust internal consistency and factorial validity.[2,5,6]

Statistical analysis: Data were analysed using a standard statistical software package. Continuous variables were summarized as mean ± standard deviation or median with interquartile range according to distribution; categorical variables were expressed as frequency and percentage. Mean IUS-12 scores across anxiety-severity categories were compared using one-way analysis of variance followed by post hoc pairwise comparisons. Pearson correlation coefficients with 95% confidence intervals quantified the relationships of HAM-A scores with the IUS-12 total and subscale scores. Multiple linear regression was used to examine the independent association between the IUS-12 total score and HAM-A score after adjustment for age, sex, marital status, employment, duration of illness, family history, and primary anxiety-disorder type. Regression coefficients, standardized beta values, and 95% confidence intervals were reported. Model assumptions were

assessed using residual plots and collinearity diagnostics. All tests were two-sided, and P<0.05 was considered statistically significant.

RESULTS

A total of 100 patients with anxiety disorders were included. The mean age was 34.8 ± 10.7 years, and 58 (58.0%) participants were female. Generalized anxiety disorder was the most frequent diagnosis (46.0%), followed by panic disorder (25.0%), social anxiety disorder (18.0%), and other anxiety disorders (11.0%). The median duration of illness was 3.0 years (interquartile range: 1.5–5.0 years). Based on HAM-A scores, 28.0% had mild anxiety, 42.0% had moderate anxiety, and 30.0% had severe anxiety (Table 1).

Table 1. Sociodemographic and clinical characteristics of the participants (N=100)

Characteristic	n (%) or Mean ± SD
Age, years	34.8 ± 10.7
Age group	
18–30 years	39 (39.0)
31–40 years	31 (31.0)
41–50 years	19 (19.0)
>50 years	11 (11.0)
Sex	
Male	42 (42.0)
Female	58 (58.0)
Married	57 (57.0)
Employed	61 (61.0)
Family history of anxiety disorders	29 (29.0)
Duration of illness, years, median (IQR)	3.0 (1.5–5.0)
Primary anxiety disorder	
Generalized anxiety disorder	46 (46.0)
Panic disorder	25 (25.0)
Social anxiety disorder	18 (18.0)
Other anxiety disorders	11 (11.0)
Anxiety severity based on HAM-A	
Mild	28 (28.0)
Moderate	42 (42.0)
Severe	30 (30.0)

SD: standard deviation; IQR: interquartile range; HAM-A: Hamilton Anxiety Rating Scale.

The mean HAM-A score was 23.6 ± 8.2. The mean IUS-12 total score was 35.7 ± 9.4. Mean prospective anxiety and inhibitory anxiety subscale scores were 21.1 ± 5.7 and 14.6 ± 4.8, respectively (Table 2).

Table 2. Anxiety severity and intolerance-of-uncertainty scores (N=100)

Measure	Mean ± SD	Observed range
HAM-A total score	23.6 ± 8.2	8–43
IUS-12 total score	35.7 ± 9.4	14–56
Prospective anxiety subscale	21.1 ± 5.7	8–32
Inhibitory anxiety subscale	14.6 ± 4.8	5–24

HAM-A: Hamilton Anxiety Rating Scale; IUS-12: 12-item Intolerance of Uncertainty Scale; SD: standard deviation.

Intolerance of uncertainty increased progressively with anxiety severity. The mean IUS-12 total score was 26.9 ± 6.1 among patients with mild anxiety, 35.8 ± 6.8 among those with moderate anxiety, and 43.8 ± 6.5 among those with severe anxiety. The overall difference was statistically significant (F=48.63; P<0.001). Post hoc analysis showed that each severity group differed significantly from the other groups (all P<0.001). Prospective and inhibitory anxiety scores demonstrated the same graded pattern (Table 3).

Table 3. Intolerance of uncertainty according to anxiety severity

IUS-12 measure	Mild (n=28)	Moderate (n=42)	Severe (n=30)	F value	P value
Total score	26.9 ± 6.1	35.8 ± 6.8	43.8 ± 6.5	48.63	<0.001
Prospective anxiety	16.2 ± 4.1	21.1 ± 4.2	25.8 ± 3.9	40.01	<0.001
Inhibitory anxiety	10.7 ± 3.1	14.7 ± 3.5	18.0 ± 3.4	34.18	<0.001

Values are presented as mean ± standard deviation. P values were obtained using one-way analysis of variance.

Pearson correlation analysis demonstrated a strong positive association between the IUS-12 total score and HAM-A score (r=0.68; 95% confidence interval [CI]: 0.56–0.77; P<0.001). Both IUS-12 domains were positively correlated with anxiety severity. The correlation was slightly stronger for inhibitory anxiety (r=0.65) than for prospective anxiety (r=0.59), although both associations were statistically significant (Table 4).

Table 4. Correlation between intolerance of uncertainty and anxiety severity

Intolerance-of-uncertainty measure	Correlation with HAM-A score, r	95% CI	P value
IUS-12 total score	0.68	0.56–0.77	<0.001
Prospective anxiety	0.59	0.44–0.70	<0.001
Inhibitory anxiety	0.65	0.52–0.75	<0.001

CI: confidence interval; HAM-A: Hamilton Anxiety Rating Scale; IUS-12: 12-item Intolerance of Uncertainty Scale.

In multiple linear regression, a higher IUS-12 total score remained independently associated with greater anxiety severity after covariate adjustment. Each one-point increase in the IUS-12 score corresponded to a 0.57-point increase in the HAM-A score (B=0.57; 95% CI: 0.43–0.71; P<0.001). Longer illness duration and a family history of anxiety disorders were also associated with higher HAM-A scores. Age, sex, marital status, and employment were not independently associated with anxiety severity. The model explained 52.0% of the variance in HAM-A scores (adjusted R^2=0.48; overall P<0.001) (Table 5).

Table 5. Multiple linear regression analysis of factors associated with anxiety severity

Predictor	B	Standardized β	95% CI for B	P value
IUS-12 total score	0.57	0.65	0.43 to 0.71	<0.001
Age, years	0.04	0.05	−0.07 to 0.15	0.472
Female sex	1.16	0.07	−1.20 to 3.52	0.331
Married status	−0.73	−0.04	−3.05 to 1.59	0.534
Employed status	−1.08	−0.06	−3.42 to 1.26	0.362
Duration of illness, years	0.41	0.15	0.08 to 0.74	0.016
Family history of anxiety disorders	2.48	0.14	0.12 to 4.84	0.040

Dependent variable: HAM-A total score. Model R^2=0.52; adjusted R^2=0.48; overall model P<0.001. CI: confidence interval; IUS-12: 12-item Intolerance of Uncertainty Scale.

DISCUSSION

This study identified a clear, graded relationship between intolerance of uncertainty and clinician-rated anxiety severity in a diagnostically heterogeneous sample. Patients with severe anxiety had substantially higher IUS-12 total and domain scores than those with moderate or mild anxiety. The total IUS-12 score showed a strong positive correlation with HAM-A scores, and the association remained robust after adjustment for demographic and clinical characteristics. These findings support the view that difficulty tolerating uncertain situations is clinically relevant across anxiety presentations rather than being confined to generalized anxiety disorder.

The observed correlation of 0.68 is consistent with earlier evidence linking intolerance of uncertainty to anxiety and related emotional symptoms. Gentes and Ruscio reported substantial associations between intolerance of uncertainty and generalized anxiety, depression, and obsessive-compulsive symptoms, demonstrating that the construct crosses traditional diagnostic boundaries.[4] McEvoy and colleagues similarly found broad transdiagnostic associations, although effect sizes varied by symptom domain and measurement approach.[11] The present findings extend that literature by demonstrating a strong association with clinician-rated overall anxiety severity in routine psychiatric practice.

Generalized anxiety disorder constituted the largest diagnostic group, which is expected because intolerance of uncertainty was originally embedded within cognitive models of pathological worry. Nevertheless, panic disorder, social anxiety disorder, and other anxiety disorders together accounted for more than half of the sample. Previous clinical work found broadly comparable IUS-12 distributions across anxiety and depressive diagnoses, supporting a shared vulnerability model.[5] Associations have also been documented specifically in panic disorder, where uncertainty can intensify catastrophic interpretations of bodily sensations.[8] Thus, intolerance of uncertainty can influence anxiety through different proximal pathways while retaining transdiagnostic importance.

Both IUS-12 domains were associated with HAM-A scores, with a slightly stronger relationship for inhibitory anxiety. Inhibitory anxiety reflects difficulty acting under uncertain conditions and can manifest as freezing, procrastination, or avoidance. These responses can reduce short-term distress while preventing corrective learning, thereby maintaining

anxiety. Prospective anxiety reflects active attempts to obtain certainty through planning, checking, or reassurance seeking. The contribution of both domains suggests that clinical assessment should examine not only anxious anticipation but also behavioural restriction in response to ambiguity.[2,5,6]

The adjusted analysis showed that intolerance of uncertainty remained the dominant correlate of anxiety severity, whereas age, sex, marital status, and employment were not independently associated. Longer illness duration and family history also contributed modestly, potentially reflecting sustained vulnerability or accumulated illness burden. Longitudinal evidence indicates that intolerance of uncertainty predicts subsequent transdiagnostic emotional severity and persistence of anxiety-related problems.[12] Treatment meta-analyses further show that psychological interventions can produce meaningful reductions in intolerance of uncertainty, and improvement in this construct corresponds with reduced symptom severity.[13,14] Screening with a brief measure such as the IUS-12 could therefore enrich cognitive formulation and help identify targets for cognitive restructuring, behavioural experiments, exposure to uncertainty, and reduction of reassurance-seeking or avoidance. Because the present study was cross-sectional, these implications require confirmation through longitudinal and intervention research in Indian clinical populations.

LIMITATIONS

The cross-sectional design prevents determination of temporal sequence or causality. Recruitment from a single tertiary-care psychiatry department limits external validity, while consecutive sampling can introduce referral-related selection bias. Self-reported intolerance of uncertainty remains susceptible to response and social-desirability biases. Diagnostic subgroups were modest, restricting disorder-specific comparisons. Residual confounding from treatment exposure, comorbid depression, socioeconomic conditions, and stressful life events was not fully evaluated.

CONCLUSION

Intolerance of uncertainty was strongly and independently associated with anxiety severity among patients with varied anxiety disorders. Total, prospective, and inhibitory IUS-12 scores increased progressively from mild to severe anxiety, and the association persisted after adjustment for relevant demographic and clinical factors. These findings support intolerance of uncertainty as a clinically meaningful transdiagnostic cognitive characteristic. Incorporating the IUS-12 into routine assessment can complement symptom-based evaluation and clarify patterns of worry, avoidance, reassurance seeking, and behavioural inhibition. Psychological interventions that promote flexible responses to uncertain situations warrant greater attention. Multicentre longitudinal studies should determine directionality, disorder-specific effects, and whether reductions in intolerance of uncertainty predict sustained clinical improvement in diverse Indian populations.

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