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Helping pediatric patients tolerate uncertainty during unprecedented times: Translating findings from new research on developmental psychopathology and two promising measures

Joshua Tiller-Ormord, Ciera Korte and Robert D Friedberg*

Center for the Study and Treatment of Anxious Youth at Palo Alto University, USA

Abstract

Objective: The COVID-19 pandemic continues to transform the lives of children and families across the United States. Rates of pediatric anxiety are expected to increase as ambiguity and uncertainty dominate lives. Practitioners working with pediatric populations must learn how to track and treat the virus's impact on their patients' mental health. The current review examines novel literature on pediatric mental health during the pandemic and evaluates two innovative measures that have been developed. These tools can give mental health and allied practitioners insight into the impact of children's tolerance of uncertainty on COVID-19 related worries and co-occurring psychopathology.

Method: This review prioritizes recent articles on the mental health effects of pandemics and how moderating factors such as intolerance of uncertainty (IU) impact anxiety and worry during unpredictable times. While data on the current pandemic and mental health continues to be collected, inferences are drawn based on similar events. Additionally, literature is evaluated to determine the potential usefulness of scales that measure intolerance of uncertainty in children and COVID-19 related worries.

Results: IU significantly impacts anxious symptoms and scales that measure it show promise. The Intolerance of Uncertainty Index-A for Children (IUI-A-C) is recommended as a mode of assessing children's general ability to tolerate ambiguous and uncertain situations. Additionally, the COVID-Related Thoughts and Behavioral Symptoms - Child Version (COV-TaBS-C) provides valuable insight into children's worries and behaviors related to the COVID-19 pandemic.

Conclusion: The IUI-A-C and COV-TaBS-C are potentially useful in measurement-based care. In particular, clinicians and researchers interested in evaluating children's vulnerabilities related to COVID-19, level of intolerance of uncertainty, crafting case conceptualizations, and delivering effective interventions should carefully consider these new instruments.

Introduction

The COVID-19 pandemic continues to bring drastic change to everyday life across the globe. The pandemic's impact is visible in the forms of social distancing, personal protective equipment, personal hygiene regimens, sensational news headlines, reduced in-person interactions, and ballooning online activity. Serafini *et al.* [1] identified pervasive anxiety, loneliness, frustration, and boredom as common psychological sequelae stemming from increased uncertainty, health risks, and isolation. While all ages are susceptible to the pandemic's deleterious impacts, vulnerable children are at heightened risk for developing uncontrollable worries [1]. Moreover, in a study on children's psychosocial responses to recent health pandemics (H1N1, SARS, and avian influenza), Sprang and Silman [2] observed post-traumatic stress-related symptoms in about one-third of isolated or quarantined youth. To address the pandemic's impact on psychosocial adjustment, behavioral health practitioners must be aware of relevant psychological vulnerabilities, likely triggers, resultant symptoms, and possible interventions to target COVID-related distress. This brief article aims to translate primary bench science findings regarding anxieties/worries in youth in the peri-pandemic period, intolerance of uncertainty, and the development of new assessment tools measuring COVID-19 related thoughts and behaviors to bedside clinical practices with pediatric patients.

Anxiety and worries in youth in the peri-pandemic period: Anxiety disorders are among the most common psychiatric conditions experienced by children and adolescents in the United States [3]. Furthermore, the prevalence of anxiety disorders is expected to increase during the COVID-19 pandemic [4]. Chronic fear related to the virus and concerns about loved ones' well-being might spur anxiety rates [4]. Individuals predisposed to excessive worries about their health are at higher risk for developing anxiety [5,6]. Additionally, parent-child conflicts may contribute to escalating prevalence rates [4,7]. Not surprisingly, preliminary studies from China already demonstrate

Correspondence to: Robert D. Friedberg, Ph.D., ABPP, Fellow, Clinical Child Psychology, American Psychological Association (Division 53), Fellow, Association for Behavioral and Cognitive Therapies, Head, Pediatric Behavioral Health Area, USA, E-mail: rfriedberg@paloaltou.edu

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increases in anxiety for both infected children and those safely sheltering at home [7].

The COVID-19 pandemic also increased the amount of daily uncertainty in people's lives [8]. With schools transitioning to an online format in most areas, reduction of pre-existing services and ever-changing mandates that vary by county, families face a great deal of uncertainty in addition to virus-related concerns. Adults with a lower capacity to tolerate uncertain situations show increased fear of COVID-19 [6]. Children with an inability to endure uncertain situations are expected to similarly display an increasingly higher risk of virus-related worry.

Intolerance of uncertainty: Intolerance of uncertainty (IU) is typically defined as an enduring trait reflecting the tendency to fear, avoid, or experience ambiguous events with extreme discomfort [9,10]. Excessive IU often results in maladaptive behaviors, cognitions, and emotional reactions [11,12]. As young children begin to recognize and react to uncertainty in their environments, IU becomes more apparent in pediatric patients [13,14]. Compared to adolescence, the association IU and worry is especially strong in younger children [15]. Further, Comer and colleagues [10] suggested that greater tolerance of uncertainty is a developmental achievement attained in adolescence but nonetheless may be impaired by significant anxiety.

Individuals with a low tolerance for uncertainty often experience extreme discomfort in ambiguous situations contributing to functional impairment when faced with uncertainty [10]. Frequently, uncertainty prompts fears of the worst outcomes happening (e.g., catastrophizing). Rifkin and Kendall [12] see the function of catastrophizing as an ill-fated attempt to reduce uncertainty. Consequently, patients are more prone to worry and adopting a negative problem orientation [16]. Clearly, IU presents a special challenge during unprecedented events such as the ongoing COVID-19 pandemic. Situations such as the current viral outbreak maintain elevated IU which in turn, drives swelling rates of anxiety disorders [9]. Heightened IU is implicated in general anxiety, social anxiety, separation anxiety, panic, specific phobia, depressive, somaticizing, and obsessive-compulsive disorders [11,17]. Given the link between IU and patterns of hypervigilance, catastrophizing, and avoidance [18], it is not surprising that IU is common among anxiety-related disorders. Therefore, assessing young patients' IU may help practitioners distinguish between subthreshold conditions and clinical disorders in pediatric patients [19].

Neville *et al.* [20] found that IU may exacerbate the intensity of pain in youth via catastrophizing and fear. Pediatric patients with greater IU show a tendency to perceive pain as more threatening and demonstrate greater avoidance behaviors [20,21]. This may lead to hypervigilance towards somatic sensations and reduced engagement in pleasurable activities feared to trigger pain [21].

Elevated IU appears to initiate, maintain, and exacerbate pediatric health anxiety. Clinicians caring for youth challenged by illnesses such as diabetes, asthma, gastrointestinal disease, or epilepsy must be particularly alert to their patients' level of IU [22,23]. Young people diagnosed with medical conditions face multiple uncertainties. If they find uncertainty unbearable, their worries and fears escalate [17,24]. Consequently, patients with high IU may be at increased risk of catastrophizing, fears of loss of control, and developing extreme hypervigilance towards symptoms.

Neuroimaging studies suggest that hyperactivity of the limbic areas may be implicated in patients with heightened IU [25] suggesting the possibility of a biological vulnerability. Limbic neural networks undergo significant development during late childhood and adolescence underscoring the importance of early detection and intervention [25]. Appropriate screeners allow for detection and early intervention when neural circuitry is more flexible and emotional-regulation pathways are not yet well developed [26].

Screening and measuring the impact of COVID-19 on pediatric patients: Due to the unprecedented nature of the current public health crisis in the United States, clinicians and researchers require new tools to understand the impact of COVID-19 on young people. Two novel measures developed this year demonstrate potential utility in tracking and evaluating IU as well as COVID-19 related worries in pediatric populations. These tools are potentially useful in screening for COVID-19 related emotional and behavioral sequelae, informing treatment plans, and tracking patient outcomes.

Intolerance of uncertainty index-A for children (IUI-A-C): This is a new measure adapted by Rifkin and Kendall [11] from the IUI-A for adults [27]. While the Intolerance of Uncertainty Scale for Children (IUSC) [10] previously existed as a way to evaluate IU in children, the IUSC was critiqued for assessing behavioral, emotional, and cognitive symptoms related to IU as opposed to being a generic measure of IU [11]. In contrast, the IUI-A-C was developed to focus more on general intolerance of uncertainty as a construct separate from anxiety-related symptoms [11]. Focusing on IU as a broad-brushed concept allows the IUI-A-C to function more as a transdiagnostic predictor of principal diagnosis severity. Using the IUI-A-C in this way enables clinicians to track pediatric patients' progress without relying on diagnosis-specific measures. Additionally, the scale was further refined by simplifying the language of the IUI-A to suit pediatric patients.

The self-report instrument evaluates young people's ability to endure uncertainty. Items on the survey include, "I can't stand that there are some things in life I won't know ahead of time" and "I can't stand being in a situation if I don't know what is going to happen." The measure contains 15 items in total, which are scored on a 5-point Likert Scale (1 (Not at all like me) 5 (Totally like me)). The scale was tested on 147 youth ages 7 to 17 years old and exhibited a high internal consistency with a Cronbach's alpha of 0.94 [11]. High internal consistency indicates the items in the scale generally tap into the same construct. The IUI-A-C demonstrated strong convergence with the Multidimensional Anxiety Scale for Children (MASC) [28], the Child Anxiety Impact scale-Child (CAIS-C) [29], and the intolerance of uncertainty clinician-rated index (IUCR) [11]. The strong convergent validities support the theoretical links between IU and anxiety. The IUI-A-C also displayed strong divergent validity with attention-deficit/hyperactivity disorder as measured by the anxiety disorder interview schedule for DSM-5: child and parent (ADIS-5-C/P) [11,30]. Thus, IUI-A-C is able to predict anxiety and seems unrelated to related ADHD which documents its discriminant utility. The combined solid convergent and divergent validity data builds a case for construct validity. In sum, the preliminary data documents the IUI-A-C's promising psychometric properties.

COVID-related thoughts and behavioral symptoms - child version (COV-TaBS-C): The COV-TaBS-C was created by Schneider and Storch [31] in a forward-thinking initiative to address the impact of the COVID-19 pandemic on pediatric populations. Not surprisingly, there was no measure available to address the viral outbreak's influence on children and adolescents. A narrow-band measure that assesses pediatric patients' cognitive, emotional, and behavioral response to COVID-19 offers clinicians and researchers several advantages. First, the narrow band instrument yields a fine-grained analysis of young

patients' reactions to a specific stressor. Consequently, the COV-TaBS-C helps clarify how much of the worry or anxiety experienced by children is directly related to virus-related concerns. Further, the instrument assesses a variety of thoughts, feelings, and behaviors. Finally, the items reflect many young people's prototypical responses to stressful events.

The COV-TaBS-C assesses the frequency of children's worries and behaviors related to COVID-19 over the previous two weeks using a five-point Likert-type scale (e.g., 1 Not at all 5 All of the time) spanning 10 items [31]. Pandemic-related feelings are evaluated with questions such as "I worried a lot about COVID-19" and "I could not stop thinking about really bad things that might happen because of COVID-19" [31]. The scale also contains items about sleep, handwashing, and other anxiety-related thoughts related to COVID-19. Since the instrument is brand new, no psychometric data is currently available. However, the COV-TaBS-C is the subject of ongoing multiple large-scale studies.

Clinical translations: Clinical practice in pediatric psychology is increasingly adopting measurement-based care (MBC) initiatives [32-35]. MBC is a clear way to translate evidence-based findings to direct patient care [36]. The practice involves initial pinpointing of core psychological/psychiatric vulnerabilities and recurrent auditing of treatment progress targeting these problems. MBC yields several salutary outcomes [32,34,35]. Bickman *et al.* [32] found that MBC was associated with faster rates of improvement. Ideally, real-time feedback to patients and clinicians is facilitated by proper MBC [37]. MBC was also related to better clinical judgment [38]. Not surprisingly, continuous quality improvement in clinical settings is facilitated by MBC [39].

The development of the COV-TaBS-C and IUI-A-C represent promising new generation clinical metrics useful for conceptualizing pediatric patients' behavioral health concerns and tracking psychosocial interventions during the peri-pandemic period. Robust conceptualizations often integrate both psychological trait and state variables. Traditionally, trait concepts are enduring, consistent patterns of behaviors whereas state variables are transient, temporary, and contextually present [40]. Traits often function as vulnerability factors (e.g., diatheses) that are activated by states. The COV-TaBS-C can be considered a state measure assessing young patients' and their parents' particular worries, cognitions, and behaviors related specifically to the COVID-19 pandemic. On the other hand, the IUI-A-C taps a more pervasive dispositional tendency to view uncertainty in general as threatening. Thus, by using the COV-TaBS-C and the IUI-A-C, clinicians may gain a potentially comprehensive picture of children and adolescents' functioning during the pandemic [41].

For instance, when crafting a clinical case conceptualization, young patients' level of IU would be considered a diathesis for multiple disorders especially those residing on the anxiety and OCD spectrum. Pediatric patients reporting high intolerance levels are more likely to be triggered by novel, ambiguous, unfamiliar, and unpredictable circumstances. If practitioners are alert to these dispositional vulnerabilities, they can plan interventions to mitigate their impact. Further, scores on the COV-TaBS-C would yield information on the current psychological implications of the pandemic. Clinicians could then survey the specific effects of these everyday contextual stressors on young people. In this way, the bench science findings can be translated into sound clinical practice.

Once pediatric patients' levels of IU are pinpointed, clinicians are ready to chart an intervention sequence. Modular Cognitive Behavioral Therapy (mCBT) shows promise in treating IU and its anxious sequelae [42,43]. Accordingly, teaching children and adolescents to practice relaxation when encountering ambiguous circumstances is a first step. Cognitive restructuring and problem-solving interventions could follow. Decatastrophizing procedures aimed at decreasing IU and COVID worries seem indicated. Typically, decatastrophizing interventions involve Socratic dialogues focused on helping separate probability from possibility, objectively evaluate the magnitude of dangers, and problem-solving [44,45]. For pre-adolescent patients, several structured exercises that are developmentally friendly and include appealing graphics are useful [45-47]. Problem-solving strategies are also effective in many cases. While many problem-solving protocols exist, they share common elements such as problem identification, brainstorming options, evaluating long/short term positive and negative consequences of each option, taking productive action, and self-reward [42,45,48].

The final but imperative module or phase of treatment is exposure/behavioral experiments. In this module, IU and COVID worries are faced head-on. Pediatric patients learn to approach uncertain circumstances they previously worked to escape. Accordingly, these procedures rely on the seminal bench science documenting state-dependent learning [49]. Exposures/behavioral experiments are fundamental experiential learning opportunities. In particular, "the experiential approach exposes the patient to experiences that are in themselves powerful enough to change misconceptions [50]". Finally, exposures/behavioral experiments must be debriefed so patients can extract personalized lessons based on individually drawn conclusions [51].

There are several engaging ways for clinicians to collaboratively construct exposures/experiments with pediatric patients struggling with heightened intolerance for uncertainty. For instance, patients can embrace uncertainty by reading and repeatedly reviewing newspaper articles focusing on the COVID-19 pandemic as well as events such as earthquakes, fires, hurricanes, etc. Further, routinely viewing television reports on these phenomena is another strategy.

Several games focusing on tolerating uncertainty could be played with pediatric patients. For example, *Pop-up Monkeys* [43] is recommended for young patients who fear unexpected events and ambiguity. In this exercise involving spring-loaded toy animals with different timing mechanisms, the toys are placed at different positions and the youths are invited to predict when they will pop-up. Unsurprisingly, they are often unable to succeed when the timing mechanism will "spring" into action and consequently must embrace uncertainty.

Finally, improv theatre games are also quite useful in tolerating uncertainty [43,45,52,53]. Improv theatre exercises are unscripted and focus on propelling spontaneity. Accordingly, these activities emphasize action and are quintessential here and now activities [54]. When applied in clinical settings, they increase tolerance for uncertainty and decrease anxiety [52,53,55].

Conclusion

The global effects of the COVID-19 pandemic shifted what is considered "normal" for many families. As circumstances become increasingly ambiguous and rates of anxiety in children increase, clinicians need to develop and utilize new tools to better serve their patients. The IUI-A-C and COV-TaBS-C are shining examples of new tools that can be used in both clinical research and clinical practice. These measures can be used to assess vulnerability to anxiety disorders related to intolerance of uncertainty, guide interventions, and track

treatment progress in children. Additionally, these new instruments can give clinicians and researchers valuable insight into the impact of the pandemic on patients' lives. With the utilization of such tools, practitioners and academicians can begin the difficult work of mitigating the effects of the pandemic in children.

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