Emotion Regulation Mediates the Association between Spirituality and Distress Tolerance in Students: A Cross-Sectional Study

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Abstract

This cross-sectional study investigated the underlying mechanism of the relationship between trait spirituality and distress tolerance in a sample of university students (76.9%) and normal citizens (23.1%) (*N* = 186). Emotion regulation, specifically cognitive reappraisal, was examined as a mediator of this relationship. The study hypothesized that spirituality would be directly associated with distress tolerance and indirectly associated through cognitive reappraisal. The rationale for the hypotheses in this study was drawn from previous research demonstrating a positive correlation between spirituality and distress tolerance, as well as indications that this relationship may be mediated by the use of adaptive emotion regulation strategies in high-stress environments. Participants completed online self-report measures of spirituality, emotion regulation, and distress tolerance. Regression analyses indicated that trait spirituality was not directly associated with distress tolerance but was associated with greater use of cognitive reappraisal. In turn, greater use of cognitive reappraisal was associated with higher distress tolerance. The indirect effect of spirituality on distress tolerance through cognitive reappraisal was statistically significant but small. Findings suggest that cognitive reappraisal plays an important role in the relationship between spirituality and distress tolerance. Furthermore, this research aims to contribute to the management of unpleasant emotions by promoting the regulation of students' emotions through spiritual practices in academic contexts.

Keywords: distress tolerance, spirituality, cognitive reappraisal, emotion regulation, students

The capacity to tolerate uncomfortable emotional states varies from person to person. Examination of psychopathological data from the past century revealed that people's tolerance for uncomfortable emotions determined the development and maintenance of mental health (Leyro et al., 2010). In times in which digitalization is shaping the world outside of us with more stimulation than ever before, the regulation of the world inside of us is gaining even more relevance to an increasing number of individuals. This holds particularly true for populations pressured by a realm of mental health threatening stressors, such as university students (Frazier et al., 2019). Based on ancient healing principles, a growing body of psychopathological research emphasizes the relationship between spirituality and people's tolerance for distressing emotions. Neuropsychological research reasons the relationship between spirituality and the perception of emotions due to its positive effect on biochemistry and physiology (Mahmoodi et al. 2017; Akbari & Hossaini, 2018). Clinical psychology dedicates increasing attention to discovering the positive association between spirituality and emotion regulation. According to previous studies, higher tolerance for distress was attributed to the use of adaptive emotion regulation strategies. As far as we know, the links between the conceptions of spirituality, emotion regulation, and distress tolerance have not yet come under joint empirical investigation. Overall, the purpose of this study is to investigate the mediating role of emotion regulation strategies in the association between students' trait spirituality and tolerance for adverse emotional experiences. The results of this study intend to fill the gap in the understanding of the relationship between spirituality and distress tolerance.

Spirituality

Galea (2014) discovered that, next to the relevant roles which personality and environmental factors play, peoples' spirituality predicted their overall well-being. The definition of spirituality has been debated throughout the history of scientific research on it. A meta-study by Zinnbauer et al. (1999) compared different conceptualizations of the construct and concluded that more differences were found than similarities. Psychologist Brach differentiates between vertical and horizontal spirituality (Bohlmeijer & Hulsbergen, 2018). On the one hand, vertical spirituality denotes

connecting to a 'higher' entity or reaching a peak experience, such as an enlightening spiritual experience. Horizontal spirituality, on the other hand, refers to connecting with the present moment, being awake in everyday life and finding inspiration and connection in relationships (Bohlmeijer & Hulsbergen, 2018). Amedeo (2018) contrasts Brach's dualistic concept of spirituality by insisting that the spiritual potential is neither to enter a unique state of consciousness detached from everyday life nor to seek peace and comfort in meditation alone. Instead, it consists of learning to live with greater openness, presence, and joy, which fosters a more intimate relationship with life. However, the goal is just like in meditation and mindfulness practices, to accept whatever we are experiencing, whether it is pleasant or unpleasant (Amedeo, 2018). This paper combines these concepts and construes spirituality as "the experience of connectedness with oneself, connectedness with others and nature, and connectedness with the transcendent" (de Jager Meezenbroek et al., 2012, p.338). Since spirituality is a universal human experience, it can be held by anybody, regardless of religion or other affiliations (de Jager Meezenbroek et al., 2012). Spirituality, as defined in this paper, is rooted in research indicating that spiritual beliefs can positively impact mental health independent of spiritual practices (Crossley & Salter, 2005). It is characterized as a self-reported perspective encompassing attitudes such as respect and compassion towards life (Haug, 1998).

Spirituality can assist university students in managing stress and emotional experiences by promoting a connection with oneself, others, and the transcendent, as noted by Haug (1998). Villani et al. (2019) found that trait spirituality can enhance self-worth and inner satisfaction. Additionally, research has shown that spirituality increased self-esteem and provided a sense of purpose and meaning, helping students find perspective in difficult situations (Sequeira et al., 2012; Kerr et al., 2015; Chan & Mak, 2018) by connecting with a higher power (Mohammdipour et al., 2021). McClintock et al. (2019) suggest that spirituality affects neural mechanisms related to stress processing, making it a valuable resilience factor. Studies also indicated that higher spiritual beliefs were associated with a more consistent use of positive coping strategies, which can reduce psychological and emotional distress (Tull et al., 2015; Kerr et al., 2015). According to the Dalai Lama,

spirituality can act as a moral compass to curb the destructive emotions that often accompany materialism in modern society (Popova, 2018). Students, who commonly experience high levels of stress due to academic demands and other pressures, may benefit from trait spirituality as it consistently indicated positive impacts on managing emotions and alleviating challenging sensations.

Emotional Distress Tolerance

One's perceived ability to tolerate negative emotional states, such as anger or sadness, and maintain task and goal-directed behaviour is termed emotional distress tolerance. People vary in the degree to which they perceive emotional states as subjectively aversive or personally threatening and their habitual response to such internal experiences (Zvolensky, et al., 2011; Conway et al., 2020). A higher ability to tolerate emotions perceived as uncomfortable co-occurs with individuals' persistence in daily routines and valued social roles. A lower ability to accept negative internal states is concomitant with individuals' tendency to withdraw from daily routines and long-term goals in favour of short-term emotional relief, often in the form of dysfunctional or unsustainable behavioural responses such as substance use, social isolation, or excessive consumption (Conway et al., 2020). Psychopathological studies emphasize that low tolerance for unpleasant emotions is a crucial mechanism underlying a wide spectrum of mental disorders, in particular substance use disorders (Simons & Gaher, 2005; Zvolensky et al., 2011), as well as students' potential for suicidality (Conway et al., 2020). Opposingly, clinical studies in students found higher distress tolerance to be associated with fewer substance dependencies (Aziz et al., 2010; Kaiser et al., 2012, O'Hara et al., 2016) and fewer depressive symptoms (Dennhardt & Murphy, 2011; Zhang et al., 2021). In research contexts, low distress tolerance has been attributed to emotional dysregulation and emotional suppression (Zvolensky et al., 2011, Jeffries et al., 2016). On the other hand, higher distress tolerance has been traced back to more adaptive emotion regulation (Jowkar & Kamali, 2016). Similarly, recent research also highlights the importance of other factors that influence people's tolerance of emotional distress. Among others, spirituality might play a role in explaining differences in tolerance to emotional distress (McIntosh, 2021; Mohammadipour, 2021). Overall, students' well-being was

discovered to be influenced by their ability to tolerate the occurrence of arousing emotions without resorting to compensatory behaviours. The level of distress tolerance is not only influenced by students' trait spirituality, but also by the strategies they use to manage their emotions, as described below.

Emotion Regulation

The use of different emotion regulation (ER) strategies can lead to differences in students' ability to cope with emotional distress (Azizi, et al., 2010; Preece et al., 2019). The ability to regulate one's emotions is conceptualized as a set of strategies used to increase, maintain, or decrease certain emotions (Jermann, et al., 2006). Current clinical theories distinguish between adaptive emotion regulation strategies, such as acceptance, and maladaptive emotion regulation strategies, such as avoidance (Jeffries et al., 2016). Notably, using maladaptive emotion regulation strategies poses a risk factor for developing psychopathological illnesses whilst the use of adaptive emotion regulation strategies demonstrates protection for well-being (Gross et al., 2006; Aldao et al., 2014).

Congruent with previous studies on distress tolerance, this paper examines the maladaptive strategy of expressive suppression and the adaptive strategy of cognitive reappraisal (Preece et al., 2019). Expressive suppression is defined as purposively inhibiting ongoing emotional sensations (Zvolensky, et al., 2011). This strategy relates to feeling and expressing less positive emotion while experiencing more negative emotion (John & John, 2003). The disconnection with one's own emotions not only disrupts social communication but also raises perceived stress levels consequently (Butler et al., 2013). Student samples revealed that emotion suppression had a predictive effect on psychological distress (Haga et al., 2009; Jeffries et al., 2016; Richmond et al., 2017). Opposingly, cognitive reappraisal translates to changing the meaning of emotionally evocative stimuli by cognitively appraising them (Ochsner & Gross, 2005). In contrast to suppression, appraisal correlates with experiencing and expressing more positive emotion and less negative emotion (John & John, 2003). In other words, choosing to cognitively reappraise negative emotions such as shame or anger hold the power to positively alter those emotional states (Butler et al., 2003). This goes in line with William

James' conviction that "The greatest weapon against stress is our ability to choose one thought over another" (Finley, 2017, para. 1).

A growing body of research supports the mediating role of emotion regulation in the relation between spirituality and emotional well-being (Urry & Poey, 2008; Putri et al., 2020). Furthermore, spirituality has been shown to increase tolerance of negative experiences in individuals from socioeconomic groups who are continuously exposed to steadily increasing distress. Mohammadipour et al. (2021) report higher distress tolerance in students who held spiritual beliefs. Also, emotion regulation has mediated the effect of spirituality and the prevention of burnout (Akbari & Hossaini, 2018). In conclusion, spirituality, and emotion regulation work together to reduce stress in high-stress environments like universities (Putri et al., 2020), paving one way for building distress tolerance.

This study

As the tolerance for emotional distress varie between individuals and predicts their general mental health, underlying factors explaining those differences are of interest. The ability to solve, reduce or tolerate emotional adversities and daily stressors was higher among university students who held spiritual beliefs (Mohammadipour et al., 2021). This roots in the positive outlook spirituality can convey towards adverse experiences (Gnanaprakash, 2013). Moreover, Jowkar and Kamali (2016) explored the relationship between spirituality and cognitive emotion regulation among university students and concluded that spirituality predicts the use of adaptive regulation strategies. Akbari & Hossaini (2018) emphasized the mediating role of emotion regulation in the relation between spirituality and the quality of life as well as general mental health.

Although the relationships between spirituality and distress tolerance, spirituality and emotion regulation, and emotion regulation and distress tolerance have been studied separately, the three constructs have not yet been studied together. In short, the underlying mechanism responsible for the link between spirituality and higher distress tolerance is still unknown. This study thus targets the research gap between students' trait spirituality and the extent to which they tolerate emotional distress. The leading question of this paper is hence 'Is spirituality associated with a higher distress

tolerance in university students as mediated through emotion regulation?'. Given that finding meaning and purpose is crucial in both trait spirituality and cognitive reappraisal, it is hypothesised that individuals who report the use of such have a higher emotional distress tolerance.

The following four hypotheses have been formulated:

Hypothesis 1: Trait spirituality is directly associated with higher distress tolerance.

Hypothesis 2: Trait spirituality is associated with the use of a more adaptive emotion regulation strategy.

Hypothesis 3: The use of a more adaptive regulation strategy is associated with higher distress tolerance.

Hypothesis 4: Trait spirituality is indirectly associated with higher distress tolerance through emotion regulation.

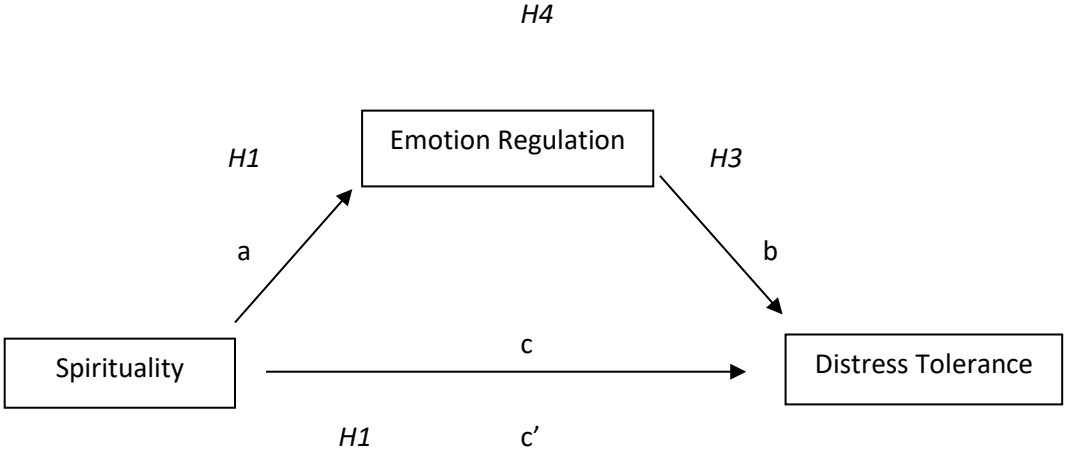
Method

Design

The study employed a cross-sectional design with the independent variable *spirituality*, the dependent variable *emotional distress tolerance*, and the mediating variable *emotion regulation* (see Figure 1).

Figure 1

Hypothesized Mediation Model



Note. c' = direct effect of X on Y; c = indirect effect of X on Y through M or a*b.

Participants

A total of 238 participants (*N* = 238) volunteered their time for the study. Due to missing values, withdrawal of the initial consent or the consent after the debriefing, 52 participants in the sample were excluded from the analysis, leaving a total of 186 valid cases (*N* = 186). The highest proportion of respondents (76.3%) was between the ages of 18 and 24, followed by 15.6% of those between the ages of 25 and 34, 1.1% between the ages of 35 and 44, 2.2% between the ages of 45 and 54, 4.3% between the ages of 44 and 64, and 0.5% who ranged between the ages of 65 and 74. 122 respondents (65.6%) in the sample identified as female, 60 respondents (32.3%) as male, and 4 respondents (2.2%) as non-binary. While 71.0% of respondents were from Germany and 15.1% were from the Netherlands, 14.0% indicated another country of origin. With 76.9%, most of the respondents were students, 12.4% were employed full-time, 6.5% were employed part-time, 1.6% were unemployed, another 1.6% were self-employed and 1.1% were retired.

Even though the target group consisted of students, non-students were also sampled to determine whether the results of the study apply to the general population or are specific to the student population. By determining whether the results can be extrapolated beyond the original student sample, this method was intended to increase the external validity of the study (Shepperd et al., 2013). The recruitment of participants followed the convenience sampling method. Students were recruited via the Test Subject Pool (SONA) of the Behavioural, Management, and Social Science Faculty (BMS) of the University of Twente which forwarded them to the platform of 'Qualtrics'. As SONA operates as a token economy, students at the University of Twente were rewarded with 0.25 credits for their participation. Non-students were recruited through the researcher's social community, integrating the use of the snowballing method. The latter were invited by the provision of an online direct link to the 'Qualtrics' website. Before the start, each participant was asked for their consent after receiving information about the topic to be studied and their right to withdraw participation at any time. The study was submitted to the BMS faculty's Ethics committee for review prior to the start of data collection and obtained ethical approval. Participants were required to be at

least 18 years old and have proficient English language skills to meet this study's inclusion criteria. Also, a compliance rate of 100% of the three questionnaires was subject to the inclusion of data. Participants who did not meet those criteria were excluded from the sample.

G*Power version 3.1.9.7 (Faul et al., 2007) was used to perform an a priori power analysis to determine the minimal sample size needed to test this study's hypotheses. Results indicated *N* = 68 was required for conducting a regression analysis to obtain 80% power for detecting a medium effect (f2=0.15) according to Cohen's (1988) criteria at a significance level of α =.05. According to Schoemann et al.'s (2017) study on determining sample size and power for simple mediation, it was advised to use a sample size of 150 individuals to ensure a statistical power of at least 80% for detecting the hypothesized indirect effect. Considering the power analysis and prior literature, a sample size of at least 150 participants (N = 150) was targeted to test the hypotheses of the study.

Materials

One-time assessments for three different variables were collected via an online survey. Depending on the participants' references and resources, the survey could be entered either on a computer or via a smartphone. The survey used three selected items from the Distress Tolerance Scale to measure participants' distress tolerance levels. In addition, the Spirituality Scale and the Emotion Regulation Questionnaire were utilized to assess participants' trait spirituality and trait emotion regulation, respectively. The characteristics of these metrics are outlined in the following.

Spirituality scale

The Spirituality Scale (SS), established by Delaney (2003) consists of 23 items and needs to be answered on a 6-point Likert scale (1=strongly agree to 6= strongly disagree). Possible scores on the 23-item scale range from 23 to 138 (Delaney, 2005). Scores can be interpreted and grouped into four different levels of spirituality, indicating how important or to what extent spirituality is to or manifested by an individual (Delaney, 2005). According to Delaney (2003), scores between 23 and 60 are considered very low levels of spirituality, 61 to 91 are thought to be low levels of spirituality, 92 to 117 denote moderate levels of spirituality, and 118 to 138 are regarded as high levels of

spirituality. Another characteristic of the SS is its composition of three intercorrelated but distinguished factors (Delaney, 2005). Firstly, 'self-discovery' relates to a process of self-awareness and understanding and includes items such as "I see the sacredness of everyday life". Secondly, 'relationships' describes a sense of connection with others and incorporates items such as "I value maintaining and nurturing my relationships with others". Thirdly, 'eco-awareness' refers to a sense of connection with the environment and includes items such as "I have a relationship with a higher power / universal intelligence" (Delaney, 2005). Earlier studies claimed that this measure had good to excellent internal consistency (α = 0.81-0.94) and good test-retest reliability (α = .84) (Delaney, 2003; Liu & Robertson, 2011). Congruently, the current study indicated excellent levels of internal consistency (α = .90). Noteworthily, the 6-point Likert scale that was intended to be used was mistakenly replaced with a 7-point scale by the responsible researcher. As a necessary consequence, the original scale was reconstructed to integrate the actual scores that were obtained. The original scoring of the Spirituality Scale can be found in Appendix A. The reconstructed scoring levels are depicted in Table 1.

Table 1

Reconstructed Scoring of the Spirituality Scale

Scores	**Level of spirituality**
23-65	Very low level
66-96	Low level
97-127	Moderate level
128-161	High level

Emotion Regulation Questionnaire

The Emotion Regulation Questionnaire (ERQ), developed by Gross and John (2003), was used to measure students' ability to regulate emotions. It consists of 10 items which need to be answered on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). This self-report measure distinguishes the emotion regulation strategies of expressive suppression (ERQES) and

cognitive reappraisal (ERQCR). Four items assess students' expressive suppression, denoted for instance as "I control my emotions by not expressing them" (Gross & John, 2003), while six items, such as "When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about," demonstrate and compose the cognitive reappraisal facet (John & Gross, 2003). Scores are calculated by taking the average of all the scores from expressive suppression and cognitive reappraisal. The comparison of an individual's mean scores on each subscale identifies whether they make more frequent use of the adaptive strategy cognitive reappraisal or the maladaptive strategy expressive suppression. The ERQ has demonstrated high psychometric properties of validity and reliability, and factor analytical studies have concurred with the convergent and discriminant validity of the measure (Wiltink et al., 2011; Sala et al., 2012). Cognitive reappraisal (α = .89-.90) and expressive suppression (α = .76-.80) displayed good to excellent levels of internal consistency reliability across samples (Preece et al., 2019). Reliability analyses for this sample revealed good internal consistency of cognitive reappraisal (α = .84) and exhibited acceptable internal consistency of expressive suppression (α = .78).

Distress Tolerance Scale

The Emotional Distress Scale (DTS) by Simons and Gaher (2005) was used as a self-report measure of emotional distress tolerance. The entire questionnaire consists of 15 items which are rated on a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree) (Zvolensky, et al., 2011). Multidimensional factor analyses by Leyro et al. (2011) suggest four factors, namely 'Tolerance', 'Appraisal, 'Absorption' and 'Regulation'. Because this study focuses on one's ability to tolerate emotions and emotion regulation is already accounted for by the Emotion Regulation Questionnaire, this paper will solely use the three items representative of the factor 'Tolerance'. Therefore, this study's implemented scoring differs from the initial scoring procedure. Respondents' answers on "Feeling distress or upset is unbearable to me. ", "I can't handle feeling distressed or upset" and "There's nothing worse than feeling distressed or upset" indicate their ability to tolerate arousing emotions. Generally, lower scores demonstrate higher' distress tolerance. Within the implemented

subscale ‘Tolerance’, scores can range from 3 to 15 indicating three different levels of trait distress tolerance. Studies on the instruments’ psychometric properties report good internal consistency for the four-factored scale (α = .82) (Zvolensky, et al., 2011) as well as for the single factor ‘Tolerance’ (α = .84) (Van Eck et al., 2017). For this study, an acceptable internal consistency was found (α = .79). The scoring interval is listed in Table 2.

Table 2

Scoring of the Distress Tolerance Scale Items

Scores	**Level of Distress Tolerance**
3-6	Low level
7-12	Moderate level
13-15	High level

Procedure

Participants were directed to the online platform Qualtrics either via SONA or the direct weblink that was shared with them via email. The introductory page with background details about the study was displayed to the participants on the first screen. The informed consent form and the item asking for informed and voluntary participation were both located on the second screen. The survey began with demographic questions asking participants about their age, nationality, and gender they identify with. On the following pages, participants were provided with the SS, the ERQ, as well as the three excerpted items of the DTS. As requested by the publishers of the questionnaires (Gross & John, 2003) the item order was not modified. However, the questionnaire order was randomized to account for response bias (Perreault, 1975; Bowling, 2005). Also, this was deemed to secure participants were left unaware of the study's investigation of emotion regulation, and instead only briefing them on the focus on spirituality and distress tolerance. The last page of the webform debriefed this informational gap.

Data Analysis

The statistical programme IBM SPSS (version 28) was used to analyse the data. First, the survey data were downloaded in a dataset in CSV file format and then imported into SPSS. After screening the data based on the inclusion criteria, descriptive statistics were analysed. This entailed the calculation of means and corresponding standard deviations for the independent variable spirituality, the dependent variable distress tolerance, the mediating variable emotion regulation, as well as Pearson correlation coefficients describing linear relations between the three and the demographic variables age, gender, country of origin and current employment status.

To answer all four hypotheses, the proposed mediation model (see Figure 1) was tested by a model 4 mediation analysis of the 'PROCESS' macro tool v4.2 for SPSS by Hayes (2017). This approach served to determine the indirect, direct, and total effects between the independent, mediating, and dependent variable. Moreover, this analysis makes use of a bootstrapping technique. Bootstrapping techniques are advantageous over more conventional mediation techniques, such as the "causal steps approach" proposed by Baron & Kenny (1986), because they not only provide confidence intervals for the estimated parameter but also do not assume a normal distribution, making them capable of identifying significant effects when zero is not found in the 95% confidence interval (Horowitz, 2001; Hayes, 2009; Igartua & Hayes, 2021).

Results

Of the 238 participants who volunteered in the survey, a total of 52 (21.85%) participants were excluded from the analysis as 3.8% withdrew their initial consent after the debriefing and 18.05% did not finish the survey and hence did not fulfil the required 100% compliance rate. A final sample size of 186 participants remained. This met the requirements of the a priori power analysis and exceeded the targeted sample size of 150.

Descriptive Statistics

Measures of central tendencies were calculated to indicate participants' average scores on the demographic variables age, gender, country of origin and current employment status, and the

independent variable spirituality, the moderator emotion regulation, and the dependent variable distress tolerance. Moreover, Pearson correlation coefficients were computed to assess the linear relationships between those variables. Descriptive statistics revealed that participants had an averagely moderate level of trait spirituality (M = 109.04, SD = 20.30). Participants made more frequent use of the adaptive emotion regulation strategy cognitive reappraisal (M = 4.76, SD = 0.96) than of the maladaptive emotion regulation strategy expressive suppression (M = 3.44, SD = 1.19). Also, participants presented a moderate level of distress tolerance (M = 9.58, SD = 2.81).

Differences in the scores of students and non-students on the DTS, the SS, and the ERQCR were examined. The mean SS score was 107.74 (SD = 20.76) for the students and 113.37 (SD = 18.25) for the non-students. The mean ERQCR score was 4.76 (SD = 0.95) for the students and 4.75 (SD = 0.99) for the non-students. Finally, the mean DTS score was 9.60 (SD = 2.70) for the students and 9.5 (SD = 3.16) for the non-students. Results showed that there were no significant differences between students and nonstudents for any of the measures.

Significant correlations were found between gender and age, country and gender, employment status and age, employment status and gender as well as between DTS and gender. A Kruskal-Wallis Test was conducted to examine the differences in distress tolerance according to gender. Significant differences were found among the three categories of participants, namely non-binary, female, and male, X^2 (2) = 8.33, p = .016. Even though all three groups displayed moderate distress tolerance, the minority of participants who identified as non-binary (N = 4) had the highest DTS scores (M = 11.00), followed by respondents who identified as male (N = 60, M = 10.38), and then participants who identified as female (N = 122, M = 9.15). Moreover, there was a positive association between the SS and the ERQCR, r (186) = .29, p < .001. This indicates a small correlation between trait spirituality and the use of the emotion regulation strategy cognitive reappraisal (Cohen, 1988). Descriptive statistics and correlations are presented in Table 3.

Table 3

Descriptive statistics and correlations

Variable	n	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.
1. Age	186			1							
2. Gndr	186			.15*	1						
3. Cntry	186			-.08	-.15*	1					
4. E_stat	186			.75**	.18*	-.10	1				
5. SS	186	109.04	20.30	.12	-.10	.00	.10	1			
6. ERQCR	186	4.76	0.96	-.03	-.01	.03	-.02	.29**	1		
7. ERQES	186	3.44	1.19	-.07	-.04	.14	-.10	-.06	-.04	1	
8. DTS	186	9.58	2.81	-.08	.22**	-.14	-.09	-.08	.13	.05	1

Note. Gndr = Gender; Cntry = Country of Origin; E_stat = Current status of Employment; ERQCR = Emotion Regulation Strategy Cognitive Reappraisal; ERQES = Emotion Regulation Strategy Expressive Suppression.

Association between trait spirituality and distress tolerance

A mediation analysis was performed with the independent variable Spirituality, the dependent variable Distress Tolerance and the moderating variable Emotion Regulation. R^2 measured the variance explained by the predictor and the mediator after accounting for other variables in the model (Lachowicz et al., 2018). The partial correlation coefficient β assessed the effect strength of the association between two continuous variables while controlling for other variables. This effect size measure was calculated to determine the unique contribution of the predictor and the mediator to the outcome variable.

Hypothesis 1 proposed a direct association between trait spirituality and higher distress tolerance. The direct effect of spirituality on distress tolerance in absence of the mediator emotion regulation was found non-significant (β = -0.08, *SE* = 0.01, *t* = -1.03, *p* = .103) meaning that trait spirituality was not associated with higher distress tolerance. However, a regression analysis which distinguished between the three factors of the SS, namely self-discovery, relationships, and eco-awareness, suggested a moderate positive correlation between self-discovery and distress tolerance

(β = 0.32, *SE* = 0.05, *t* = 6.4 *p* < .001). This signifies that a one-unit increase in self-discovery is associated with a moderate increase in distress tolerance, holding the other variables constant. In terms of the mediation model, the direct effect between spirituality and distress tolerance was found non-significant.

Hypothesis 2, which predicted that trait spirituality is associated with the use of the more adaptive emotion regulation strategy, was supported. Spirituality was found to have a significant effect on the adaptive emotion regulation strategy cognitive reappraisal (β = 0.29, *SE* = 0.00, *t* = 4.13, *p* < .001). The regression coefficients denoted that with every unit of increase in spirituality (apart from the respondents' level of spirituality), the use of the emotion regulation strategy cognitive reappraisal increased by 0.01. Moreover, a linear regression was conducted to ascertain the extent to which trait spirituality was predictive of distress tolerance. Results of a linear regression analysis specified that spirituality predicted the emotion regulation strategy cognitive reappraisal by 8% (R^2 = .08, *F* (1, 184) = 17.05, *p* < .001). More specifically, the results of the regression analysis revealed there was a small positive correlation between spirituality's factor self-discovery and the use of cognitive reappraisal, (β = 0.19, *SE* = 0.02, *t* = 2.32, *p* = .021) as well as between the factor relationships and the use of cognitive reappraisal (β = 0.17, *SE* = 0.02, *t* = 2.09, *p* = .038). The relation between eco-awareness and the use of cognitive reappraisal was found non-significant (β = 0.06, *SE* = 0.01, *t* = 0.772, *p* = .441).

Hypothesis 3 assumed that the use of the more adaptive emotion regulation strategy is associated with a higher distress tolerance. Congruently, inferential results indicated a small but significant effect of the use of the more adaptive emotion regulation strategy cognitive reappraisal on distress tolerance (β = 0.17, *SE* = 0.22, *t* = 2.20, *p* = .029). In other words, the level of distress tolerance rose by 0.17 for every unit increase in the frequency that strategy was used.

Table 4

Coefficients for the mediating effect

Testing paths	*B*	*SE(B)*	β	*t*	95% *CI(B)*	
					LL	*UL*
Path c: DV = DTS						
R^2 = .01, *F* (1, 184) = 1.07, *p* = .30						
IV = SS	-.01	.01	*-.08*	-1.03	*-.03*	*.01*
Path a: DV = ERQCR						
R^2 = .90, *F* (1, 184) = 17.05, *p* < .001**						
IV = SS	.01	.00	.29	4.13	*.01*	*.01*
Path b and c' = DTS						
R^2 = .03, *F* (2,183) = 2.97, *p* = .054						
IV = SS (c')	-.02	.01	*-.13*	-1.64	*-.04*	*.00*
IV = ERQCR (b)	.49	.22	*.17*	2.20	*.05*	*.93*

Note. B = unstandardized coefficient; *CI* = Confidence Interval; *LL* = Lower Limit of the Confidence Interval; *UL* = Upper Limit of the Confidence Interval; DTS = Distress Tolerance Scale; SS = Spirituality Scale; Emotion Regulation Strategy 'Cognitive Reappraisal'.

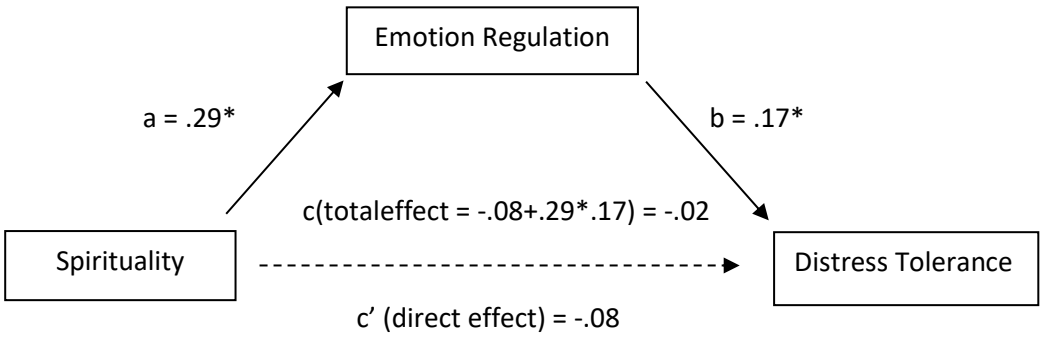
*p < .05. **p < .01, ***p < .001.

Hypothesis 4 suggested an indirect association between trait spirituality and higher distress tolerance through emotion regulation. The mediation analysis and an additional Sobel test found the indirect effect of spirituality on distress tolerance through emotion regulation to be significant (β = 0.01, *SE* = .00, *t* = 2.23, *p* = .025). This supports hypothesis 4 and means that the association between spirituality and distress tolerance was mediated through emotion regulation by 0.01. Lastly, the total effect of spirituality on distress tolerance was found non-significant (β = -.01, *SE* = .01, *t* = -1.03, *p* = .30). Linear regression coefficients are depicted in Table 4.

A summary of the mediation analysis is presented in Appendix B. Standardized regression coefficients are superposed on the statistical diagram of the mediation model in Figure 2.

Figure 2

Statistical Diagram of the Mediation Model



Note. Standardized coefficients. c' = direct effect of X on Y; c = combined effect of direct and indirect effect of X on Y; Dashed lines represent non-significant effects; solid lines represent significant effects.

*p < .05. **p < .01, ***p < .001.

Discussion

The main purpose of this study was to explore the mediating role of emotion regulation in the association between students' trait spirituality and tolerance for adverse emotional experiences. Contradicting the first hypothesis, trait spirituality is not directly associated with higher distress tolerance. In line with the second hypothesized association, trait spirituality relates to the use of a more adaptive emotion regulation strategy. Consistent with the third hypothesis, the use of a more adaptive emotion regulation strategy was associated with higher levels of distress tolerance. The fourth hypothesis is also supported by the data, which demonstrate that trait spirituality is indirectly associated with higher distress tolerance through emotion regulation. Overall, the data proposed that the association between spirituality and distress tolerance is fully mediated by emotion regulation. In the following discussion, these key findings will be compared to and contrasted with, the results of earlier research.

Comparison to previous research and theoretical implications

Spirituality and Distress Tolerance

Respondents who report higher levels of spirituality do not report higher distress tolerance. Yet prior studies have discovered a direct link between spirituality and distress tolerance. Mohammdipour et al. (2021) found spirituality to mitigate university students' distress tolerance and COVID-19-induced anxiety. Also, Tull et al. (2015) suggest that spirituality can provide a sense of transcendence and connectedness in life and with others, which can help individuals cope with adverse emotions by providing a broader perspective on perceived challenges. Additionally, McClintock et al. (2019) provided neurological evidence to support the notion that spirituality had an impact on neural processes linked to stress management, making it a crucial element for enhancing resilience. A possible explanation for the incongruencies of findings may be due to the various definitions and measurements these studies implied. For instance, Mohammadipour et al. (2021) used a single-item scale, whereas Tull et al. (2015) chose a multidimensional scale to assess spirituality. Apart from that, McClintock et al. (2019) also embedded religious beliefs in their conceptualization of spirituality, which psychosomatic research doubts to reflect an individual's overall level of spirituality (de Jager Meezenbroek et al., 2012).

Of the three components - self-discovery, relationships, and eco-awareness - that made up this study's conceptualization of spirituality, the data suggested that only self-discovery is directly related to a person's distress tolerance. Previous studies suggested self-discovery, which is a process of self-awareness and understanding, to be the single most reliable predictor of psychological well-being (Delaney, 2005). The results imply that trait spirituality alone may not be sufficient to predict distress tolerance and that other factors, such as emotion regulation strategies, may also play a role in predicting distress tolerance.

Spirituality and Cognitive reappraisal

Respondents with higher levels of trait spirituality make more frequent use of the adaptive emotion regulation strategy cognitive reappraisal. This aligns with the findings of Tull et al. (2015)

who suggested that spirituality influenced emotion regulation through a range of mechanisms, among others cognitive reappraisal. The latter is specified as reframing the meaning of a situation to regulate one's emotions. In addition, Jowkar and Kamali (2016), concluded that spirituality was associated with adaptive emotion regulation strategies and dedicated this to the fact that spirituality can provide individuals with a sense of meaning, purpose, and connection to something greater than themselves. This in turn can help to view stressful events in a more positive light (Jowkar & Kamali, 2016). Both studies found a positive association between spirituality and cognitive reappraisal but suggested different causal directions. Tull et al. (2015) proposed that spirituality can enhance cognitive reappraisal, while Jowkar and Kamali (2016) underlined that cognitive reappraisal can lead to increased spiritual well-being. Therefore, the direction of the relationship between spirituality and cognitive reappraisal remains ambiguous.

Further analyses revealed that trait spirituality explains 8% of the variance in the use of cognitive reappraisal. It is crucial to keep in mind, though, that the remaining 92% of the variation in the use of cognitive reappraisal are likely to be explained by other variables, including situational context, personality traits, and cultural influences (Gross & John, 2003; Mauss et al., 2007). So even though this finding is significant and marks a significant association between trait spirituality and cognitive reappraisal, it should not be taken as the only or final explanation for this connection.

Moreover, individuals who score higher on the self-discovery and relationships components of spirituality make more frequent use of cognitive reappraisal. Although both self-discovery and relationships show positive relations with cognitive reappraisal, self-discovery has a stronger influence than relationships. Studies that examined the practical implications of Positive Psychology have highlighted the potential benefits of self-discovery for the use of adaptive emotion regulation strategies, attributing this to the promotion of self-awareness and a deeper understanding of one's emotional triggers, sensitivities, and self-care practices (Rashid & Howes, 2016).

Thereby, it is crucial to remember that this study only looks at the specific emotion regulation strategy of cognitive reappraisal and other strategies, such as acceptance, positive reframing,

problem-solving or putting into perspective, may be more related to the factors of the Spirituality Scale (Simon & Gaher, 2005). Prior research also explored confounding factors like cultural variations in the association between spirituality and emotion regulation. In that regard, spirituality was found to be associated with the suppression of emotions in Asian cultures, while it is associated with the expression of emotions in Western cultures (Garland et al., 2015). This could not be detected by the present study, as the great majority (86.1%) of the sample originates from Germany and the Netherlands only.

Cognitive Reappraisal and Distress Tolerance

Participants who report a higher frequency of using cognitive reappraisal to regulate their emotions also report higher levels of distress tolerance. This is consistent with the findings of Jeffries et al. (2016), who found a link between the use of specific adaptive emotion regulation strategies, such as cognitive reappraisal or problem-solving, and higher distress tolerance, which ultimately led to a reduction in individuals' substance use and emotional avoidance. They reasoned that adaptive emotion regulation can help individuals reduce the negative effects of stress by reducing the intensity and duration of negative emotions, increasing positive emotions, and promoting a sense of control and mastery in the face of stress. Hence, individuals who tend to regulate their emotions adaptively, also showed a higher ability to tolerate negative emotional states without resorting to maladaptive behaviours or avoidance (Jeffries et al., 2016). This is supported by Akbari and Hossaini (2018), who found that adaptive emotion regulation mediated the effect of spirituality and the prevention of collapsing from stress in terms of burnout. Jeffries et al. (2016) assumed a different causality than hypothesized in this paper. The researchers proposed that individuals with higher distress tolerance approach adverse emotions and tolerate them for longer periods which would allow for a more considerate choice of following emotion regulation strategies. The cause of the discrepancies in causality between the constructs, as hypothesised in previous and current research, could be differences in the precision of the measures used. Compared to Jeffries et al. (2016), this

study implies a less precise measurement for distress tolerance, as it extracted the factor 'tolerance' from the original four-factor scale.

Spirituality, Cognitive Reappraisal and Emotional Distress Tolerance

The current study finds respondents' more frequent use of cognitive reappraisal to fully mediate the association between trait spirituality and one's ability to tolerate emotional distress. Noteworthily, the effect size of the indirect effect was found to be significant, but small. This proposes that the practical significance of such may be negligible or not observable in real-world settings. To synthesize, the findings suggest that the association between spirituality and distress tolerance may be complex and influenced by various factors not included in the investigation. In contrast, other studies have found that spirituality improved an individual's ability to tolerate stress, suggesting that this can be explained by the use of more adaptive emotion regulation strategies. This has been supported by research from Lafrance et al. (2021), Putri et al. (2020), and Tull et al. (2015). Additionally, Akbari and Hossaini (2018) found that spirituality incentivized the use of adaptive emotion regulation strategies, which lessened the negative effects of emotional exhaustion and prevented burnout. Similarly, Histari et al. (2020) contended that stress interventions should incorporate spirituality in combination with emotion regulation skills to offer a more holistic and culturally appropriate approaches.

The differences in previous research and the current study findings may be impacted by different cultural contexts, sample characteristics, and study designs. Although other studies also sampled university students (Tull et al., 2015; Putri et al., 2020; Lafrance et al., 2021) those were in Indonesia (Putri et al., 2020), the US (Tull et al., 2015), and Canada (Lafrance et al., 2021). Also, study samples of employees took place in Iran (Akbari & Hossaini, 2018) and Indonesia (Histari et al., 2020). The mean age of all studies' participants was at least 10 years higher than in the current investigation. Considerably, MacDonald et al. (2015) reported that spirituality varied significantly based on age and culture.

Strengths and limitations

The study's generalizability is both positively and negatively influenced by various aspects of its methodology. The hypothesised effect mechanism connects constructs that have not yet come under joint investigation. The novel innovation of this study thus lies in the integration of numerous disparate findings into a logical and theoretically sound model. On the positive side, the study employs a cross-sectional design that allows for the examination of the hypothesized between-subject associations between trait spirituality, emotion regulation, and distress tolerance. The study also has a sample size of 186 participants, which exceeds the targeted sample size of 150 and demonstrates sufficient statistical power to test the study hypotheses. For this sample, psychometrics tests show excellent internal consistency for the embedded spirituality scale and good internal consistency for the emotion regulation questionnaire. This supports the accuracy with which each respondent's self-report of spirituality and emotion regulation is assessed. The results show that none of the main findings are influenced by the participants' student status but instead apply to both students and non-students. The mixed sample of university students and non-student citizens ensures an increased generalizability of findings (Shepperd et al., 2013).

On the negative side, the limited transferability of the results to a wider population than the study participants cannot be completely ruled out due to the use of convenience sampling (Mullinix et al., 2015). The internal consistency of the items that assess distress tolerance is acceptable and thereby calls for improvement in the measurement. Since studies which use the four-factored DTS found higher reliability (Simons & Gaher, 2005; Jeffries et al., 2016), these shortfalls are supposedly caused by the reduced number of items. This limited reliability decreases the study's generalizability of results related to distress tolerance. Another limitation is that the study does not control for potential confounding variables, such as culture, ethnicity, gender, and age, that may influence the association between spirituality, emotion regulation, and distress tolerance (Koenig et al., 2015; Thompson et al., 2015). The extent to which respondents' expression of spirituality falls within an established community or is rather a private affair remains unexplored as well. In addition, the

measurement of spirituality uses a 7-point Likert scale instead of a 6-point scale, which may affect the comparability of the results with those of other studies that used the original 6-point scale. Finally, although the design of the cross-sectional study reveals statistically significant associations between spirituality, emotion regulation and emotional distress tolerance at a given point in time, it limits the possibility of drawing causal inferences about the modelled associations and possible changes over time (Lafrance et al., 2021).

Practical implications

By exploring people's ability to accept unpleasant emotional experiences before reacting to them, the investigation of the included variables ultimately aims to improve people's well-being. The following outlines the constructs' potential for practical application in academic and clinical contexts. Incorporating spiritual practices in university contexts has been shown to enhance emotion regulation and emotional distress tolerance among students (Urry & Poey, 2008; Zvolensky et al., 2010; Ma & Fang, 2019; Lafrance et al., 2021). A wide range of courses and interventions is deemed most supportive, as not every practice is equally effective for every individual. Giving students the chance to talk about their spiritual values and beliefs in a comforting, non-judgmental environment may encourage greater distress tolerance (Zvolensky et al., 2010; Garland et al., 2015). This could be accomplished within the framework of social support networks, which offer consolation, assistance, and direction during difficult times (Urry & Poey, 2008). Courses in mindfulness meditation, which focus to bring attention to the present moment without passing judgment, are another option to increase distress tolerance by fostering self-awareness of thoughts, emotions, and bodily sensations (Chiesa & Malinowski, 2011; Ma & Fang, 2019). A different form of meditation, transcendental meditation, involves a predominant mantra or sound to reach a state of deep relaxation, inner peace, and connection with a higher power. Several studies proved the effectiveness of this meditation to improve students' emotion regulation as well as increased ability to tolerate distressing emotions (Nidich et al., 2009; Sequeira et al., 2012). Yoga is one of the most spread ancient spiritual practices, which has persevered for so long that today yoga classes are one of the most popular ways to

improve mental and physical health at universities (Wei, 2018). By combining physical postures, breathing exercises and meditation, yoga is a holistic system for achieving a physical, mental, and spiritual balance that helps reduce stress and increase flexibility and strength (Büssing et al., 2012). Additionally, journaling classes could practice gratitude, as it has been demonstrated that doing so regularly lowers stress and increases positive emotions in students (Kerr et al., 2015). Lastly, reflective writing courses improve the spiritual aspect of self-discovery by teaching students to write about one's thoughts and feelings in an introspective manner (Baikie & Wilhelm, 2005). In sum, the various spiritual practices that demonstrate a positive effect on students' distress tolerance provide a compelling avenue for their inclusion in academic contexts.

Suggestions for future research

Based on the strengths, weaknesses and implications of the studies' findings, there are several recommendations for future research. First and foremost, a multimethodological assessment of distress tolerance could enhance the constructs validity (Conway et al., 2020). This entails the use of the four-factored DTS but supplemented by experimental measurements for behavioural components (Zvolensky, 2011). This could be achieved by implementing behavioural avoidance tasks, which enquire participants to either approach or avoid a situation that is prone to evoke emotional distress, such as public speaking. That allows for the examination of individuals' ability to tolerate distress in terms of persisting to display adaptive behaviours in the face of unpleasant emotional experiences (Conway et al., 2020).

Secondly, the use of a longitudinal study design could aid to determine the direction of influence between the variables, i.e., whether adaptive emotion regulation strategies predict higher levels of distress tolerance or vice versa. This approach has been recommended by Van Eck et al. (2016) and Lafrance et al. (2021) to gain a deeper comprehension of the causal relationships between these constructs and changes over time. To evaluate the effectiveness of interventions, Histari et al. (2020) recommend choosing quasi-experimental designs.

Thirdly, given the small amount of variance accounted for by spirituality in the use of cognitive reappraisal, results should be replicated among cross-cultural samples (Douglas et al., 2015). In light of this, the results of this study support the reuse of SS and ERQ as reliable measures. Notwithstanding, Hill et al. (2018) emphasize the value of combining the Spirituality Scale with a behavioural measure, such as a measure of frequency in spiritual practices, for instance, meditation or engagement in communities, to provide a more thorough evaluation of a person's level of spirituality.

Fourthly, the validity of findings should be increased to determine the interaction effects' applicability to real-world phenomena. This requires the incorporation of more confounding variables, such as culture, ethnicity, and age into the model (Koenig et al., 2015; Thompson et al., 2015). Additionally, the significant differences found between gender and distress tolerance at least raise the question of whether gender differences impact distress tolerance but do suggest the necessity to consider this demographic variable in future research. Rahmani et al. (2019) and Abbasi et al. (2019) reported a stronger association between spirituality and distress tolerance among women than men, while Snapp et al. (2021) found that higher distress tolerance was related to lower depression levels and greater resilience in non-binary individuals, suggesting a possible influence of gender identity on mental health. However, limited research on gender differences in distress tolerance calls for further investigation to gain a deeper understanding of this association. Based on comprehensive theoretical foundations, the model proposed in this study is recommended for further use in research, but with the inclusion of confounding variables. Furthermore, the model's generalizability could be strengthened further by utilizing a stratified sampling approach. This technique involves dividing the population into distinct subgroups based on characteristics such as gender, ethnicity, or affiliation to spiritual communities. Thereby the samples' diversity and representativeness become enhanced, and consequently the applicability of the results (Creswell, 2013).

Future research should explore the link between spirituality, emotion regulation, and distress tolerance in clinical settings, as integrating spiritual practices may decrease psychopathological symptoms and dysfunctional behaviours through greater utilization of adaptive emotion regulation strategies (Simons & Gaher, 2005; Zvolensky et al., 2011; Conway et al., 2020). Clinical practitioners may consider supporting their clients in developing a greater connection with themselves, others, and the world around them through a range of spiritual practices, such as, mindfulness practices, creative self-expression techniques, gratitude exercises, guided visualization, therapeutically guided reflective writing, or engagement in community groups (Malchiodi, 2002; Baikie & Wilhelm, 2005; Kerr et al., 2015; Huss & Sarid, 2017). It is critical to remember that not all clients may be receptive to spiritual practices in therapy. Thus, it is crucial to approach these practices with sensitivity and respect for the client's preferences and beliefs (Koenig et al., 2015).

Conclusion

In summary, the present study sheds light on the relationship between trait spirituality, emotion regulation, and distress tolerance. The leading question of this paper, whether the mechanism underlying the link between spirituality and distress tolerance can be explained by emotion regulation, can ultimately be answered. Even though cognitive reappraisal shows to statistically mediate the association between spirituality and distress tolerance, this relationship may not be observable in real-world situations. To unravel this, the study recommends future research to assess distress tolerance using a multimethodological measure composed of the four-factored DTS and a behavioural avoidance task. Additionally, using a stratified sampling approach to gather cross-cultural samples could help with the investigation of pertinent ethnic and cultural differences between individuals. The use of a cross-sectional design allows for the examination of the hypothesized associations between the variables of interest, while the integration of non-student citizens into the sample of university students increases the generalizability of findings. This study deems it worthwhile to explore the relationship between spirituality and distress tolerance in students, as academic stress and other demands in life make these individuals prone to dysfunctional

behaviours such as substance abuse. Instead of resorting to negative compensatory behaviours, spirituality can provide a source of support and a sense of connection, purpose and meaning that enables regulation of stressful sensations. All in all, the present study provides an explanatory model and thus a starting point for further investigations into how the spiritual feeling of connectedness with oneself, others, and the world around us affects individuals' regulation of difficult emotions and their ability to respond to emotional distress with self-accepting and sustainable behaviours.

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Appendix A

Original Scoring of the Spirituality Scale

Scores	**Level of spirituality**
23-60	Very low level
61-91	Low level
92-117	Moderate level
118-138	High level

Appendix B

Mediation Analysis Summary

Relationship	Total Effect	Direct Effect	Indirect Effect	Confidence Interval		*t*-statistics	Conclusion
				Lower Bound	Upper Bound		
Spirituality -> Emotion Regulation -> Distress Tolerance unstandardized	-.01	-.02	.01*	.00	.01	2.23	Full mediation
Spirituality -> Emotion Regulation -> Distress Tolerance standardized	-.02	-.08	.05*	.00	.10		

Note. *p < .05. **p < .01, ***p < .001.