

Research Paper

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

Karthiga Elumalai^{1*}, Madhar Shameem²

ABSTRACT

The age of storm and stress doesn't escape the wrath of uncertainty. People feel unequipped when there is lack of certainty, this uneasiness causes them to adopt an unfavourable set of beliefs, adolescents face a handful of uncertain situations all day. This study aims to explore the relationship between intolerance of uncertainty, worry and perceived stress and to assess the effectiveness of psychological intervention on the aforementioned variables among female adolescents. A sample of 120 individuals were selected through convenience sampling to study the relationship between the variables, 30 individuals who have high intolerance of uncertainty were selected and constituted the experimental group for the intervention. Intolerance of uncertainty scale, Penn state worry scale, Perceived stress scale were the scales used. Correlational research design was used to determine the relationship between variables whereas one group pretest posttest experimental research design is adopted to study the impact of the intervention. The findings show that there is a significant relationship between all three variables and the psychological intervention has impacted the levels of intolerance of uncertainty, worry and perceived stress.

Keywords: *Intolerance of Uncertainty, Worry, Perceived stress, Adolescents, Uncertainty Tolerance Training, Intervention For IU*

Adolescence The diversity in an individual's self and culture makes it difficult to define adolescence and its nature. It is challenging to pinpoint the beginning and end of adolescence since there is an intricate play showcased by biological, psychological, cultural and social variables (Schlegel & Barry, 1991). It is crucial to remember that such domains interact, are dynamic, and do not exist alone. Even when it is developing in a healthy way, adolescence may be a difficult time. It can be particularly difficult to define what is "normal" in adolescent development because of this and the large amount of individual diversity in teenage development (Hazen et al., 2008). Adolescence is a time of identity development and detachment from adult carers says Erikson (1963). It is inevitably a time of transition where there is significant uncertainty waiting to be experienced.

¹M.Sc Counselling Psychology, Madras School of Social Work

²Assistant Professor, Madras School of Social Work

*Corresponding Author

Received: April 03, 2024; Revision Received: June 16, 2024; Accepted: June 21, 2024

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

Uncertainty

Humans are capable of learning more about an idea or phenomenon based on the resources at our disposal. Investigation of some occurrences results in the discovery of the causes and effects related to their action. However, there are some factors over which we have no control. In certain circumstances, it might not be possible to draw conclusions based on the information at hand. Uncertainty is the inability to forecast or foretell occurrences or acts. We feel the urge to learn more about our own selves in numerous life areas as people residing in a society. This entails a desire to learn more about impending occasions and circumstances that are relevant to our own life.

Uncertainty Identity theory examines the motivational role of self uncertainty in group dynamics and how group identification reduces ambiguity significantly (Hogg, M. A., 2017). Whereas Uncertainty reduction theory claim that it is human drive for one to be certain and that they even involve in self disclosures to reduce the tension and level of certainty, thereby creating a comfort zone (Costa, 2015)

Psychologist Paul K. J. Han has identified three types of uncertainties, they are: complexity, ambiguity, and probability. In probability, the degree of risk associated with a situation is undeterminable, Whereas in ambiguity, there is a severe lack in credible information and in the last type, complexity, there is a challenge in comprehending the situation because of its intricate nature.

Intolerance of Uncertainty

People tend to feel unequipped when there is lack of information regarding something or when there is no sense of certainty. The need to prepare themselves with relevant resources and knowledge is developed in such cases. When the possibility of becoming certain about a particular phenomenon is less, the inadequacy fosters anxious feelings. This unfavourable set of attitudes or thoughts towards uncertainty may be referred to as Intolerance of uncertainty. Buhr & Dugas (2009, p. 216) define Intolerance of uncertainty (IU) as “a dispositional characteristic that results from a set of negative beliefs about uncertainty and its implications and involves the tendency to react negatively on an emotional, cognitive, and behavioural level to uncertain situations and events” (Boswell et al., 2013). While uncertainty is the phenomenon, intolerance of uncertainty refers to one’s response to uncertainty. Therefore, IU is the combination of cognitive, emotional, behavioural as well as psychological reactions and responses to the circumstance.

Manifestation of IU

On the cognitive level, the individual who is intolerant of uncertainty may have thought patterns that have a pessimistic attribution towards the expectation of future outcomes. When there is a lack of an assuring route map without solid information, the individual is more likely to foresee the worst-case scenario of a situation at hand. The emotional aspect involved in IU may involve the presence and experience of negative emotions to a larger extent as compared to the positive ones. Behavioural manifestations of the intolerance of uncertain circumstances may project the intense emotions that are experienced. The need to express the emotion that is experienced is thus carried out through actions and behaviours. These behaviours often seem to be unhealthy and non-productive ones which cause damage to self as well as others. On the other hand, uncertainty may also paralyse an individual from acting upon a situation. The lack of information may tend to block the vision that they have in plan. When the predicted events do not occur, and unanticipated ones happen instead, flexibility to

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

shift focus from the previous framework that was constructed may not take place immediately. Adapting to such a situation with the availability of current resources may tend to block them from taking actions towards their goals.

History of IU

Initially studies on anxiety gave rise to the concept of “Intolerance of uncertainty”. All anxiety disorders are underpinned by this core fear, which is distinct from the emotional experiences brought on by anxiety. Anxiety is future-focused and generally uncertain, whereas fear is present-focused and relatively certain. The conceptual model of fear centres on uncertainty, which breeds worry and anxiety. Years of research on uncertainty form the basis of the concept of intolerance of uncertainty (Gu, Y., 2020). Uncertainty, as opposed to predictability and uncontrollability, is a broader and more inclusive notion that can apply to all types of unknown and be defined in a variety of research disciplines. Fear, anxiety, and worry have been noted to arise in reaction to uncertainty before the IU construct was published. Researchers found that distinct emotional reactions are influenced by the degree of perceived uncertainty: fear is linked to future threats that are less uncertain, while anxiety is linked to threats that are more uncertain (Gu, Y., 2020). Earlier studies have found a strong correlation between intolerance of uncertainty and worry in both clinical and nonclinical groups. The foundation of worry, according to the complete definition, is in beliefs that uncertain future events will be bad and cause uneasiness.

Definitions of IU and worry show that these two concepts have a lot in common when it comes to future uncertainty and maladaptive behaviours brought on by that uncertainty. It is not surprising that IU can differentiate participants with generalised anxiety disorder (GAD) from healthy controls given that pathological worry is the defining feature of the condition (Gu, Y., 2020). Researchers looked into the specificity of the connection between IU and anxiety and discovered that IU was more strongly associated with worry than to obsessions/compulsions and panic attacks (Gu, Y., 2020).

Worry

The cognitive or thinking aspect of anxiety that every person experiences is worry. It is composed of anxious thoughts about potential, actual, and ongoing events; in other words, it is composed of anxious thoughts about the present, the past, and the future. Worry is a series of unsettling thoughts and images that tends to spiral out of control. It entails an effort to engage in mental problem-solving on a matter whose outcome is uncertain but could result in one or more undesirable outcomes. Hence, the worry process is intimately related to the fear process. (Borkovec et. al., 1983). Although worry can help to solve problems, some believe that excessive worrying will prevent what they fear from coming true. Individuals also tend to underestimate how well they would actually cope when the feared events actually occur. Their lives have been characterised by constant concern and the accompanying emotions of anxiety for weeks, months, or even years. This worry persists even when there are no stressful situations. The worry is often accompanied by such symptoms as feeling keyed-up, being on edge or restless, feeling easily fatigued, having difficulty sleeping or concentrating, excessive muscle tension, and irritability.

Faulty beliefs about Worry

People carry a lot of faulty beliefs regarding worry and its usefulness. They believe that worry motivates them and helps them solve problems and they also assume that worry keeps them prepared for the worst and if they constantly worry about something then that terrible

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

thing will not occur. One short-term benefit of worry is that it tends to suppress some of the bodily symptoms of anxiety. Nevertheless, it also hinders the capacity to emotionally absorb the (expected) occurrence, decreasing the likelihood of a constructive solution. The person who worries a lot gets caught up in these anxious thoughts and has fewer resources for the task at hand during those times, which is the self-fulfilling prophecy component. A worrier starts ignoring information that is contradictory with their perspective, which is already overly pessimistic, and concentrating more on facts or information that supports their perspective. Such irrational beliefs are the factors that maintain the worry and keep producing such thoughts.

Stress

The World Health Organization has termed "stress" the "Health Epidemic of the 21st Century", it has terrible impact on both our physical and emotional well-being. In behavioural science, Stress is defined as "the perception of threat with accompanying anxiety discomfort, emotional tension, and difficulty in adjustment". Stress between 1983 and 2009 levels rose 10–30% across the board for all demographic categories. And after the pandemic, one need not say the amount of stress that has been added into our daily life due to changes in the work system, economic state and the uncertain nature they are living in.

Perceived Stress

Perceived stress is the individual's perception about how much stress they are under at the specific point in time or over a span of time. Perceived stress includes thoughts about how unpredictable and uncontrollable one's life is, how frequently one needs to deal with annoying hassles, how much change is taking place in one's life, and confidence in one's capacity to handle issues or problems. It measures how a person feels about how difficult their life is overall and their capacity to handle stress, rather than the sorts or frequency of stressful events that have happened to them. Similar traumatic life events may affect people differently, but this depends on a variety of characteristics, including personality, coping mechanisms, and social support. The interaction between a person and their environment that they view as threatening or overloading their resources in a way that will affect their wellbeing is reflected in perceived stress in this way (Lazarus & Folkman, 1984). A questionnaire like the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) is frequently used to quantify perceived stress as the frequency of these feelings.

According to studies, in this era of social media and 24-hour news cycles, our perceptions of stress have become more negative. We are constantly bombarded with images and stories of violence, crime, natural disasters, and political turmoil. This can lead to feelings of fear and anxiety. In fact, people try to avoid stressful situations, but this isn't always possible. We can't always control what happens to us, but we can control how we react to it. Our perception of a situation is what determines our stress response.

Need of the study

After the pandemic, the world has begun to function normally but the effect of the massive change that we underwent have affected us in numerous ways, one such is our attitude towards uncertainty. Students have been forced to a situation where they have to constantly shift their entire mode of education from offline to online and when they have settled with the latter, the world began to function in its new normal way and the offline education became the usual again. Being thrown into the tempest, it is important to gather their views about uncertainty and related variables that have a negative effect on students' well being.

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

This study will bring light on the levels of Intolerance of uncertainty among adolescents and how much it affects their daily life. It also aims to understand its relationship with perceived stress and worry. This research will try understanding the effect of a psychological intervention on these variables among the mentioned population. This research will add insights to the existing literature body related to the variable and will aid future studies in this area. It will act as a little foundation for future researchers to try understanding the effect of any psychological intervention based on IU to help the mentioned population by exploring ways to deal with ambiguity and uncertainty.

REVIEW OF LITERATURE

Audhi Haung et al. (2023) conducted a study to investigate the mechanisms underlying **the relationship between intolerance of uncertainty and anxiety in college students in non-epidemic areas during the periods of re-emergence of COVID-19**. The results indicated that IU had a positive correlation with anxiety. After controlling for gender and age, results indicated that catastrophizing mediated the relationship between IU and anxiety, and family function acted as a moderator. It was also found that IU directly impacted anxiety and had indirect effects on anxiety by catastrophizing.

Bottesi G et al. (2023) conducted a study on **preliminary evaluation of effectiveness for a transdiagnostic group intervention focusing on intolerance of uncertainty**. After a group intervention for 8 weeks, the researchers found that levels of perceived uncertainty and associated distress have decreased and confidence to tolerate uncertainty has increased. Self report scores showed a significant decrease in scores of IU and general distress.

Kristin E M (2023) conducted a study that **examined the relationship between intolerance of uncertainty and worry among adolescents**. The results indicate that worry has a strong relationship with intolerance of uncertainty and supports the idea that intolerance of uncertainty is an important construct involved in worry.

Peter Felsman et al. (2023) worked on the research which aims to find whether **intolerance of uncertainty changes with participation in improvisational theatre class for adolescents**, and whether that change can explain changes in social anxiety. Participating in the program was associated with significant reductions in social anxiety and intolerance of uncertainty and results also indicated change in intolerance of uncertainty was associated with greater reductions in social anxiety. This study provides the first evidence that participating in improvisational theatre could be a way of accessing mental health intervention with low mental stigma attached and can yield desirable results.

Amanda Marin and Aliza Panjwani (2022) studied the **relationships between Intolerance of Uncertainty, Worry, Rumination, and Distress in College Students During the Coronavirus Pandemic**. The results indicated that intolerance of uncertainty has a direct effect on coronavirus anxiety and the strongest effect was reserved for those who perceived the pandemic as highly threatening. IU exhibited an indirect effect on depressive symptoms of the participants through rumination.

Hatice Odani et al. (2022) and her colleagues undertook a study that aimed to investigate **the mediating role of educational stress in the relationship between intolerance of uncertainty and academic life satisfaction among teenagers**. The results of the analysis showed that teens' academic life satisfaction is impacted by their intolerance of ambiguity

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

both directly and indirectly through educational stress. Teenagers' tendency to the uncertainty they faced during the COVID-19 epidemic and increased levels of educational stress was detrimental to their academic life satisfaction.

Seyhan Cankaya & Tugba Ibrahimoglu (2022) conducted a case control study with the aim to **examine the stress, anxiety, intolerance of uncertainty, and psychological well-being of pregnant women with and without threatened miscarriage**. Results indicated that stress, anxiety, and uncertainty of pregnant women with threatened miscarriage were considerably higher, and their psychological well-being was adversely affected when compared to controls.

Humaira and Naz (2022) investigated the **interrelationship among mindfulness, intolerance of uncertainty and affective lability among samples with histrionic personality disorder** along with the aim to investigate the moderation role of mindfulness in the mentioned variables. The study found that mindfulness has significant negative correlation with intolerance of uncertainty and affective lability; mindfulness is found to be a significant negative moderator in the association between affective lability and intolerance of uncertainty among individuals with features of histrionic disorder.

Goyal and Sharma (2022) had an objective to explore **the effect of this pandemic on Indian adolescent's emotion and cognition through studying the association between intolerance of uncertainty and decision making during covid-19**. Results indicate significant positive relationship between fear of covid-19, intolerance of uncertainty and maladaptive decision making. Mediation analysis yields two results, IU mediated relationship between fear of covid-19 and maladaptive decision making, fear of covid-19 mediates the relationship between intolerance of uncertainty and maladaptive decision-making patterns.

Sun, Li and Kwok (2022) aimed to investigate **The Relationship between Intolerance of Uncertainty and Problematic Social Media Use during the COVID-19 Pandemic**. Fear of missing out, maladaptive coping mechanisms, and intolerance of uncertainty were all positively correlated with PSMU. The direct impact of intolerance of uncertainty on PSMU was considerable even after controlling for age and gender. Also substantial was the overall indirect effect. Maladaptive coping mechanisms and the fear of losing out mitigated the impact of intolerance of uncertainty on PSMU. When considered collectively, unhealthy coping mechanisms and FOMO served as a mediator between intolerance for uncertainty and PSMU. This result implies that strategies aimed to improve tolerance of uncertainty and reduce fear of missing out along with usage of relevant coping strategies would be helpful in tackling problematic social media usage especially in pandemic.

In a study published in 2021, **Bakioglu et al.** sought to understand **the mediating effects of depression, anxiety, stress, and intolerance of uncertainty on the link between COVID-19 fear and optimism**. The result indicated that intolerance of uncertainty, depression, anxiety, and stress has a positive relationship with Fear of COVID 19 and plays a mediating role in the relationship between the fear of COVID-19 and positivity.

Gang Du and Houchao Lyu (2021) conducted a study on **mediating role of perceived social support and the mediating effect of intolerance of uncertainty relationship between future expectations and internet addiction among teenagers**. The findings

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

showed that future expectations were strongly negatively correlated with internet addiction, with adolescent intolerance of uncertainty as a mediating factor. Furthermore, the relationship between future expectations and intolerance of uncertainty was moderated by perceived social support. The association was significant only for adolescents with a higher level of perceived social support.

Rebecca Mallett et al. (2021) compared the **contribution and relations of three factors namely Contextual factors, cognitive appraisal and psychological flexibility (PF) to anxiety and wellbeing during the pandemic**. Under cognitive appraisal, Perceived vulnerability to disease (PVD) and Intolerance of uncertainty (IU) was studied. Results indicated IU and PF predicted mental health, while PVD, IU and PF predicted state anxiety. Contextual factors also predicted state anxiety and wellbeing, although not all of them. The results offer credence to the PF model and cognitive appraisal theories, as well as to an acceptance and commitment therapy (ACT) strategy for public health during pandemics.

Dan Wu (2021) explored the **association between perceived stress, COVID-19 uncertainty, intolerance of uncertainty, and overall sleep state among Chinese people during the early stage of the outbreak in 2020**. General sleep condition was substantially correlated with age, residence, ethnicity, marital status, infection, and quarantine status. Higher intolerance for uncertainty was significantly positively linked with greater COVID-19 uncertainty. The association between COVID-19 uncertainty and overall sleep status was found to be mediated by perceived stress, according to the mediation analysis. However, IU did not significantly mediate the association between sleep and COVID-19 uncertainty.

Engin Deniz (2021) studied the association between **self-compassion and wellbeing and the mediation effects of intolerance of uncertainty and dread of COVID-19**. The findings demonstrated a substantial relationship between self-compassion, intolerance of uncertainty, fear of COVID-19, and wellbeing. Additionally, people with increased self-compassion reported less intolerance for uncertainty, which in turn reduced perceived anxiety of the COVID-19 and impaired wellbeing. The findings are explored in relation to COVID-19 and the literature on wellbeing, and theoretical and practical implications are also given.

Gamze Fiskin (2021) conducted a study to measure the **emotional responses of pregnant women to the pandemic**. The levels of perceived stress and intolerance to uncertainty were high among pregnant women. The pregnant women who reported feeling mild hopelessness showed a moderately positive correlation between their stress and uncertainty levels. It is advised that during the pandemic, health providers identify risk populations and give the necessary psychological assistance.

Rehman Shanza et al. (2021) conducted a study on the relationship **between people' intolerance of uncertainty, religion, and psychological well-being**. Results indicate that intolerance of uncertainty has a highly significant relationship with religiosity and psychological well-being, whereas religiosity has a large positive relationship with psychological well-being. The findings also showed that religiosity and intolerance of uncertainty were important predictors of psychological well being.

Angehrn A et al. (2020) conducted a study titled **The Impact of Intolerance of Uncertainty and Anxiety Sensitivity on Mental Health Among Public Safety Personnel: When the Uncertain is Unavoidable**. PSP without mental disorders reported lower IU and

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

AS than all other groups, while PSP with positive screens for mental illnesses reported lower IU and AS than clinical samples. Reasons for PSP showing low levels of IU and AS despite higher frequency of mental disorders may be explained by increased resilience or the development of coping abilities to manage frequent exposures to uncertain situations.

Kendall (2020) reviewed a number of papers in order to analyse and determine **predictors of varied outcomes of cognitive behavioural treatment for paediatric anxiety**. As important objectives for individualised intervention, they recognised and discussed the roles of parental accommodations and intolerance of uncertainty. Increased IU and high levels of parental accommodation, according to numerous recent studies, are linked to a worse response to CBT. Several investigations have used these identified characteristics as the focal point for their CBT intervention and have shown noteworthy outcomes.

Layla Mofrad (2020) published a study that aimed to gain an **overview of a transdiagnostic model of IU**. After intervention, the findings revealed that 16 individuals (80%) demonstrated reliable change on a measure of sadness or anxiety, while nine participants (45%) demonstrated reliable change in IU following the group. Universality, tolerance, and acceptance, as well as the manifestation of IU in the group process, were found as important themes using a thematic analysis.

Paul Boelen et al. (2020) studied the **intolerance of uncertainty (IU) among young adults**. The results showed that the IUS-12 had the IU components known as Prospective Anxiety and Inhibitory Anxiety. Additionally, IU was more strongly linked with worry and social anxiety than depression after controlling for the shared variation between these variables, Negative Affectivity, age, and gender. Lastly, IU and its two parts. Finally, IU and its 2 components were found to mediate the linkages of Negative Affectivity with social anxiety and worry.

Begum Satici (2020) undertook a study on **the relationship between intolerance of uncertainty and mental wellbeing** and checked whether this relationship was mediated by rumination and fear of COVID-19. Results showed that intolerance of uncertainty had a significant direct effect on mental wellbeing. Rumination and fear of COVID-19, both together, serially mediated the association between intolerance of uncertainty and mental wellbeing.

Tove Wahlund (2020) investigated **the feasibility, acceptability, and preliminary efficacy of IU-focused cognitive behavioural therapy (IU-CBT) for adolescents who worry excessively**. After weekly sessions and self guided exposure, Significant drops in self-reported worry, anxiety, depressive symptoms, IU, and parent-reported worry were noted, as well as significant gains in overall functioning. At post treatment, 58.3% of patients were rated by clinicians as significantly or very significantly improved, and this number increased to 66% at the 3-month follow-up. Treatment was more effective for those with generalised anxiety disorder (GAD) than for those with social anxiety disorder.

Eleni Parlapani et al. (2020) undertook a study with the aim of **examining older persons' psychological reactions during the pandemic's acute phase in Greece**. Women reported significantly higher degrees of intolerance for uncertainty, more severe depression symptoms, and sleep difficulties than men did. Participants who were single displayed greater levels of loneliness.

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

Brooke Smith (2020) conducted a study on **psychological flexibility and related concepts that influence correlations between social isolation and mental health outcomes during the COVID-19 pandemic**. There are statistically significant relationships between social isolation and psychological distress (depression, anxiety, and stress), wellbeing, and valued living, according to a series of hierarchical linear regression studies. In a handful of cases, psychological inflexibility, intolerance of uncertainty, and emotional repression considerably moderated these correlations.

Woo and Hyun (2020) investigated the **mediating effect of self compassion in the relationship between intolerance of uncertainty and worry among young adults**. Results show that self compassion partially mediates the relationship between IU and worry. Adding to this, the most effective mediator was found to be self kindness and common humanity. Based on these findings, the researchers concluded that self compassion is a crucial element to deal with when aiming to treat pathological worry or generalised anxiety since both deal with worry and intolerance of uncertainty.

Demirtas et al. (2019) studied **relationships among hopelessness, cognitive flexibility, intolerance of uncertainty, and perceived stress**. The results of this study indicated that hopelessness is negatively correlated with cognitive flexibility and positively correlated with intolerance of uncertainty and perceived stress. Cognitive flexibility has a negative relationship with intolerance of uncertainty and perceived stress; positive correlation between intolerance of uncertainty and perceived stress was identified. The mediational role exhibited by cognitive flexibility and intolerance of uncertainty in the relationship between hopelessness and perceived stress is also statistically significant.

Analysis of the review and Rationale

The above mentioned body of research subsumes a broad range of topics, such as intolerance of uncertainty, anxiety sensitivity, perceived stress, worry, hopelessness, cognitive flexibility, social anxiety, rumination, psychological well being, academic satisfaction, self compassion. It is important to notice that every study mentioned above has a different objective, methodology and sample size, has a distinct approach and limitations. This certainly affects the applicability of the results. Notice needs to be paid to the fact that most of the studies here have a distinctive target population ranging from adolescents to pregnant women to geriatric population and the sample used hinder generalisations yet they give precious information about that specific population's state with regards to the studied variables.

A synthesis of aforementioned correlational study indicated that intolerance of uncertainty is positively correlated with various factors that negatively affect an individual's well being, irrespective of what population it is. From the review of literature related to IU, it was also observable that religiosity, self-compassion, and cognitive flexibility have negative correlation with intolerance of uncertainty.

A major highlight from this bunch of studies is that the majority of the research relevant to IU has been conducted during the pandemic. Many research scholars have taken interest in this variable when the whole world was in an uncertain situation and was witnessing novel situations which were handled differently by people with varied tolerance levels. This is considered as a boon for my research as it gives recent data about my variables of interest, but at the same time, it is quite stunning to see that a psychological construct of this importance has not been vigorously studied before the pandemic. Majority of the intervention

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

studies that focus on intolerance of uncertainty has been effective in bringing about the change that was expected by the researchers.

Collectively, we can observe the close knit nature of intolerance of uncertainty with worry, perceived stress, anxiety and psychological well being, and the success of intervention studies have given the confidence that IU is an important target for devising plans and models to enhance the well-being of individuals. This research aims to evaluate the effectiveness of a psychological intervention that can be used for non clinical population, specifically female adolescents with an aim of reducing their intolerance of uncertainty, worry and perceived stress.

METHOD OF INVESTIGATION

Problem statement

Are intolerance of uncertainty, worry and perceived stress related? Can psychological intervention have an impact on intolerance of uncertainty, worry and perceived stress among female adolescents?

Aim

To explore the relationship between intolerance of uncertainty, worry and perceived stress and to assess the effectiveness of psychological intervention on intolerance of uncertainty, worry and perceived stress among female adolescents.

Objectives

- To assess intolerance of uncertainty among female adolescents
- To study the relationship between intolerance of uncertainty, worry and perceived stress among female adolescents
- To determine the effectiveness of the psychological intervention on Intolerance of uncertainty among female adolescents and its impact on worry and perceived stress

Hypotheses

- H1: There will be a significant relationship between intolerance of uncertainty and Stress among female adolescents
- H2: These will be a significant relationship between intolerance of uncertainty and worry among female adolescents
- H3: There will be a significant relationship between worry and perceived stress among female adolescents
- H4: There will be no significant difference in intolerance of uncertainty between pre-test and post-test of experimental group
- H5: There will be no significant difference in worry between pre-test and post-test of the experimental group
- H6: There will be no significant difference in perceived stress between pre-test and post-test of the experimental group

Conceptual definition

Intolerance of uncertainty is the tendency of an individual to consider the possibility of a negative event occurring unacceptable, irrespective of the probability of occurrence (Carleton, Norton, & Asmundson, 2005)

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

Worry is a chain of thoughts and images, negatively affect-laden and relatively uncontrollable. It represents an attempt to engage in mental problem-solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes. Consequently, worry relates closely to the fear process. (Borkovec, Robinson, Pruzinsky and DePree, 1983)

Perceived stress refers to the degree to which events in a person's life are assessed as stressful, unpredictable and uncontrollable (Cohen, Kamarck, & Mermelstein, 1983; Phillips, 2012).

Operational definition:

Intolerance of uncertainty is the discomfort and difficulty a person feels with tolerating the unknown or ambiguous situation, it is the incapacity to endure the aversive response triggered by the perceived absence of salient, key or sufficient information and sustained by the associated perception of uncertainty.

Perceived stress is the feelings or thoughts that an individual has about how much stress they are under at a given point in time or over a given time period. It is not measuring the types or frequencies of stressful events which have happened to a person, but rather how an individual feels about the general stressfulness of their life and their ability to handle such stress.

Worry is a chain of thoughts and images, negatively affect-laden and relatively uncontrollable. It represents an attempt to engage in mental problem-solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes.

Research Design

The current study adopts a correlational research design to test the relationship between the variables and a single group pre-post test experimental research design to determine the impact of psychological intervention that focuses on uncertainty tolerance on intolerance of uncertainty, worry and perceived stress among female adolescents.

Sample

The sample consists of 120 female adolescents and convenience sampling is adopted. After the screening, Convenience sampling technique was adopted to assign the samples (N=30) in the experimental group for the intervention.

For the purpose of the psychological intervention, there exists an inclusion criteria where each sample must satisfy the following conditions:

- Those who scored higher than 40 in intolerance of uncertainty scale

Tools used

Intolerance of uncertainty scale (IUS). The IUS - 12 developed by Carleton, Norton, & Asmundson, is a short version of the original 27 item questionnaire that measures response to uncertainty, ambiguous situation, and the future. The intolerance of uncertainty scale - short form (IUS -12) has a strong correlation with the original scale, $r = .94$ to $.96$, a continuous latent structure, and has been shown to have two factors, prospective IU (7 items e.g., "I can't stand being taken by surprise") and inhibitory IU (5 items; e.g., "when it's time to act, Uncertainty paralyzes me"), both with identically high internal consistency, $\alpha = .85$ (Carleton, Norton, et al., 2007). Psychometrics suggest good convergent and discriminant

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

validity, as well as internal consistency, have been demonstrated by the total score and both subscale scores (Carleton, Norton, et al., 2007).

Scoring. The 12 item scale is rated on a 5 point likert scale ranging from 1 (Not at all characteristic of me) to 5 (entirely characteristic of me). The interpretation of the total is higher the score obtained, higher the intolerance of uncertainty.

Penn State Worry Questionnaire. The Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) consists of 16 items scored on a 1-5 point scale. To construct the PSWQ, a pool of 161 items was thought to be related to the construct of worry. These items were provided in questionnaire form to 337 college students in an introductory psychology class. Factor analyses and internal consistency calculations led to the deletion of numerous items and ultimately yielded the 16-item scale. The coefficient alpha for the final PSWQ was 0.93. The final scale was subsequently presented to numerous additional samples of introductory psychology students. It was determined that the PSWQ showed strong test-retest reliability as well as validity. It correlates reliably with various psychological measures reasonably connected to worry, and does not correlate with other measures that are less relevant to the construct.

Scoring. This measure consists of 16 items (e.g., “Many situations make me worry.”) and is used on a 5-point Likert scale from 1 (“not at all typical of me”) to 5 (“typical of me”) to evaluate engagement of worry and absence of worry. Items 1, 3, 8, 10, and 11 must be reverse coded and a greater score in this scale indicates a greater level of worry. Scores range from 16 to 80 with higher scores indicative of higher levels of trait worry.

Perceived stress scale. The PSS-10 is a 10-item self-report measure of global perceived stress. A total score ranging from 0 to 40 is computed by reverse scoring the four positively worded items and then summing all the scale items. Higher scores indicate greater levels of perceived stress. The psychometric properties of the PSS-10 were originally evaluated in a large national sample of 2,387 American adults. Cohen and Williamson (1988) reported that scores on the PSS-10 demonstrated adequate internal consistency reliability ($\alpha = .78$); moderate concurrent criterion validity with the amount of stress experienced during an average week ($r = .39, p < .001$) and the frequency of stressful life events within the past year ($r = .32, p < .001$); and adequate convergent validity as evidenced by expected negative associations with perceived health status ($r = -.22, p < .001$) and positive associations with psychosomatic symptoms ($r_s = .28$ to $.34, p < .001$) and health service utilisation ($r = .22, p < .001$). Since then, other studies have similarly reported that the PSS-10 has good internal consistency, reliability, and adequate convergent validity based on associations with measures of physical and mental health.

Scoring. The 10 item scale is rated on a 5 point likert scale ranging from 1 (Never) to 5 (very often). The interpretation of the total is higher the score obtained, higher the intolerance of uncertainty. The questions in this scale ask about an individual's feelings and thoughts during the last month. Higher the score reflects higher the perceived stress of an individual.

Statistical techniques

Pearson's product moment correlation was used to analyse the relationship between intolerance of uncertainty, worry and perceived stress. The paired sample t-test was used to assess the difference between pre-test and post-test of the experimental group with respect to all the three above-mentioned variables.

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

Data collection process

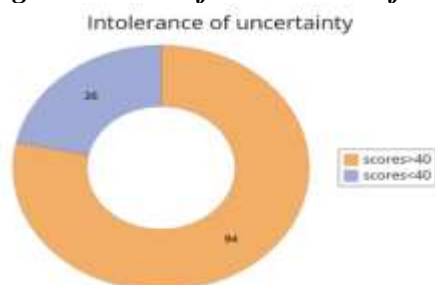
The sample consists of female adolescents whose age lies between 11 to 19. Data was gathered by approaching a school and explaining the purpose of the study to the management. Through convenient sampling, a lot of students were approached and among them a total of 120 students accepted to be a part of the study. Before the data was collected from the participants clear and precise instructions were provided. It included the significance of confidentiality, procedures and instructions for each of the assessments. Any doubts and clarifications that the participants had were encouraged to be clarified right that moment. After this, thirty students who had high scores on intolerance of uncertainty scale were selected through convenient sampling. After obtaining their informed consent, the intervention began. The intervention spanned over a week and after two weeks, the post-test data was collected.

Intervention Plan

In a nutshell, the intervention module begins with Building rapport, orienting about the intervention and contracting, then proceeds to discussing uncertainty and its intolerance, psychoeducation about how uncertainty manifests, Debriefing about uncertainty tolerance, debunking myths and accepting uncertainty. It also includes worksheets about challenging uncertainty, journaling anxious thoughts and psychosomatic grounding.

RESULTS AND DISCUSSION

Figure 1 Level of intolerance of uncertainty among the sample



The figure 1 divides the sample into two groups based on their scores in intolerance of uncertainty scale (IUS). From the chart above, it is observable that 94 individuals out of 120 have scored more than 40 in the IUS and 26 have scored lower than 40. The interpretation of the scale indicates that the more the score, the more intolerant the individual is towards uncertainty. It can be inferred that 78% of the sample have scored in the higher end of the scale and it indicates that they have difficulties adjusting or tolerating ambiguities and uncertainties in their life.

From that 78% (94 individuals) 30 individuals were selected through convenience sampling and were considered as an experimental group, to whom the intervention was given.

Table 1 Normality test

Variable	Statistics	Degrees of Freedom	Significance
Intolerance of uncertainty	0.080	119	0.058
Worry	0.058	119	0.200
Perceived stress	0.072	119	0.084

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

From table 1, we can infer that all variables have significance higher than 0.05 in Kolmogorov Smirnov test which indicates that these variables are normally distributed.

Table 2 Relationship between intolerance of uncertainty, worry and perceived stress among female adolescents

	Intolerance of uncertainty	Worry	Perceived Stress
Intolerance of uncertainty	1	.429**	.440**
Worry	.429**	1	.415**
Perceived stress	.440**	.415**	1

** Correlation is significant at the 0.01 level (2-tailed).

From table 2, it can be inferred that intolerance of uncertainty has a significant positive relationship with worry, $r(118) = 0.429$, $p < 0.001$. Hence the alternate hypothesis, “*there will be a significant relationship between intolerance of uncertainty and worry*” is accepted. This result supports the study conducted by Kristin (2023) in which the results state that there is a significant positive relationship between these two variables. This significant relationship could be a manifestation of the fact that both the variables are central qualities of generalised anxiety disorders and this condition is more prevalent in women than men.

Table 2 also indicates that intolerance of uncertainty has significant positive correlation with perceived stress, $r(118) = 0.440$, $p < 0.001$. Therefore, the alternate hypothesis, “*there will be a significant relationship between intolerance of uncertainty and perceived stress*” is accepted. A study conducted by Demirtas et al. (2019) has produced similar results stating that there is a significant positive relationship between perceived stress and intolerance of uncertainty.

The relationship between perceived stress and worry is also depicted in table 2 and from that it can be inferred that these two variables share a significant positive relationship, $r(118) = 0.415$, $p < 0.001$. Therefore, the alternate hypothesis, “*there will be a significant relationship between worry and perceived stress*” is accepted.

Table 3 Paired sample t test for intolerance of uncertainty

Test	N	Mean	Standard Deviation	t	Sig. (2 tailed)
Pre-test	30	46.57	4.014		
Post test	30	38.70	8.330	5.693**	.000

** Significant at the 0.01 level (2-tailed)

The above table shows the experimental group’s mean, standard deviation and the difference in Intolerance of Uncertainty before intervention and after intervention. A paired sample t test was performed to compare intolerance of uncertainty in pretest and posttest. Before intervention, the mean of the experimental group is 46.57 with a standard deviation of 4.014. The mean of the participants after intervention is 38.70 with a standard deviation of 8.330.

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

The calculated t value is 5.693 and there is a significant difference at 0.01 level of significance. Therefore, There is a significant difference in intolerance of uncertainty between pretest (M = 46.57, SD = 4.014) and Posttest (M = 38.70, SD = 8.330); $t(29) = 5.693$, $p < 0.001$.

From the mean, it is inferred that the intolerance of uncertainty in the experimental group has decreased after the intervention. This indicates that intolerance of uncertainty is not a fixed trait, it can be altered i.e., reduced; With intervention that focussed on educating the individuals, helping them find healthy ways to deal with uncertainty and teaching them relaxation techniques the participants were able to deal better with uncertainty and their intolerance of uncertainty levels have gone down.

This finding supports various studies conducted by Bottesi (2023), Tove (2020) and Mofrad (2020) which indicates that interventions, both group and individual, that focus on Intolerance of uncertainty have shown significant decrease in scores of IU of the participants. These studies have concluded that the primary evaluation supports the effectiveness of intervention that focus on IU.

Hence, from the above table, the null hypothesis, “*There will be no significant difference in levels of intolerance of uncertainty between pre and post test*” is rejected.

Table 4 Paired sample t-test for worry

Test	N	Mean	Standard Deviation	t	Sig. (2 tailed)
Pre-test	30	53.73	12.194	2.408*	.023
Post test	30	50.13	13.400		

*. *significant at the 0.05 level (2-tailed).*

Table 4 indicates the mean of the participants of the experimental group on Worry before intervention to be 53.73 with a standard deviation of 12.194. After intervention, the mean has gone down to 50.13 with a standard deviation of 13.400. The calculated t value is 2.408 and is significant at 0.05 level of significance. Therefore, There is a significant difference in worry between pretest (M = 53.73, SD = 12.19) and posttest (M = 50.13, SD = 13.40); $t(29) = 2.408$, $p < 0.05$.

This indicates that the intervention that focussed on intolerance of uncertainty has resulted in significant decrease in the worry levels of the experimental group. From prior research and theories, it is evident that people who are intolerant towards uncertainty have also faced worry as a consequence, the dissatisfaction with uncertainty gives rise to the warrior’s classic “what if..” thoughts, this relationship helps in reasoning the obtained result.

The following study conducted by Tove Wahlund (2020) supports the finding that intervention focussing on IU has an effect on worry levels of the participants. The result of the study conducted in 2020 indicates that with self guided exposure and one on one sessions with therapist, there was a significant drop in the participant’s level of self reported worry, anxiety, depressive symptoms and intolerance of uncertainty, and therefore it is concluded as IU focused intervention is acceptable and feasible for adolescents with excessive worry.

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

Therefore, helping the individuals with tolerating uncertainty have in turn decreased the worry levels among the participants of the experimental group. Thus, it can be said that there is a significant difference in worry levels of the experimental group at 0.05 level. Therefore, the hypothesis, “*there will be no significant difference in the level of worry*” is rejected.

Table 5 Paired sample t-test for perceived stress

Test	N	Mean	Standard Deviation	t	Sig. (2 tailed)
Pre-test	30	24.37	3.792		
Post test	30	22.23	5.054	2.818**	.009

** Significant at the 0.01 level (2-tailed)

From the table, it is observed that the mean of the participants of the experimental group before the intervention to be 24.37 with a standard deviation of 3.792 and the mean and standard deviation after the intervention are 22.23 and 5.054 respectively. The t value is observed to be 2.818 and there is a significant difference at 0.01 level of significance. There is a significant difference in perceived stress between pretest(M = 24.37, SD = 3.792) and posttest (M = 22.23, SD = 5.05); $t(29) = 2.818, p < 0.01$.

It can be inferred that the tolerating uncertainty intervention has reduced the perceived stress level of the experimental group to a significant level. And this finding is supported from the theoretical background of intolerance of uncertainty which indicates that intolerance of uncertainty causes stress to the individual by the dissatisfaction of having not enough information about the future event and by thinking about the worst case scenario. Feeling unequipped and having negative beliefs can lead the individual to be stressed and helping the individuals deal with uncertainty better can lead to the lowered level of perceived stress. Therefore, the hypothesis, “*there will be no significant difference in the level of perceived stress*” is rejected.

SUMMARY

The objective of the current study was to examine the impact of psychological training that focuses on Uncertainty tolerance on variables like intolerance of uncertainty, worry and perceived stress and to understand the relationship between intolerance of uncertainty and worry, intolerance of uncertainty and perceived stress, worry and perceived stress among female adolescents. Correlational research design was used to determine the relationship between variables whereas one group pretest posttest experimental research design is adopted to study the impact of the intervention.

The data was collected through convenience sampling by distributing physical copies of Intolerance of uncertainty scale, penn state worry questionnaire and perceived stress scale to 120 female adolescents. Out of these 120, almost 90 individuals were having scores that fell on the higher end of the intolerance of uncertainty scale and out of these 30 were selected through convenience sampling. They constituted the experimental group to whom the intervention based on tolerating uncertainty was given.

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

The data collection happened in two phases, initial pre intervention data was collected a week before the intervention and the post intervention data was collected two weeks after the intervention. The intervention spanned over a week. The intervention primarily focused on increasing the tolerance of uncertainty among the experimental group. The intervention included educating the participants about uncertainty and its nature along with the drive to be certain. After the basic psycho-education, they were involved in activities that made them pick an incident where uncertainty was a huge hindrance and the thought, behaviour and emotions behind it was analysed. Even the in-between discussion activities were curated in a way that had uncertainty as a part of the instruction and nature of the activity. Relaxation techniques were taught and the participants were given experiential training on those somatic grounding techniques therefore, they would familiarise themselves with the process. Journaling was advised since it leads to introspection and gain better clarity on their thoughts and emotions, a basic template was given, therefore the adolescents can have an outlook on how to do journalling. Cognitive behavioural techniques were given special importance since there is ample amount of research which used this approach to manage anxiety and mood disorders, the conditions that are closely associated with IU.

Both the pre intervention and post intervention data were collected through physical copies and the test taking environment was supervised and appropriate. The relationship between variables were analysed through pearson product moment correlation and the difference between pre test and post test is calculated with paired sample t test. SPSS was used for analysis.

CONCLUSION

There is a significant positive relationship between Intolerance of uncertainty, worry and perceived stress among female adolescents. There is a significant difference in the levels of intolerance of uncertainty, worry and perceived stress between pre and post test among the experimental group

Implications

This study has found that a psychological intervention could possibly lower the level of intolerance of uncertainty among female adolescents. Therefore, intolerance of uncertainty as a variable is not a fixed or unchangeable construct rather it is understood that it can be manipulated. Females are prone to have anxiety disorders than males, intolerance of uncertainty and worry are few major components in those conditions, by using this psychological intervention one could develop tolerance towards uncertainty thereby reducing the levels of above mentioned variables which could create a ripple effect.

Results of this study have shown that uncertainty tolerance based psychological intervention has impacted intolerance of uncertainty, worry and perceived stress. This imply that components and activities in the intervention have helped the individuals and have created this significant difference.

Strengths of the study

- One of the first few studies to understand the relationship between these three variables together in one study
- Pilot intervention study that involves all these variables
- Pilot study that uses uncertainty tolerance intervention without one on one counselling

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

- Focuses on population who are prone to have high levels of IU due to cultural expectations
- Physical copies of tools were preferred over online forms to reduce biased responses
- Intervention was proven effective by the significant difference between pre and post test in all studied variables

Limitations of the study

- The sample size is small to generalise the results
- The intervention was given to adolescents in one school, there could be other factors working like the school culture, the socioeconomic environment etc
- There was no control group to help in better comparison
- Since it is a self report measure, there is a possibility of social desirability to set in
- This study is concerned with only females, therefore it cannot be generalised across genders
- This study focuses on only individuals who are literate and doesn't take others into consideration

Scope for future research

Intolerance of uncertainty is a concept that has been followed only since the last two decades and has gained importance and attention only after the pandemic. So there is a lot of work here to be contributed. First of all, intolerance of uncertainty is a variable that has not been sufficiently researched in the Indian context and from the findings of this study it was observable that a large proportion of adolescents were falling under the higher end. The areas future research can concrete on are:

- Can increase the sample size, and could bring in more cultural diversity.
- Can modify the intervention into a smaller module that has the same effectiveness but demands lesser time therefore, it can be easily incorporated into the school syllabus
- Can assess the gender difference in these variables and find out more evidences
- Can include other related psychological variables that could possibly play a mediating role and find the extent to which it affect the relationship within the variables
- Can extend this research with clinical populations who have disorders or conditions like GAD, OCD which have these variables are some central characteristics.

REFERENCES

- Andi Huang, LiLi Liu, Xiayong Wang, Jianbin Chen, Shunwei Liang, Xiaodan Peng, Jiahong Li, Cong Luo, Fang Fan, Jingbo Zhao, Intolerance of uncertainty and anxiety among college students during the re-emergence of COVID-19: Mediation effects of cognitive emotion regulation and moderation effects of family function, *Journal of Affective Disorders*, volume 327, 2023, Pages 378-384, ISSN 0165-0327, <https://doi.org/10.1016/j.jad.2023.01.110>.
- Angela H. Lee, Janet Woodruff-Borden, Roles of emotional reactivity, intolerance of uncertainty, and negative problem orientation on developing childhood worry, *Personality and Individual Differences*, Volume 135, 2018, pages 25-30, ISSN 0191-8869, <https://doi.org/10.1016/j.paid.2018.06.048>. (<https://www.sciencedirect.com/science/article/pii/S0191886918303805>)

**The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress
Among Female Adolescents**

- Angehrn, A., Krakauer, R.L. & Carleton, R.N. The Impact of Intolerance of Uncertainty and Anxiety Sensitivity on Mental Health Among Public Safety Personnel: When the Uncertain is Unavoidable. *Cogn Ther Res* 44, 919–930 (2020). <https://doi.org/10.1007/s10608-020-10107-2>
- Arkin, R. M., Oleson, K. C., & Carroll, P. J. (2013). *Handbook of the uncertain self*. Psychology Press
- Baik SH, Fox RS, Mills SD, Roesch SC, Sadler GR, Klonoff EA, Malcarne VL. Reliability and validity of the Perceived Stress Scale-10 in Hispanic Americans with English or Spanish language preference. *J Health Psychol*. 2019 Apr;24(5):628-639. doi: 10.1177/1359105316684938. Epub 2017 Jan 5. PMID: 28810432; PMCID: PMC6261792.
- Bakioğlu, F., Korkmaz, O. & Ercan, H. Fear of COVID-19 and Positivity: Mediating Role of Intolerance of Uncertainty, Depression, Anxiety, and Stress. *Int J Ment Health Addiction* 19, 2369–2382 (2021). <https://doi.org/10.1007/s11469-020-00331-y>
- Bibi, Humaira & Naz, Summaira & Afsar, Faria. (2022). Impact Of Mindfulness on Intolerance of Uncertainty and Affective Lability Among Individuals with Histrionic Personality Features. *Pakistan Journal of Social Research*. 04. 295-305. 10.52567/pjsr.v4i2.477.
- Bhandari, P. (2021, March 1). Mediator vs Moderator. Scribbr. Retrieved April 7, 2023, from <https://www.scribbr.com/methodology/mediator-vs-moderator/>
- Birrell, J., Meares, K., Wilkinson, A., & Freeston, M. (2011). Toward a definition of intolerance of uncertainty: A review of factor analytical studies of the intolerance of uncertainty scale. *Clinical Psychology Review*, 31(7), 1198-1208. doi: 10.1016/j.cpr.2011.07.009
- Boswell et al. (2013). Intolerance of uncertainty: A common factor in the treatment of emotional disorders. PubMed Central (PMC). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3712497/>
- Bottesi, G., Marchetti, I., Sica, C., & Ghisi, M. (2020). What is the internal structure of intolerance of uncertainty? A network analysis approach. *Journal of Anxiety Disorders*, 75, 102293. doi: 10.1016/j.janxdis.2020.102293
- Boelen, Paul A. PhD; Vrinssen, Inge MSc; van Tulder, Floor MSc. Intolerance of Uncertainty in Adolescents: Correlations with Worry, Social Anxiety, and Depression. *The Journal of Nervous and Mental Disease*: March 2010 - Volume 198 - Issue 3 - p 194-200 doi: 10.1097/NMD.0b013e3181d143de
- Bottesi, Gioia & Contin, Sara & Panzeri, Anna & Carraro, Eleonora & Bianconi, Sara & Ghisi, Marta. (2023). A Transdiagnostic Group Intervention Focusing on Intolerance of Uncertainty: Preliminary Evaluation of Effectiveness. *Psicoterapia Cognitiva e Comportamentale*. 29. 45-70. 10.14605/PCC2912302.
- Brown, T. A. (1997). The Nature of Generalized Anxiety Disorder and Pathological Worry: Current Evidence and Conceptual Models. *The Canadian Journal of Psychiatry*, 42(8), 817–825. doi:10.1177/070674379704200803
- Carleton, R. N., Collimore, K. C., & Asmundson, G. J. (2010). “It's not just the judgements—It's that I don't know”: Intolerance of uncertainty as a predictor of social anxiety. *Journal of Anxiety Disorders*, 24(2), 189-195. doi: 10.1016/j.janxdis.2009.10.007
- Carleton, R. N., Mulvogue, M. K., Thibodeau, M. A., McCabe, R. E., Antony, M. M., & Asmundson, G. J. (2012). Increasingly certain about uncertainty: Intolerance of uncertainty across anxiety and depression. *Journal of Anxiety Disorders*, 26(3), 468-479. doi: 10.1016/j.janxdis.2012.01.011

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behaviour*, 24, 385–396.
- Csikszentmihalyi, M. (2023, March 28). adolescence. *Encyclopedia Britannica*. <https://www.britannica.com/science/adolescence>
- David F. Tolin, Jonathan S. Abramowitz, Bartholomew D. Brigidi, Edna B. Foa, Intolerance of uncertainty in obsessive-compulsive disorder, *Journal of Anxiety Disorders*, Volume 17, Issue 2, 2003, Pages 233-242, ISSN 0887-6185, [https://doi.org/10.1016/S0887-6185\(02\)00182-2](https://doi.org/10.1016/S0887-6185(02)00182-2)
- Demirtas AS, Yildiz B. Hopelessness and perceived stress: the mediating role of cognitive flexibility and intolerance of uncertainty. *Dusunen Adam The Journal of Psychiatry and Neurological Sciences* 2019;32:259-267.
- Dugas, M.J., Hedayati, M., Karavidas, A. et al. Intolerance of Uncertainty and Information Processing: Evidence of Biased Recall and Interpretations. *Cogn Ther Res* 29, 57–70 (2005). <https://doi.org/10.1007/s10608-005-1648-9>
- Dugas, M.J., Gosselin, P. & Ladouceur, R. Intolerance of Uncertainty and Worry: Investigating Specificity in a Nonclinical Sample. *Cognitive Therapy and Research* 25, 551–558 (2001). <https://doi.org/10.1023/A:1005553414688>
- Eric Hazen, Steven Schlozman, Eugene Beresin; Adolescent Psychological Development: A Review. *Pediatr Rev* May 2008; 29 (5): 161–168. <https://doi.org/10.1542/pir.29-5-161>
- Engin Deniz, Self-compassion, intolerance of uncertainty, fear of COVID-19, and well-being: A serial mediation investigation, *Personality and Individual Differences*, Volume 177, 2021, 110824, ISSN 0191-8869, <https://doi.org/10.1016/j.paid.2021.110824>.
- Evelyn Behar, Ilyse Dobrow DiMarco, Eric B. Hekler, Jan Mohlman, Alison M. Staples, Current theoretical models of generalized anxiety disorder (GAD): Conceptual review and treatment implications, *Journal of Anxiety Disorders*, Volume 23, Issue 8, 2009, Pages 1011-1023, ISSN 0887-6185, <https://doi.org/10.1016/j.janxdis.2009.07.006>.
- Hebert, Elizabeth & Dugas, Michel. (2018). Behavioral Experiments for Intolerance of Uncertainty: Challenging the Unknown in the Treatment of Generalized Anxiety Disorder. *Cognitive and Behavioral Practice*. 26. 10.1016/j.cbpra.2018.07.007
- Jacoby, R. J. (2020). Intolerance of uncertainty. In J. S. Abramowitz & S. M. Blakey (Eds.), *Clinical handbook of fear and anxiety: Maintenance processes and treatment mechanisms* (pp. 45–63). American Psychological Association. <https://doi.org/10.1037/0000150-003>
- Jozef Bavolar, Pavol Kacmar, Monika Hricova, Jana Schrötter, Bibiana Kovacova-Holevova, Miroslava Köverova & Beata Raczova (2021) Intolerance of uncertainty and reactions to the COVID-19 pandemic, *The Journal of General Psychology*, DOI: 10.1080/00221309.2021.1922346
- Kendall, P.C., Norris, L.A., Rabner, J.C. et al. Intolerance of Uncertainty and Parental Accommodation: Promising Targets for Personalized Intervention for Youth Anxiety. *Curr Psychiatry Rep* 22, 49 (2020). <https://doi.org/10.1007/s11920-020-01170-3>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, coping and adaptation*. New York: Springer
- Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Penn State Worry Questionnaire (PSWQ) [Database record]. *APA PsycTests*. <https://doi.org/10.1037/t01760-000>

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

- Offer, D., & Schonert-Reichl, K.A. (1992). Debunking the myths of adolescence: findings from recent research. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31 6, 1003-14.
- Paul A. Boelen, Albert Reijntjes, Intolerance of uncertainty and social anxiety, *Journal of Anxiety Disorders*, Volume 23, Issue 1,2009, Pages 130-135, ISSN 0887-6185, <https://doi.org/10.1016/j.janxdis.2008.04.007>.(<https://www.sciencedirect.com/science/article/pii/S0887618508001114>)
- Phillips, A.C. (2013). Perceived Stress. In: Gellman, M.D., Turner, J.R. (eds) *Encyclopaedia of Behavioural Medicine*. Springer, New York, NY. https://doi.org/10.1007/978-1-4419-1005-9_479
- Purdon, C., & Harrington, J. (n.d.). Worry in Psychopathology. *Worry and Its Psychological Disorders*, 41–50. doi:10.1002/9780470713143.ch3
- Robert Ladouceur, Patrick Gosselin, Michel J Dugas. Experimental manipulation of intolerance of uncertainty: a study of a theoretical model of worry, *Behaviour Research and Therapy*, Volume 38, Issue 9, 2000, Pages 933-941, ISSN 0005-7967, [https://doi.org/10.1016/S0005-7967\(99\)00133-3](https://doi.org/10.1016/S0005-7967(99)00133-3).
- Rebecca Mallett, Clodagh Coyle, Yingtu Kuang, David T. Gillanders. Behind the masks: A cross-sectional study on intolerance of uncertainty, perceived vulnerability to disease and psychological flexibility in relation to state anxiety and wellbeing during the COVID-19 pandemic. *Journal of Contextual Behavioral Science*, Volume 22, 2021, Pages 52-62, ISSN 2212-1447, <https://doi.org/10.1016/j.jcbs.2021.09.003>.
- Ren, L., Wei, Z., Li, Y. et al. The relations between different components of intolerance of uncertainty and symptoms of generalized anxiety disorder: a network analysis. *BMC Psychiatry* 21, 448 (2021). <https://doi.org/10.1186/s12888-021-03455-0>
- Ryan J. Jacoby, Laura E. Fabricant, Rachel C. Leonard, Bradley C. Riemann, Jonathan S. Abramowitz, Just to be certain: Confirming the factor structure of the Intolerance of Uncertainty Scale in patients with obsessive-compulsive disorder, *Journal of Anxiety Disorders*, Volume 27, Issue 5,2013,Pages 35-542,ISSN 0887-6185,<https://doi.org/10.1016/j.janxdis.2013.07.008>.(<https://www.sciencedirect.com/science/article/pii/S0887618513001400>)
- Satici, B., Saricali, M., Satici, S.A. et al. Intolerance of Uncertainty and Mental Wellbeing: Serial Mediation by Rumination and Fear of COVID-19. *Int J Ment Health Addiction* 20, 2731–2742 (2022). <https://doi.org/10.1007/s11469-020-00305-0>
- Seyhan Çankaya & Tuğba İbrahimoğlu (2022) Stress, anxiety, intolerance of uncertainty, and psychological well-being characteristics of pregnant women with and without threatened miscarriage: a case-control study, *Journal of Obstetrics and Gynaecology*, DOI: 10.1080/01443615.2022.2158319
- Sibrava, N. J., & Borkovec, T. D. (n.d.). The Cognitive Avoidance Theory of Worry. *Worry and Its Psychological Disorders*, 239–256. doi:10.1002/9780470713143.ch14
- Sun, Chaoran & Li, Yumei & Kwok, Sylvia & Mu, Wenlong. (2022). The Relationship between Intolerance of Uncertainty and Problematic Social Media Use during the COVID-19 Pandemic: A Serial Mediation Model. *International Journal of Environmental Research and Public Health*. 19. 14924. 10.3390/ijerph192214924.
- Sternheim & A. Harrison | Peter Walla (Reviewing Editor) (2018) The acceptability, feasibility and possible benefits of a group-based intervention targeting intolerance of uncertainty in adolescent inpatients with anorexia nervosa, *Cogent Psychology*, 5:1, DOI: 10.1080/23311908.2018.1441594
- The three types of uncertainty in life. *Exploring your mind*. (2021, May 12). <https://exploringyourmind.com/the-three-types-of-uncertainty-in-life/>

The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents

- Tove Wahlund, Erik Andersson, Maral Jolstedt, Sean Perrin, Sarah Vigerland, Eva Serlachius, Intolerance of Uncertainty–Focused Treatment for Adolescents with Excessive Worry: A Pilot Feasibility Study, *Cognitive and Behavioural Practice*, Volume 27, Issue 2, 2020, Pages 215-230, ISSN 1077-7229, <https://doi.org/10.1016/j.cbpra.2019.06.002>. (<https://www.sciencedirect.com/science/article/pii/S1077722919300690>)
- University of Saskatchewan (n.d.). Understanding Worry. Saskatchewanstudents. Retrieved April 11, 2023, from <https://students.usask.ca/documents/counselling/understanding-worry.pdf>
- Woo, Jaeyeon & Hyun, Myoung-Ho. (2020). The Mediating Effect of Self-Compassion in the Relationship between Intolerance of Uncertainty and Worry. *Stress*. 28. 195-201. 10.17547/kjsr.2020.28.4.195.

Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Elumalai, K. & Shameem, M. (2024). The Effect of Psychological Intervention on Intolerance of Uncertainty, Worry and Perceived Stress Among Female Adolescents. *International Journal of Indian Psychology*, 12(2), 3618-3639. DIP:18.01.319.20241202, DOI:10.25215/1202.319