Mindfulness, Difficulties in Emotional Regulation, Negative and Positive Affect as Predictors of Anxiety, Depression, and Psychological Distress in Early Adolescence

Bárbara Porter * , Cristian Oyanadel-Véliz , Yaranay López-Angulo , Wenceslao Peñate

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Article

Mindfulness, Difficulties in Emotional Regulation, Negative and Positive Affect as Predictors of Anxiety, Depression, and Psychological Distress in Early Adolescence

Bárbara Porter [1,*], Cristian Oyanadel-Véliz [2], Yaranay López-Angulo [2] and Wenceslao Peñate [3]

[1] School of Midwifery and Obstetrics, Faculty of Health Care, Universidad San Sebastián, Concepción 4030000, Chile
[2] Department of Psychology, Faculty of Social Sciences, Universidad de Concepción, Concepción 4030000, Chile
[3] Clinical Psychology, Psychobiology and Methodology School, Psychology Faculty, Guajara Campus, La Laguna University, 38200 Santa Cruz de Tenerife, Spain
* Correspondence: barbara.porter@uss.cl

Background/Objectives: The high prevalence of anxiety and depression in early adolescents, along with the significant disability these conditions, represent a major challenge for mental health. This data underscores the need to understand the variables that predict mental health in this developmental period. **Objective:** Evaluate the predictive role of mindfulness, difficulties in emotional regulation, and positive and negative affect on anxiety, depression, and psychological distress at the end of childhood and the beginning of adolescence. **Method:** A cross-sectional predictive design was carried out, evaluating 259 children and early adolescents aged 8 to 12 years. Multiple regression analyses were conducted using the stepwise method to determine the predictive capacity of mindfulness, difficulties in emotional regulation, and positive and negative affect on anxiety, depression, and psychological distress. **Results:** Difficulties in emotional regulation have a predictive role on anxiety and depression; negative affect on anxiety and psychological distress; and low positive affect (anhedonia) on depression. Low levels of dispositional mindfulness presented a predictive role on depression and psychological distress. **Conclusion:** Strengthening skills such as emotional regulation and mindfulness during this period of life could be important for the prevention of highly prevalent mental health disorders that have a negative and prolonged impact on adolescents' lives.

Keywords: mindfulness, emotional regulation, positive affect, negative affect, anxiety, depression, psychological distress, adolescence

1. Introduction

Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn and work well, and contribute to their community [1–3]. In children and adolescents, developmental aspects such as a positive sense of identity, the ability to manage cognitions and emotions, to create social relationships, to learn, and to participate actively in society are emphasized [4]. Neuropsychiatric disorders are the main cause of health problems during the first three decades of life, accounting for 15% to 30% of the lost years due to disability or death (DALYs) [5,6]. For the population aged 1 to 9 years, 30.3% of DALYs are due to neuropsychiatric disorders, increasing to 38.3% in the age group between 10 and 19 years. In Chile, the highest

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prevalence in child and adolescent mental health is given by 21.8% of disruptive disorders, 18.5% of anxiety disorders, 6.1% of affective disorders, and 4.8% of substance use, with a total overall prevalence of 38.3% [7,8]. Only 33.3% of the children and adolescents who present behavioral, emotional, psychiatric, or substance use problems, had sought formal or informal help in the previous year. The most frequent sources of help were educational services (18.1%). However, the majority (66%) of children or adolescents with mental disorders did not receive any type of professional care [8,9].

Comorbidity and bidirectionality between anxiety and depression is high [10,11]. According to Clark and Watson [12] tripartite model, there is an association between anxiety, depression, and negative affect. This model is based on three main components: (1) Negative affect: A common factor in both anxiety and depression, referring to general feelings of discomfort, irritability, and discontent; (2) Physiological hyperarousal: Specific to anxiety, including symptoms such as muscle tension, sweating, and increased heart rate; (3) Anhedonia (decreased positive affect): Specific to depression, referring to the difficulty in experiencing pleasure and the loss of interest in previously enjoyable activities. Psychological distress is understood as a general measure of discomfort, including anxiety, sadness, and irritability, and is often associated with greater physical morbidity, reduced quality of life, and increased use of health services [13].

The onset age of mental disorders occurs earlier than previously estimated and has lasting effects throughout life, presenting high disability rate [14–16]. Specifically, anxiety and depression typically begin in childhood or adolescence and tend to become chronic during adulthood [14,17,18]. Failure to address child and adolescent mental health problems has significant consequences, as they hinder the achievement of basic developmental aspects [6,19–21]. Specifically, in children and adolescents, depression and anxiety are the most prevalent diagnoses and have significant developmental effects [22]. Prevention, along with early and timely care, are fundamental aspects [23,24]. Identifying and understanding the role of mental health predictor variables is essential.

Evidence indicates that mindfulness and emotional regulation are predictors of mental health [25–27]. Mindfulness has been defined as the ability to pay attention in a particular way, on purpose, in the present moment, without judgment [28,29]. It is considered a construct with two components: (1) self-regulation of attention, which is maintained on immediate experience, and (2) orientation towards one's present experience characterized by curiosity, openness, and acceptance [30]. Mindfulness practice facilitates the reduction of symptoms related to depression [31–33], anxiety [34,35], and stress [36,37]. Evidence suggests that it facilitates well-being in children and young people [38–42] and that trait mindfulness is a predictor of mental health in university students [43]. A significant effect of mindfulness practice on emotional regulation has been observed [44,45]. Emotional regulation is defined as the ability to modify the way emotions are experienced and expressed [46–50]. It is essential for achieving developmental milestones such as social and emotional well-being, as well as academic functioning [51,52] and has been proposed as a central aspect of youth mental health [53]. The moderating effect of emotional regulation over the harmful impact of adverse childhood experiences has been demonstrated, mediating mental and physical health [54]. Emotional dysregulation in childhood is associated with higher rates of anxiety and affective disorders [52,55], highlighting its role as a predictor of depressive symptoms in adolescence [56].

The high prevalence of mental disorders, the low tendency to seek help, and the high rate of disability associated with them, emphasizes the need to understand mental health predictors in the transition period between childhood and adolescence. The objectives of this study are:

1. Analyze the correlation between dispositional mindfulness, difficulties in emotional regulation, anxiety, depression, and positive and negative affect in children and young people aged 8 to 12 years.
2. Evaluate predictive models for anxiety, depression, and psychological distress (sum of anxiety and depression), considering the variables: mindfulness, difficulties in emotional regulation, positive and negative affect.

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2. Materials and Methods

A cross-sectional predictive design was carried out [57]. This research is part of the doctoral project "Effects of two mindfulness-based programs on attentional, emotional, and behavioral self-regulation in children and adolescents aged 8 to 12 years" (for more information on this project, check [58]). Participants were evaluated before and after the interventions. For the present research, baseline data were considered.

2.1. Participants

The sample consisted of 259 children and adolescents aged 8 to 12 years (M=9.93, SD=0.95), comprising 126 girls (49%) and 133 boys (51%). Convenience sampling was used, employing a snowball technique through social networks and contact email databases. Data was collected between November 2020 and May 2021.

2.2. Instruments

1. Child and Adolescent Mindfulness Measure (CAMM) is a self-report test that assesses trait mindfulness in children and adolescents aged 9 to 18 years [59]. It has been validated in the Chilean population [60]. CAMM uses a 5-point Likert scale ranging from 0 (never) to 4 (always) and includes 10 items. In the Chilean adaptation, the scale was reduced to seven items, as three items from the original test had very low factor loadings. The scale showed a reliability of .67 for Chilean children (8 to 12 years) and .85 for Chilean adolescents (13 to 19 years).

2. Difficulties in Emotion Regulation Scale, (DERS) [48,61] in its Chilean adaptation [62] was used to assess emotional regulation. Factor analysis showed a better fit for the 5-factor model with 25 items. The internal consistency of the subscales ranged from .69 to .89, with an overall index of .92 for both samples [62]. The 25-item and 5-factor version validated in the Chilean population was adapted by modifying some words based on cognitive interviews and expert judges' opinions [63]. The 5-factor structure is formed by: (1) emotional rejection (difficulty accepting one's own distress); (2) lack of emotional control (difficulties regulating difficult emotions); (3) daily interference (difficulties completing tasks while experiencing difficult emotions); (4) emotional neglect (difficulties paying attention to and recognizing emotions); (5) emotional confusion (difficulty clearly identifying the emotions being experienced). Higher scores indicate greater difficulties in emotional regulation.

3. Hospital Anxiety and Depression Scale (HADS) by Zigmond and Snaith [64]. The version adapted for the Chilean adolescent population validated by González-Loyola, Oyanadel [65] was used. The original scale [64] consists of 14 items, divided into two subscales (anxiety and depression). The adapted version [65] consists of 12 items, scored on a 4-point Likert scale. It is validated in the Chilean population, specifically in children and adolescents, suitable for application in the age range of 8 to 16 years, with an $\alpha = 0.75$ for the anxiety subscale and 0.65 for the depressive mood subscale.

4. Positive and Negative Affect Schedule, (PANAS) Watson, Clark [66]. This scale consists of 2 subscales: Positive Affect and Negative Affect, with a total of 20 items on a 4-point Likert scale (from "not at all" to "very much"). The version adapted for the Chilean adolescent population [67] was used. The reliability of the version adapted for Chilean adolescents showed a Cronbach's α of .85 for positive affect and .83 for negative affect. There are no cutoff scores for this scale. The range per subscale goes from 10 points to a maximum of 40.

2.3. Procedure

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Parents and guardians were contacted, and after being informed about the project, they signed an informed consent form. Then, their children accessed an informed assent form via link, which granted access to the battery of tests. Everything was conducted online through a survey created on the Surveymonkey platform. The research project was approved by the ethics committee of the University of Concepción.

2.4. Data Analysis

The normality of the data was analyzed using Kolmogorov-Smirnov test. The assumption of linearity was then evaluated through the inspection of partial scatter plots. Homoscedasticity was assessed by analyzing the residual scatter plots. Multicollinearity was evaluated using the variance inflation factor (VIF), which had to be less than 5. To meet the assumption of independence of residuals, Durbin-Watson test was used, which had to be between 1.5 and 2.5. Outlier diagnosis was performed using Cook's distance, with a threshold of 1 or less.

After the assumption checks, descriptive analyses were conducted. To determine the degree of association between variables, Spearman's correlation was used, as the distribution did not meet normality. Finally, multiple regression analyses were performed using the stepwise method to determine the predictive capacity of the variables on anxiety, depression, and psychological distress. Based on these analyses, statistically significant predictive models were obtained, which will be presented in the results. The statistical analysis was conducted using SPSS v.25.

3. Results

Descriptive statistical analyses of all variables were conducted as reported in Table 1.

Table 1. Descriptive Statistics.

Variables	M	SD	CI 95%
Mindfulness	17.919	6.944	17.069, 18.769
Difficulties in emotional regulation	62.405	16.544	60.381, 64.430
Anxiety	8.544	3.941	8.062, 9.027
Depression	8.660	3.859	8.188, 9.132
Positive affect	33.108	5.271	32.463, 33.753
Negative affect	19.282	6.400	18.499, 20.065
Psychological Distress	30.239	5.719	18.000, 48.000

Note: M = mean score; SD = standard deviation; CI = confidence interval

Kolmogorov-Smirnov statistics were used as a goodness-of-fit test. Since a normal distribution was not observed in the variables, Spearman's correlation was selected (Table 2).

Table 2. Spearman correlation.

Variable	Spearman´s Rho / p	Mindfulness	Difficulties in emotional regulation	Anxiety	Depression	Positive affect	Negative affect
1.Mindfulness	Rho	—					
	p	—					
2. Difficulties in emotion regulation.	Rho	0.126	—				
	p	0.043	—				
3. Anxiety	Rho	0.146	0.519	—			
	p	0.019	< .001	—			

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4. Depression	Rho	0.426	-0.105	0.072	—		
	p	< .001	0.090	0.250	—		
5. Positive	Rho	-0.328	-0.200	-0.230	-0.483	—	
affect	p	< .001	0.001	< .001	< .001	—	
6. Negative	Rho	0.125	0.492	0.605	0.125	-0.412	
affect	p	0.044	< .001	< .001	0.045	< .001	
7.	Rho	0.437	0.232	0.694	0.734	-0.462	0.466
Psychological distress	p	< .001	< .001	< .001	< .001	< .001	< .001

Note: Rho: Spearman's correlation coefficient.; p: p value, statistical significance.

Moderate correlations were observed between mindfulness, depression, positive affect, and distress; difficulties in emotional regulation with anxiety and negative affect; anxiety and negative affect; depression with positive affect; and positive affect with negative affect. Using stepwise method, regression models were tested to determine the predictive capacity of the variables on anxiety (model 1), depression (model 2), and psychological distress (model 3), as detailed below.

3.1. Predictive Model of Anxiety

A multiple regression analysis was conducted to determine the association between mindfulness, difficulties in emotional regulation, depression, positive affect, and negative affect as predictors of anxiety (Table 3).

First, the assumptions were checked. Homoscedasticity was analyzed using the residual plot, which showed that the residuals were randomly distributed (without forming systematic patterns), suggesting that homoscedasticity is present. Regarding the assumption of multicollinearity, there were no predictors showing very high linear correlation or variance inflation, as the VIF values ranged between 1.00 and 1.415. The outlier diagnosis using Cook's distance indicated that there were no influential cases, as the indicators were less than 1. The independence of residuals was evaluated using the Durbin-Watson test, which yielded values between 1.989 and 1.632, within the normal range of 1.5 to 2.5.

Subsequently, a multiple linear regression analysis was conducted to predict anxiety based on mindfulness, emotional regulation, depression, positive affect, and negative affect. The model was significant, $F(2,256) = 119.280$, $p < .001$, explaining 48.2% of the variance in anxiety.

The results of the standardized coefficients showed that negative affect ($\beta = .447$, $p < .001$) and difficulties in emotional regulation ($\beta = .342$, $p < .001$) were significant predictors of anxiety, while mindfulness, depression, and positive affect were not.

Table 3. Regression Coefficients for Anxiety.

Model		*B*	SE	β	t	p
M_0	(Intercept)	14.579	0.251		58.158	< .001
M_1	(Intercept)	6.895	0.619		11.141	< .001
	Negative affect	0.399	0.030	0.632	13.079	< .001
M_2	(Intercept)	3.941	0.738		5.339	< .001
	Negative affect	0.282	0.034	0.447	8.350	< .001
	Dificulties in emotional regulation	0.083	0.013	0.342	6.398	< .001

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Model	*B*	SE	β	t	p

Note: B: regression coefficient; SE: standard error; β: standardized regression coefficient; t: t value; p: p value, statistical significance.

3.2. Predictive Model of Depression

The aim of the analysis was to determine the association between mindfulness, difficulties in emotional regulation, anxiety, positive affect, and negative affect as predictors of depression (Table 4).

To check for the presence of homoscedasticity, the residual plot was analyzed, which showed that the residuals were randomly distributed (without forming systematic patterns). Regarding the assumption of multicollinearity, there were no predictors showing very high linear correlation or variance inflation, as the VIF values ranged between 1.00 and 1.091. The outlier diagnosis using Cook's distance indicated that there were no influential cases, with a threshold greater than 1. The independence of residuals was evaluated using the Durbin-Watson test, which yielded values between 2.000 and 1.509, within the normal range of 1.5 to 2.5.

Table 4. Regression Coefficients for Depression.

Model		*B*	SE	β	t	p
M_0	(Intercept)	15.660	0.240		65.309	< .001
M_1	(Intercept)	10.743	0.579		18.548	< .001
	Mindfulness	0.274	0.030	0.494	9.104	< .001
M_2	(Intercept)	18.472	1.543		11.969	< .001
	Mindfulness	0.231	0.030	0.416	7.773	< .001
	Positive affect	-0.210	0.039	-0.287	-5.360	< .001
M_3	(Intercept)	22.140	1.709		12.956	< .001
	Mindfulness	0.238	0.029	0.429	8.284	< .001
	Positive affect	-0.228	0.038	-0.311	-5.981	< .001
	Dificulties in emotional regulation	-0.052	0.012	-0.221	-4.393	< .001

Note: B: regression coefficient ; SE: standard error ; β: standardized regression coefficient; t: t value; p: p value, statistical significance.

After verifying the fulfillment of the assumptions, a multiple linear regression analysis was conducted to predict depression based on mindfulness, emotional regulation, anxiety, positive affect, and negative affect. The model was significant, $F(3,255) = 49.491$, $p < .001$, explaining 36.8% of the variance in depression.

The results of the standardized coefficients showed that mindfulness ($\beta = .429$, $p < .001$), positive affect ($\beta = -.311$, $p < .001$), and difficulties in emotional regulation ($\beta = -.221$, $p < .001$) were significant predictors of depression, while negative affect and anxiety were not.

3.3. Predictive Model of General Psychological Distress

A multiple regression analysis was conducted to determine the association between mindfulness, difficulties in emotional regulation, positive affect, and negative affect as predictors of general psychological distress, understood as the sum of anxiety and depression (Table 5). This is

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consistent with Clark and Watson's (1991) tripartite model, which posits that negative affect is associated with both anxiety and depression.

The assumptions were evaluated, starting with the analysis of the residual plot to check for homoscedasticity, which was confirmed given the random pattern observed in the data distribution. Regarding multicollinearity, VIF values ranged between 1.00 and 1.221, indicating no predictors with very high linear correlation or variance inflation. The outlier diagnosis using Cook's distance indicated no cases with a threshold greater than 1. The Durbin-Watson test was used to evaluate the independence of residuals, yielding values between 1.746 and 1.703 for models 2 and 3, which are within the normal range of 1.5 to 2.5. Model 1 yielded a Durbin-Watson index of 1.241, suggesting positive autocorrelation in the residuals for this model, specifically for negative affect and general psychological distress.

Table 5. Regression Coefficients for Psychological Distress.

Model		*B*	Standard Error	β	t	p
M_0	(Intercept)	30.239	0.355		85.101	< .001
M_1	(Intercept)	21.561	0.978		22.044	< .001
	Negative affect	0.450	0.048	0.504	9.346	< .001
M_1	(Intercept)	16.561	1.069		15.494	< .001
	Negative affect	0.408	0.043	0.456	9.413	< .001
	Mindfulness	0.324	0.040	0.394	8.123	< .001
M_2	(Intercept)	24.452	2.572		9.508	< .001
	Negative affect	0.356	0.045	0.399	7.880	< .001
	Mindfulness	0.291	0.040	0.353	7.204	< .001
	Positive affect	-0.190	0.057	-0.175	-3.360	< .001

Note: B: regression coefficient ; SE: standard error ; β: standardized regression coefficient; t: t value; p: p value, statistical significance.

A multiple linear regression analysis was conducted to predict general psychological distress based on negative affect, mindfulness, emotional regulation, and positive affect. The model was significant, $F(3,255)=64.588$, $p<.001$, explaining 43.2% of the variance in general psychological distress. The results of the standardized coefficients showed that negative affect ($\beta=.399$, $p<.001$), mindfulness ($\beta=.353$, $p<.001$), and positive affect ($\beta=-.175$, $p<.001$) were significant predictors of general psychological distress, while difficulties in emotional regulation were not.

4. Discussion

The first aim of this research was to analyze the correlation between dispositional mindfulness, emotional regulation, anxiety, depression, general psychological distress, positive and negative affect in children and adolescents aged 8 to 12 years. A direct and significant correlation was observed between mindfulness, difficulties in emotional regulation, anxiety, depression, and negative affect.

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The relationship between mindfulness and positive affect was inverse and significant. This is consistent, as in the test used, the Child and Adolescent Mindfulness Measure [60], a higher score implies lower mindfulness. The literature indicates a moderate association between mindfulness and emotional regulation [63]. Similarly, a lower level of dispositional mindfulness is associated with higher levels of anxiety and depression [68,69]. On the other hand, higher levels of mindfulness are correlated with greater well-being and positive affect [69–71]. Additionally, a significant, direct, and moderate correlation (0.519) was observed between anxiety and difficulties in emotional regulation, which is consistent with the literature [72,73]. Direct, significant, and moderate relationships were observed between negative affect and difficulties in emotional regulation (0.492), anxiety (0.605), and an inverse and moderate relationship with positive affect (-0.412). Furthermore, positive affect inversely correlated with anxiety, depression, distress, difficulties in emotional regulation, and mindfulness. Evidence indicates that positive affect is associated with well-being and life satisfaction [74], being effective in treating people with anxiety and depression [75]. The second objective refers to the predictive capacity of mindfulness, negative affect, positive affect, and difficulties in emotional regulation on anxiety, depression, and general distress, understood as the sum of depression and anxiety indices. Results indicated that a low level of dispositional mindfulness could be a predictor of depression and general distress. This is consistent with the literature [76,77]; while difficulties in emotional regulation predicts depression and anxiety [73,78]. Regarding anxiety, the predictors are negative affect and difficulties in emotional regulation, explaining 48.2% of the variance. The predictors of depression would have low positive affect (anhedonia), low levels of dispositional mindfulness, and difficulties in emotional regulation, explaining 36.8% of the variance. These results are consistent with Clark and Watson [12] tripartite model, as negative affect is confirmed as a predictor of anxiety and general distress [79], while anhedonia (low positive affect) was confirmed as a predictor of depression. The common denominator for both anxiety and depression would be difficulties in emotional regulation, emphasizing the importance of this skill for the prevention and promotion of mental health in adolescence [79,80]. On the other hand, the predictors of general psychological distress, understood as the convergence of anxiety and depression, would be decreased positive affect (anhedonia), negative affect, and mindfulness. Low levels of mindfulness would be predictors of both general distress and depression in early adolescence, emphasizing the importance of introducing young people to this practice to prevent mental health problems.

This study has several limitations. The sample size is relatively small, which could affect the external validity of the results. The self-report instruments applied to children and adolescent population imply a possibility of bias in the results due to reading comprehension difficulties. It will be necessary to include third-party informants such as parents, guardians, and/or teachers, as well as other types of evaluations, such as computerized or performance tests, to avoid relying exclusively on paper-and-pencil tests [81]. Future research lines can expand the findings of this study from a developmental perspective, including children under 8 years old and adolescents over 12 years old, to have models that allow us to understand the trajectory of mental health predictor variables from childhood to late adolescence. Interventions can be designed to accompany children and adolescents, focusing on those skills that predict better mental health.

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Institutional Review Board Statement: This study was conducted according to the guidelines of the Helsinki Declaration and approved by the Ethics Committee of the Universidad de Concepción, code 01122018.

Compliance with Ethical Standards: Informed consent was obtained from all the caregivers, and informed assent was obtained from all minors involved in the study.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest.

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