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Published in:
Personality and Individual Differences

DOI:
10.1016/j.paid.2023.112476

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Publisher's Version
Publisher's PDF, also known as Version of record

Publication date:
2024

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):

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Transdiagnostic factors in depression and post-traumatic stress in a Mexican and Dutch sample

Alejandrina Hernández-Posadas, Anabel De la Rosa-Gómez, Theo K. Bouman, Juan Manuel Mancilla-Díaz, Adriana Del Palacio-González, Miriam J.J. Lommen

A Faculty of Behavioural and Social Sciences, University of Groningen, Netherlands
B Faculty of Higher Studies Iztacala, National Autonomous University of Mexico, Mexico
C Center for Alcohol and Drug Research, Aarhus University, Denmark

ARTICLE INFO

Keywords:
Intolerance of uncertainty
Emotional dysregulation
Rumination
Depression
Posttraumatic stress

ABSTRACT

Depression (DS) and post-traumatic stress symptoms (PTSS) exhibit a high prevalence and comorbidity. Previous studies suggest that various transdiagnostic cognitive and emotional factors, including intolerance of uncertainty, emotional dysregulation, and rumination, are predictors of these symptoms. However, research on transdiagnostic factors has mainly focused on Western countries, leaving limited knowledge about these factors in other regions, such as Latin America. The aim of this study was to evaluate a transdiagnostic model on the relationship between intolerance of uncertainty, emotional dysregulation, rumination, and DS and PTSS in a Latin American and Western European country, with social support and family cohesion examined as moderators. Data were collected from Mexico (n = 399) and The Netherlands (n = 358). A strong positive correlation was found between DS and PTSS in both samples. Emotional dysregulation and rumination acted as mediators in the relationship between intolerance of uncertainty and DS and PTSS, with consistent results in both countries. However, differences were observed in the moderation analysis between the samples. These findings highlight the importance of addressing transdiagnostic factors for a more comprehensive treatment of DS and PTSS. They also underscore the significance of considering cultural variables when examining the relationships between transdiagnostic factors and psychopathology.

1. Introduction

Depression and posttraumatic stress disorder are highly prevalent and comorbid disorders. This comorbidity persists even when accounting for overlapping symptoms (Elhai et al., 2008). Limited research has focused on the factors that may contribute to these disorders. Traditionally, vulnerability factors have been defined as symptom-specific, leading researchers to focus on their individual contributions to psychopathology (Hong & Cheung, 2015). However, emerging evidence suggests that many of these factors are transdiagnostic and contribute to the development and maintenance of multiple disorders. For depression symptoms (DS) and posttraumatic stress symptoms (PTSS), several transdiagnostic factors have been recognized, including: intolerance of uncertainty, emotional dysregulation, and rumination (Hernández-Posadas et al., 2023).

Intolerance of uncertainty, initially proposed as a specific factor for general anxiety disorder, has been recognized as a transdiagnostic factor associated with multiple disorders, including DS and PTSS (Del Valle et al., 2020; Ogleby et al., 2017). Intolerance of uncertainty refers to the dispositional inability of an individual to withstand the response triggered by the perceived absence of relevant, key or sufficient information (Carleton, 2016). Individuals with high levels of intolerance of uncertainty are more likely to perceive situations as uncertain and unpredictable, leading to increased feelings of worry and anxiety (Shihata et al., 2016).

Empirical studies have examined the relationship between intolerance of uncertainty and symptoms of DS and PTSS. Some studies suggest a direct relationship with DS (Barry et al., 2019), while others identify...
only an indirect relationship mediated via trait-anxiety (Swee et al., 2018) or negative affect (Toro et al., 2018). However, there is limited research investigating other mediators involved in the development and maintenance of PTSS.

Emotional dysregulation is characterized by difficulties in regulating and tolerating emotional distress, and is a factor of wide interest in transdiagnostic research. It has consistently been associated with DS and PTSD (Aldao et al., 2010). Research findings suggest that emotional dysregulation partially mediates the relationship between anxiety sensitivity (Ouimet et al., 2016), maladaptive beliefs about emotions (Ouimet et al., 2016), and attachment style (Pickard et al., 2016) and DS. Regarding PTSS, mediation analysis has determined that emotional regulation mediates negative affect and both PTSS and DS (Post et al., 2021).

Rumination, defined as repetitive and passive thoughts about negative emotions, their consequences, and causes (Nolen-Hoeksema et al., 2008), has consistently demonstrated a robust relationship with DS and PTSD (Olatunji et al., 2013; Szabo et al., 2017). Mediation analysis indicates that rumination mediates the relationships between perfectionism (De Rosa et al., 2021), autobiographical memory (Liu et al., 2017), and negative affect (Iqbal & Dar, 2015) and DS. Furthermore, the relationship between rumination and PTSS is mediated by hostility (Mathes et al., 2020), cognitive appraisal (Spinhoven et al., 2015), and deliberate rumination (García et al., 2018).

In sum, intolerance of uncertainty, emotional dysregulation, and rumination are transdiagnostic factors involved in both depression and PTSD and represent the mechanisms through which other factors contribute to the maintenance of these disorders. Given that depression and PTSD rank among the top 10 of most burdensome mental disorders (Ferrari, 2022) and co-occur in approximately 50% of the cases (Elhai et al., 2008), it is essential to better understand how these well-established transdiagnostic factors are related.

Another important aspect that has been overlooked in most research is the generalizability of findings. Most of the research on these transdiagnostic factors has been conducted in North American and European countries, leaving many regions including Latin America underrepresented. Evidence suggests that psychopathology may be influenced by the cultural context found in different countries (Moleiro, 2018), emphasizing the importance of studying these transdiagnostic factors in different cultural contexts to test the applicability of findings to culturally diverse populations.

Two key factors associated with DS and PTSD that often vary across countries are social support and family cohesion. Social support has been recognized as a significant protective factor that positively influences individuals’ coping abilities for managing DS and PTSD (Brewin et al., 2000) and might vary between collectivistic and individualistic cultural groups. Individuals with a more collectivistic orientation, such as those in Latin America, tend to perceive greater support compared to those from individualistic cultures, like North Americans. Consequently, individuals from collectivistic cultures are more likely to benefit from a supportive network (Shavitt et al., 2016). Also family cohesion has been found to influence DS and PTSD (Sarmiento & Cardemil, 2009), and may vary across countries. Strong family cohesion is present in many Asian and Latin American countries, whereas Scandinavian countries and many Western European countries tend to have weaker family cohesion levels (Mair, 2013). The influence of social support and family cohesion thus seem relevant to include when studying mental health outcomes in samples from different countries.

The aim of this study is to evaluate a transdiagnostic model that explores the relationship between intolerance of uncertainty, emotional dysregulation, rumination, and DS and PTSS in a Latin American country (Mexico) and Western European country (Netherlands). We hypothesized that intolerance of uncertainty, emotional dysregulation, rumination predict DS and PTSS (Hypothesis 1). The association between intolerance of uncertainty and DS and PTSS is partially accounted for by emotional dysregulation and rumination (Hypothesis 2). Social support and family cohesion moderate the relationship between the transdiagnostic factors and DS and PTSS (Hypothesis 3). We expect similar findings across countries, but a stronger moderating effect of social support and family cohesion in the Mexican sample (Hypothesis 4).

2. Method

2.1. Participants

Data were obtained from convenience samples in two different countries: Mexico (n = 399) and the Netherlands (n = 358). Participants in the Mexican sample ranged in age from 18 to 70 years, while those from the Dutch sample ranged from 18 to 71 years of age. Table 1 summarizes the demographic information of both samples.

2.2. Ethical considerations

The study was approved by the Ethics Committee at the Faculty of Higher Studies Iztacala, National Autonomous University of Mexico (CE/FESI/042022/1495) and the Faculty of Behavioural and Social Sciences, University of Groningen (PSY-2122-S-0419).

2.3. Measures

Due to the unavailability of identical validated versions in both languages (Spanish and Dutch) for certain questionnaires (intolerance of uncertainty, emotional dysregulation, and rumination), priority was given to utilizing the available validated versions. As a result, there may be variations in the number of items and responses of some questionnaires between the samples.

Intolerance of uncertainty scale IUS-12 (Mexican version: Hernández-Posadas et al., 2023; Dutch version: Helsen et al., 2013) is a 12-item self-report measure that assesses individuals’ ability to tolerate uncertainty about ambiguous future events. Items were rated on a Likert scale, with higher scores indicative of greater intolerance of uncertainty. Cronbach’s alpha in the current study was 0.91 for the Mexican sample and 0.86 for the Dutch sample.

Difficulties in Emotion Regulation Scale DERS (Mexican version: De la Rosa et al., 2021; Dutch version: Neumann et al., 2010) is a self-report measure that assesses individuals’ typical levels of emotion dysregulation. Items were rated on a 5-point Likert scale, with higher scores indicative of greater emotion dysregulation. For the Mexican sample, the 15-item version was used, whereas the 32-item version was used in

<table>
<thead>
<tr>
<th>Table 1 Demographic information.</th>
<th>Mexican (n = 399)</th>
<th>Dutch (n = 358)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, M (SD)</td>
<td>36.99 (11.48)</td>
<td>28.37 (13.73)</td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>322 (80.7)</td>
<td>287 (80.2)</td>
</tr>
<tr>
<td>Men</td>
<td>74 (18.5)</td>
<td>67 (18.7)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (0.8)</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>Marital status, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>217 (54.4)</td>
<td>267 (74.6)</td>
</tr>
<tr>
<td>Married or cohabiting</td>
<td>128 (32.1)</td>
<td>72 (20)</td>
</tr>
<tr>
<td>Other</td>
<td>54 (13.5)</td>
<td>19 (5.4)</td>
</tr>
<tr>
<td>Education level, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>50 (12.5)</td>
<td>297 (82.7)</td>
</tr>
<tr>
<td>University</td>
<td>349 (87.5)</td>
<td>62 (17.3)</td>
</tr>
<tr>
<td>Occupation, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>96 (24.1)</td>
<td>210 (58.7)</td>
</tr>
<tr>
<td>Paid employment</td>
<td>239 (59.9)</td>
<td>105 (29.4)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>43 (10.8)</td>
<td>12 (3.4)</td>
</tr>
<tr>
<td>Other</td>
<td>21 (5.2)</td>
<td>31 (8.5)</td>
</tr>
<tr>
<td>Religion, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>247 (61.2)</td>
<td>72 (20.3)</td>
</tr>
<tr>
<td>No</td>
<td>152 (38.1)</td>
<td>286 (79.7)</td>
</tr>
</tbody>
</table>
3. Results

Both samples exhibited positive correlations among all transdiagnostic factors and with DS and PTSS (Tables 2 and 3). Furthermore, social support and family cohesion correlated negatively with all transdiagnostic factors and with DS and PTSS in both samples. DS and PTSS scores were significantly higher in the Mexican sample compared to the Dutch sample (Table 4).

The hypothesized model included DS and PTSS as dependent variables, and emotional dysregulation and rumination as mediators between intolerance of uncertainty and the dependent variables. Covariates were included between DS and PTSS, as well as emotional dysregulation and rumination, due to their theoretical overlap and strong correlations. To assess the influence of sociodemographic variables (sex, age, marital status, education, occupation, religion) on DS and PTSS, a model incorporating them was analyzed. However, the results indicated that none of these variables showed statistical significance (p ≥ .05). The model was independently tested in the Mexican and the Dutch sample using SEM. Goodness-of-fit indices indicated an acceptable model fit for the Mexican sample (χ2/df = 8.864, CFI = 0.995; NFI = 0.993; RMSEA = 0.093, SRMR = 0.027) as well as for the Dutch sample (χ2/df = 2.198, CFI = 0.99; NFI = 0.998; RMSEA = 0.017, SRMR = 0.01).

Standardized parameter estimates for the transdiagnostic model are shown in Fig. 1 (Mexican sample) and Fig. 2 (Dutch sample). The factor loadings exhibited a consistent pattern across samples. Results indicated significant direct effects within the model. Specifically, the direct path from intolerance of uncertainty to emotional dysregulation and rumination was found to be statistically significant, indicating a direct association between these variables. Similarly, the direct paths from emotional dysregulation and rumination to DS and PTSS were statistically significant, thus supporting Hypothesis 1. In the Mexican sample, these variables accounted for 65 % of DS's variance and 57 % of PTSS's variance. In the Dutch sample, they accounted for 58 % of DS's variance and 40 % of PTSS's variance.

Consistent with Hypothesis 2, emotional dysregulation and rumination partially accounted the relationship between intolerance of uncertainty and DS. The total indirect effect in the Mexican sample of intolerance of uncertainty on DS through emotional dysregulation and rumination was statistically significant a1*b1 + a2*b2 = 0.526, p < .001, with a 95 % bootstrap confidence interval (CI) of 0.465 to 0.581. Similarly, the indirect effect of intolerance of uncertainty on PTSS through emotional dysregulation and rumination was statistically significant a1*m1 + a2*m2 = 0.494, p < .001, 95 % CI of 0.437 to 0.552.

Similarly, in the Dutch sample, both emotional dysregulation and rumination partially accounted the relationship between intolerance of uncertainty and DS and PTSS. The total indirect effect of intolerance of uncertainty on DS through emotional dysregulation and rumination was statistically significant a1*b1 + a2*b2 = 0.448, p < .001, 95 % CI of 0.385 to 0.511. Similarly, the indirect effect of intolerance of uncertainty on PTSS through emotional dysregulation and rumination was statistically significant a1*m1 + a2*m2 = 0.374, p < .001, 95 % CI of 0.314 to 0.439.

Contrary to hypothesis 4, significant differences in social support and family cohesion were observed between the samples, with higher mean scores in the Dutch sample. Additionally, we explored social support and family cohesion as moderators between emotional dysregulation and rumination and DS and PTSS within each sample. Significant moderating effects will be presented, and complete moderation analyses will be available in the supplementary material. In the Mexican sample, family cohesion moderated the relationship between rumination and
4. Discussion

The results of this study revealed a strong positive correlation between DS and PTSS in both Mexican and Dutch samples, aligning with prior evidence supporting significant symptom overlap between these symptomatology’s (Elhai et al., 2008). Additionally, our results demonstrated significant direct positive effects of intolerance of uncertainty on emotional dysregulation and rumination, as well as from emotional dysregulation and rumination to DS and PTSS. These findings align with recent research indicating a direct influence of emotional dysregulation and rumination on DS and PTSS (Hernández-Posadas et al., 2023). Furthermore, the results indicated that these trans-diagnostic factors collectively explain a significant portion of the variability observed in DS and PTSS.

The indirect effects suggest that in both samples intolerance of uncertainty may lead to emotional dysregulation and rumination, which in turn, are associated with an increased risk of DS and PTSS. Individuals
with high levels of intolerance of uncertainty experience heightened difficulties regulating their emotions and are prone to engage in rumination as a way to deal with negative emotions. This tendency, in turn, increases their susceptibility to developing DS and PTSS. These findings support the conceptual framework suggesting that rumination acts as a mediator that links cognitive vulnerabilities to negative psychological outcomes (Spasojevic & Alloy, 2001), and build upon existing evidence that emotional dysregulation is an important factor in psychopathological comorbidity (Aldao, 2012).

Furthermore, the moderator analysis revealed differences between the Mexican and Dutch samples. In the Mexican sample, family cohesion moderated the relationship between rumination and both DS and PTSS, whereas social support did not moderate any of the relationships. On the other hand, in the Dutch sample, both social support and family cohesion moderated these relationships.

The finding that only family cohesion, not social support, moderated the relationship between the transdiagnostic factors and DS and PTSS in the Mexican sample was unexpected. Given that in collectivistic cultures, where family and community ties are highly valued, social support and family cohesion have a more significant impact on mental health outcomes than in individualistic cultures (Mair, 2013). A plausible explanation might be the sample characteristics: the Mexican sample had a higher average age, which align with prior research indicating age-related variations in social support, with middle-aged adults relying more on blood relatives and children as their main sources of social support (Heinze et al., 2015). Our Dutch sample consisted of much younger university students who, at that age, might maintain strong connections with their nuclear family and peers. Consequently, both social support and family cohesion were higher in the Dutch sample. Furthermore, despite noticeable differences in education and religion between the samples, these variables did not emerge as significant predictors beyond the transdiagnostic factors for DS and PTSS.

The findings of the current study have some limitations that should be acknowledged when interpreting the results. First, although all measures used were culturally adapted, validated, and demonstrated good psychometric properties, variations in the number of items posed a challenge in estimating invariance between the samples. Second, the cross-sectional design limits causal relationship conclusions when using mediation analyses. Future studies should consider longitudinal designs to test hypothesized causal relationships. Third, the study had sample characteristics that may affect the generalizability of the results, including a majority of the female participants. In addition, the study...
Table 6
Significant moderating effects on the Dutch sample.

<table>
<thead>
<tr>
<th>Outcome variable depression symptoms</th>
<th>b</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>95 % CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional dysregulation</td>
<td>0.299</td>
<td>0.017</td>
<td>17.003</td>
<td>&lt;0.001</td>
<td>0.264 - 0.334</td>
</tr>
<tr>
<td>Social support</td>
<td>-0.362</td>
<td>0.046</td>
<td>-7.837</td>
<td>&lt;0.001</td>
<td>-0.453 - -0.271</td>
</tr>
<tr>
<td>Emotional dysregulation* Social support</td>
<td>-0.004</td>
<td>0.002</td>
<td>-2.474</td>
<td>0.013</td>
<td>-0.008 - -0.001</td>
</tr>
<tr>
<td>Emotional dysregulation</td>
<td>0.305</td>
<td>0.018</td>
<td>16.474</td>
<td>&lt;0.001</td>
<td>0.268 - 0.341</td>
</tr>
<tr>
<td>Family cohesion</td>
<td>-0.341</td>
<td>0.062</td>
<td>-5.472</td>
<td>&lt;0.001</td>
<td>-0.464 - -0.219</td>
</tr>
<tr>
<td>Emotional dysregulation* Family cohesion</td>
<td>-0.008</td>
<td>0.002</td>
<td>-2.795</td>
<td>0.005</td>
<td>-0.013 - -0.002</td>
</tr>
<tr>
<td>Rumination</td>
<td>0.456</td>
<td>0.026</td>
<td>17.437</td>
<td>&lt;0.001</td>
<td>0.404 - 0.507</td>
</tr>
<tr>
<td>Social support</td>
<td>-0.406</td>
<td>0.045</td>
<td>-8.872</td>
<td>&lt;0.001</td>
<td>-0.496 - -0.316</td>
</tr>
<tr>
<td>Rumination*Social support</td>
<td>-0.016</td>
<td>0.003</td>
<td>-4.804</td>
<td>&lt;0.001</td>
<td>-0.022 - -0.009</td>
</tr>
<tr>
<td>Rumination</td>
<td>0.456</td>
<td>0.029</td>
<td>15.711</td>
<td>&lt;0.001</td>
<td>0.399 - 0.513</td>
</tr>
<tr>
<td>Family cohesion</td>
<td>-0.342</td>
<td>0.065</td>
<td>-5.206</td>
<td>&lt;0.001</td>
<td>-0.471 - -0.213</td>
</tr>
<tr>
<td>Rumination*Family cohesion</td>
<td>-0.017</td>
<td>0.004</td>
<td>-3.587</td>
<td>&lt;0.001</td>
<td>-0.027 - -0.007</td>
</tr>
</tbody>
</table>

Outcome variable posttraumatic stress symptoms

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>95 % CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rumination</td>
<td>0.592</td>
<td>0.049</td>
<td>12.004</td>
<td>&lt;0.001</td>
<td>0.495 - 0.690</td>
</tr>
<tr>
<td>Family cohesion</td>
<td>-0.631</td>
<td>0.111</td>
<td>-5.641</td>
<td>&lt;0.001</td>
<td>-0.850 - -0.411</td>
</tr>
<tr>
<td>Rumination* Family cohesion</td>
<td>-0.016</td>
<td>0.008</td>
<td>-2.005</td>
<td>0.045</td>
<td>-0.033 - -0.0003</td>
</tr>
</tbody>
</table>

Fig. 4. Moderating effects on the Dutch sample.
included only non-clinical participants, resulting in a limited range of scores on the DS and PTSD questionnaire. Future research should aim for more comparable samples and explore these factors in clinical samples.

In conclusion and notwithstanding the above limitations, the findings of this study underscore the importance of recognizing the commonalities between DS and PTSD, suggesting shared underlying mechanisms. Clinicians can benefit from assessing these transdiagnostic factors when diagnosing and treating these conditions. Identifying mediators provide insight into the underlying mechanisms of the relationship between transdiagnostic factors and DS and PTSD, facilitating the development of more effective and targeted interventions. By addressing these factors, clinicians may comprehensively and efficiently address both DS and PTSD. Finally, these findings highlight the importance of assessing cultural related factors, such as social support and family cohesion, as they influence individuals’ coping abilities for managing DS and PTSD. Overall, the study's findings contribute to a growing body of literature that emphasizes the importance of taking a transdiagnostic approach to understanding mental health disorders.

CRediT authorship contribution statement


Declaración de intereses

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgments

To the Consejo Nacional de Humanidades, Ciencias y Tecnologías (CONAHCYT). Doctoral scholarship number 751969 (scholar number CVU: 697623). National Autonomous University of Mexico (UNAM). Master's and Doctorate Program in Psychology UNAM. University of Groningen.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2023.112476.

References


