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Examining academic self-concept as a mediator of the relationship between anxiety and depression: A longitudinal study

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Background: Self-concept plays a role as a mediator in the development and maintenance of internalizing symptoms but mechanisms through which the early presence of anxiety symptoms is associated with the subsequent development of depression is unknown. The aim of this longitudinal study was to analyze the mediating role of different areas of self-concept in the relationship between the early development of anxiety symptoms and the later appearance of depressive symptoms. **Methods:** A longitudinal study with 3 time-points was conducted, including baseline, 2 months and 12 months from the baseline assessment. A total of 217 children aged 8–12 years participated. Mediation analyses were conducted using PROCESS Macro for SPSS. **Results:** Academic self-concept (Time 2) mediated the relationship between Anxiety (Time 1) and Depression (Time 3) when controlling for children's sex and, age, baseline value of the mediator, anxiety (at Times 2 and 3), and depression (at Times 1 and 2). Children with self-reports of higher anxiety symptoms (Time 1) presented lower Academic self-concept (Time 2). Children who reported lower levels of Academic self-concept and Family self-concept (Time 2) were more likely to develop depressive symptoms (Time 3). **Conclusions:** Feeling competent in the school environment may be considered a protective factor against the development of depression in childhood. The identification of risk factors facilitates the development and implementation of preventive programs.

Key Practitioner Message

- Self-concept plays a role as a mediator in the development and maintenance of internalizing symptoms, including anxiety and depresion. Mechanisms through which the early presence of anxiety symptoms is associated with the subsequent development of depression are unknown.
- Children with self-reports of higher anxiety symptoms presented lower Academic self-concept. Children who reported lower levels of Academic self-concept and Family self-concept were more likely to develop depressive symptoms.
- Self-concept is an area to which special attention must be paid by school agents. Strategies aimed at improving the academic self-concept of children, especially those with early symptoms of anxiety, could prevent the future onset of depression and consequently reduce the cost in the health system.

Keywords: Self-concept; school children; anxiety; depression; mediation

Introduction

Up to 50% of psychological problems in adults begin before the age of 14, according to the World Health Organization (WHO, 2013). In the Mental Health Action Plan 2013–2020, the WHO (2013) mentioned the need to identify risk and protective factors that facilitate the implementation of preventive psychological programs in children and adolescents. Particularly, these developmental stages are critical for the onset and development of anxiety and depressive disorders (Cohen, Andrews, Davis, & Rudolph, 2018).

Prevalence rates of depression and anxiety in Spanish children are 4% and 11.8%, respectively (Canals, Voltas, Hernández-Martínez, Cosi, & Arija, 2019; Jaureguizar, Bernaras, & Garaigordobil, 2017), and the comorbidity rates between the two disorders are very high, around 50–72% (Essau, Lewinsohn, Olaya, & Seeley, 2014). Evidence suggests the existence of a relationship between the early onset of anxiety disorders and the later development of depressive symptoms (Craske & Zucker, 2001; Essau et al., 2014). In fact, most studies of comorbidity have examined anxiety disorders as a predictor of depression (Garber & Weersing, 2010). The prevalence rates are even more alarming if we assume that many children with anxiety symptoms will not receive any treatment (Fisak, Richard, & Mann, 2011). Regarding their consequences, childhood emotional disorders are usually associated with negative outcomes, such as poor academic performance, social and family problems, and suicide (Garaigordobil, Jaureguizar, & Bernarás, 2019). Moreover, depressed children are more likely to suffer from depression in adulthood (Mccabe, Ricciardelli, & Banfield, 2011).

One of the main cognitive vulnerability factors for the development of depressive and anxiety disorders is a negative self-perception (Bajaj, Robins, & Pande, 2016; Van Tuijl, De Jong, Sportel, De Hullu, & Nauta, 2014). This phenomenon refers to the self-concept, defined as a person's perception of themselves in different areas of their life (Harter, 2012). According to García and Musitu (1999), self-concept can be considered to have to five areas: *academic self-concept*, perceived quality of one's performance in the school environment; *social self-concept*, perception of the quantity and quality of interpersonal relationships; *emotional self-concept*, control over one's emotions and functional responses in specific situations; *family self-concept*, perception of one's involvement and participation in the family; and *physical self-concept*, which includes the perception of one's appearance and physical/sports condition.

A positive self-concept facilitates one's understanding of the environment and the maintenance of adequate social relations, promoting well-being and a good psychological adjustment in children (Chavez-Hernandez et al., 2018). On the contrary, a low self-concept is related to the development of internalizing symptoms (Bernaras, Garaigordobil, Jaureguizar, & Soroa, 2018; Spilt, van Lier, Leflot, Onghena, & Colpin, 2014). Specifically, a low self-concept has been considered as a predictor of depression and suicidal behavior (Chavez-Hernandez et al., 2018; Garaigordobil, Bernarás, Jaureguizar, & Machimbarrena, 2017). In fact, in a study conducted with Spanish children aged 7–10 years (Garaigordobil et al., 2017), low family self-concept and high anxiety were considered causal variables of depression. Regarding anxiety, although it is known to be negatively associated with self-concept, Goetz, Cronjaeger, Frenzel, Lüdtke, and Hall (2010) highlighted the remarkable scarcity of empirical evidence in this area.

Despite the progress achieved, the nature of the relationship between self-concept and depression is not entirely clear (Wu & Kuo, 2015), so it is still necessary to identify specific mechanisms that associate anxiety disorders with depression (Garber & Weersing, 2010). Hence, Swann, Chang-Schneider, and McClarty (2007) emphasized the need to analyze how, when, and with what consequences the perception of oneself influences one's quality of life. Mediation analyses can be very useful in establishing the nature of the underlying relationships between different psychological problems and/or risk and protective factors (Dhondt, Healy, Clarke, & Cannon, 2019).

In childhood, cognitive, social, and emotional processes are under development (Bernaras, Jaureguizar, & Garaigordobil, 2019). Similarly, greater cognitive development and social comparison favor the development of the self-concept (Amado-Alonso, Mendo-Lázaro, León-del-Barco, Mirabel-Alviz, & Iglesias-Gallego, 2018; Fernández & Goñi, 2008). Therefore, the study of these variables seems especially important between 6 and 12 years, the period of Compulsory Primary Education, when socialization is promoted, and children's development not only takes place in the family environment (Amado-Alonso et al., 2018).

In the present longitudinal study, mental health was considered as a multidimensional state of well-being, determined through the study of negative indicators (anxiety and depression) and positive factors (self-concept) (Dale, Vanderloo, Moore, & Faulkner, 2019). Considering that the early onset of anxiety symptoms is related to the later appearance of depressive symptoms, and that self-concept could play a mediating role in this relationship, the main objective of this study was to analyze the possible mediating effects of self-concept (academic, social, emotional, family, and physical) (Time 2) on the relationship between anxiety (Time 1) and long-term depression (Time 3). In accordance with some previous studies (Chavez-Hernandez et al., 2018; Garaigordobil et al., 2017), we expected to find a relationship between anxiety symptoms and the subsequent development of depressive symptoms through the mediating role of self-concept. In this sense, a low self-concept (physical, emotional, family, academic, and social) was expected to be indirectly related to the development of depressive symptoms (Figure 1).

Methods

Ethics

The current study was approved by the Ethics Committee of the authors' institution (DPS.MO.02.14). The Ethics Committee of the Miguel Hernández University (Spain) ensured that the informed consent included all the necessary information for the families to understand the purpose of the study and the possibility of leaving the study at any time. The confidentiality of the data was assured, assigning a code to each participant (Appendix S1).

Study design

This longitudinal study – including three time-points – is part of a broader project aimed at the analysis and study of emotional problems in children.

Participants

A total of 217 children (8–12 years) from the general population in south-eastern Spain participated. All were recruited from five private and five public schools ($N = 10$) of Alicante (Spain). Two months after the baseline assessement (Time 2), 211 children again completed the survey (97.2% retention), and 12 months later (Time 3), 210 children were again evaluated (96.8% retention). No differences were found in children's sex, age, and grade between those who dropped out and those who participate at Times 2 and 3 ($p > .05$).

Data collection

This study is part of a larger project aimed at understanding children's emotional problems. For this purpose, 12 school principals were contacted by email. Finally, 10 of them agreed to participate in the study, so information on the study was distributed to the parents of children aged 8–12 years. Permissions from the school and informed written consent signed by the families of the children who agreed to be part of the study were obtained. Data collection was carried out at the schools. A psychologist was in charge of explaining the aim of the study to the children and supervising the completion of the questionnaires on paper. The administration of questionnaires was carried out in groups of 10 children. The evaluation was carried out at three time-points. In Spain, the academic year starts in September–October and finishes in June. The first assessment was conducted in March–April, Time 2 at 2 months later (June) and Time 3 at 12 months from the baseline assessment (March–April 1 year later). Each evaluation was carried out on two different days to also obtain data from the children who had not been present on the first day of evaluation. No incentives were provided.

Methods

Children's Depression Inventory (CDI). This instrument is composed of 27 items that evaluate depressive symptoms,

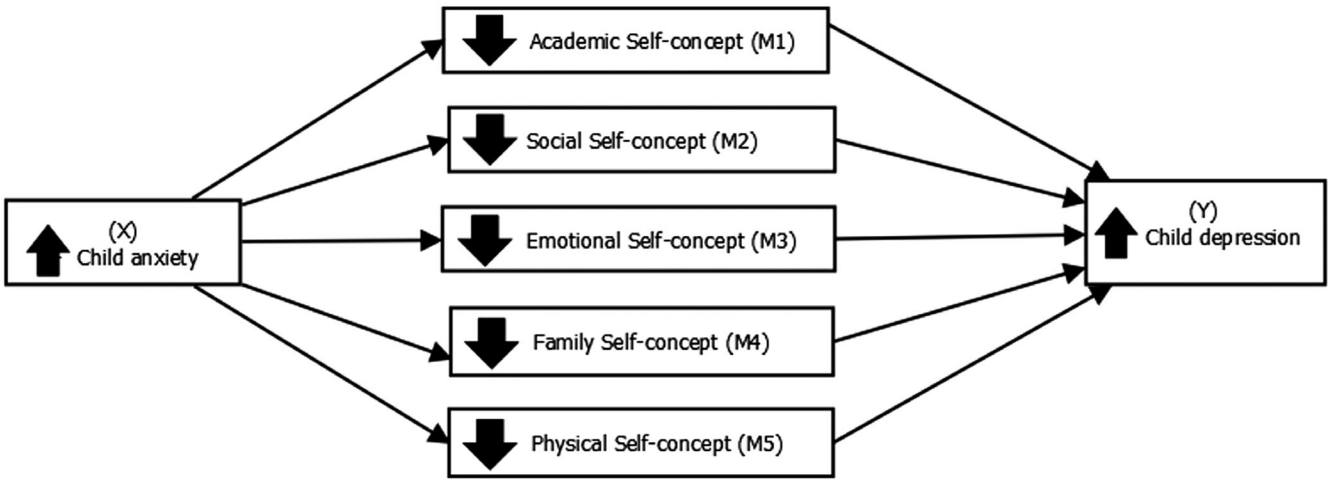

Figure 1. Expected mediation relationships

including depressed mood, interpersonal problems, low self-esteem, and anhedonia (Kovacs, 1992). The response format includes 0 (*absence of symptoms*), 1 (*mild or probable symptom*), and 2 (*definite symptom*), with a maximum score of 54. The psychometric properties in the Spanish population are good (Del Barrio & Carrasco, 2004), and the internal consistency in the present study was high (Omega $_{Hierarchical}$ = .82). This measure was applied at the three time-points.

Screen for Child Anxiety-Related Emotional Disorders (SCARED). This questionnaire consists of 41 items that evaluate general and specific anxiety symptoms (Separation anxiety disorder, Social anxiety, Panic, School anxiety, and Generalized anxiety disorder) (Birmaher et al., 1999). The 3-point Likert format includes 0 (*not true or hardly ever true*), 1 (*somewhat true or sometimes true*), or 2 (*very true or often true*), with a maximum score of 82. The total score is obtained by summing the scores for each subscale, and higher scores denote more severe symptoms. The internal consistency for the total SCARED score obtained in this study was high (Omega $_{Hierarchical}$ = .86). The Spanish version of the SCARED (Vigil-Colet et al., 2009) was applied at all three time-points.

Potential mediators

Five-factor self-concept questionnaire (AF-5). This instrument consists of 30 items that assess self-concept in five areas (Family, Emotional, Physical, Social, and Academic), each area containing 6 items (García & Musitu, 1999). In its original version, the response scale ranges from 1 to 99. However, in the present study, it was presented on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) to facilitate the completion and understanding of the questionnaire. The scores range between 6 and 30 points. The AF-5 was developed, validated, and standardized in Spain. The internal consistency of the subscales was as follows: Academic (α = .88), Social (α = .75), Emotional (α = .73), Family (α = .74), and Physical (α = .76), with a maximum score of 30 for each subscale. The AF-5 was administered at Times 1 and 2.

Statistical analysis

All analyses were performed with SPSS 25. Sociodemographic variables were explored using descriptive statistics. We calculated mean, standard deviation (SD), ranges, and Pearson correlations for continuous variables. Correlation coefficients were interpreted according to Cohen's (1988) guidelines. Omega Hierarchical correlation for reliability was calculated using *R* Studio (R Studio, 2016) interface for *R* version 3.5.2 (R Core Team, 2017) for ordinal variables (CDI and SCARED). Cronbach's alpha was run for the AF-5 (self-efficacy) because of the continuous nature of this measure. Because of the longitudinal nature of the current study, attrition analyses were run to identify the equivalence between children who were involved in the study and completed all three evaluations, and those who dropped out at Time 2 or 3.

The macro PROCESS v3 for SPSS was used for mediation analyses (Hayes, 2013; Preacher & Hayes, 2008). Preacher and Hayes' approach (Preacher & Hayes, 2008) to mediation analysis is an easy, intuitive, and reliable method to achieve the objectives proposed in this study. The inference about the statistics is based on bootstrapping methods, given that many of these statistics have irregular sampling distribution, making inference with ordinary methods problematic (Hayes, 2013). According to Hayes, Montoya, and Rockwood (2017), for models of observed variables (as in this case), it generally makes no difference which is used (PROCESS or SEM), as the results will be substantively identical.

In a first step, the model included a predictor (anxiety at Time 1), potential mediators – self-concept (Academic, Social, Emotional, Family, and Physical) at Time 2 – and the main outcome (depression at Time 3). In a second step, children's age and sex, self-concept areas (Time 1), anxiety (at Times 2 and 3), and depression (at Times 1 and 2) were controlled. Figure 2 shows the conceptual diagram of this model. Asymmetric Confidence Interval was based on the bootstrap method with 5000 replicates, and the significant criterion was $p \leq .05$. The α-path shows the relationship between anxiety (predictor evaluated at Time 1) and the self-concept subscales (potential mediators evaluated at Time 2). The β-path shows the relationship between each self-concept subscale and depressive symptomatology (main outcome evaluated at Time 3). An effect was considered statistically significant if zero was not included in the confidence interval. Raw data can be consulted in https://doi.org/10.6084/m9.figshare.14414225

Results

Sample characteristics

At Time 1, participants were 217 children (48.8% girls) aged 8–12 years (M = 9.87, SD = 1.20), who belonged to families of medium socioeconomic level. The age distribution was as follows: 8 (n = 34; 15.7%), 9 (n = 52; 24%), 10 (n = 57; 26.3%), 11 (n = 56; 25.8%), and 12 years (n = 18; 8.3%). Regarding the academic grade, the participants were studying: 3rd grade (n = 57; 26.3%), 4th grade (n = 54; 24.9%), 5th (n = 60; 27.6%), and 6th grade (n = 46; 21.2%). All participants were Spanish and had an average of 1.31 siblings (SD = 0.80).

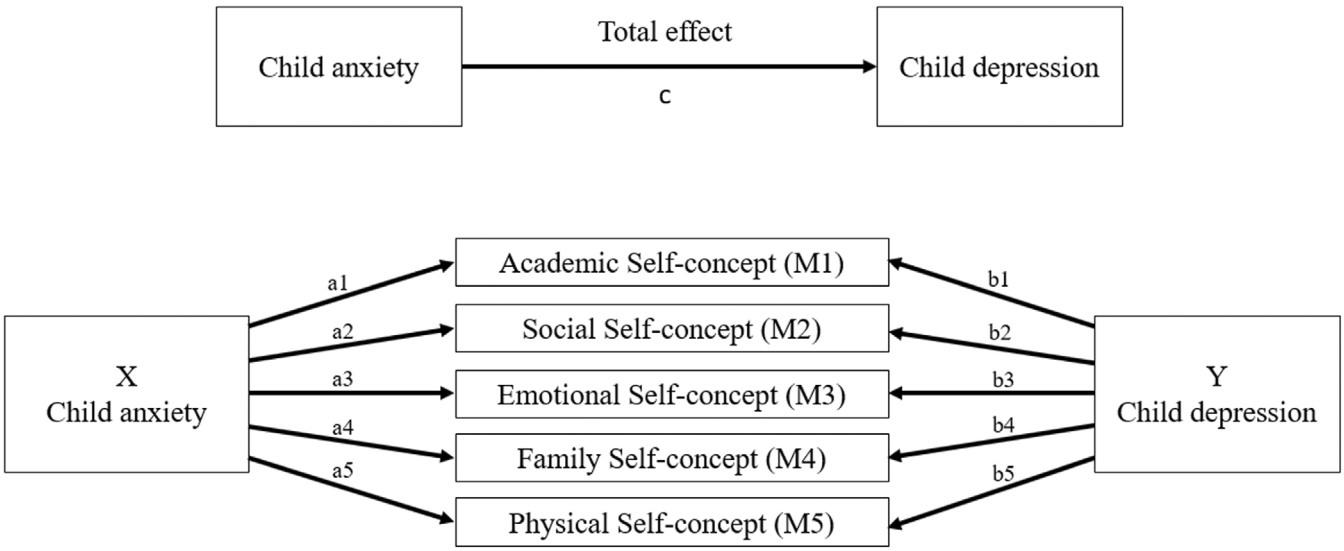

Figure 2. Schematic of the mediation analyses

Preliminary analyses

Table 1 presents the results for descriptive (mean, *SD*, and ranges) and correlation analyses for the predictor anxiety (total score of the SCARED), potential mediators – self-concept (Academic, Social, Emotional, Family, and Physical; all subscales of the AF-5), and main outcome (total score of the CDI), and continuos covariates (children's age, self-concept measures at Time 1), anxiety (Times 2 and 3) and depression (Times 1 and 2).

The levels of depression and anxiety across times were low, which was expected, as this is a nonclinical sample. However, the level of self-efficacy ranged from moderate (e.g., Emotional self-concept) to high (e.g., Family self-concept).

Anxiety (predictor) was indirectly related to self-concept measures (Academic, Social, Emotional, Family, and Physical) at Times 1 and 2. This indicated that children who reported a higher level of anxiety were more likely to present lower scores on the self-concept subscales. Correlation coefficients between anxiety and self-concept ranged from low (−.20 for Family self-concept at Time 1) to moderate (−.52 for Academic self-concept at Time 2). Anxiety (predictor at Time 1) was directly related to depression (at Time 3) and anxiety measures (at Times 2 and 3), and these relationships ranged from moderate (−.38 for depression at Time 3) to large (−.73 for anxiety at Time 2). Therefore, children who reported a higher level of anxiety were more likely to present a higher level of depression and anxiety across time, as expected.

The self-concept subscales (Academic, Social, Emotional, Family, and Physical) were directly correlated with each other. Coefficients ranged from low (.12 for the relationship between the Emotional and Physical self-concept subscales) to high (.49 for the relationship between the Academic and Family self-concept subscales). Indirect and significant relationships were found between the self-concept subscales and depression, which suggests that children who reported higher scores in self-concept areas at Time 2 were more likely to present a lower level of depression at Time 3. Correlation coefficients ranged from low (−.25 for Social self-concept) to high (−.61 for Family self-concept).

Children's age was unrelated to anxiety at Time 1 (predictor) and depression at Time 3 (main outcome). Older children were more likely to report higher scores of Social, Family, and Physical self-concept areas at Time 2, although these relationships were moderate. Significant correlation coefficients ranged from low (−.14 for Physical self-concept) to high (−.19 for Social self-concept).

Mediation

Table 2 shows the indirect effects of anxiety (Time 1) on 12 months from the baseline assessment depressive symptomatology (Time 3), as mediated by five areas of self-concept (Academic, Social, Emotional, Family, and Physical) (Time 2) without controlling (Step 1) and controlling (Step 2) for children's age and sex, self-concept measures at Time 1, depression at Times 1 and 2, and anxiety at Times 2 and 3.

Step 1. In the first step, all self-concept areas, except for Social self-concept, were statistically significant mediators between anxiety (X) and depression (Y). children who reported scores in anxiety (Time 1) were more likely to report a higher level of depressive symptoms at the 12 months from the baseline assessment (Time 3), suggesting that this result may be indirectly associated with a lower self-concept in the academic, emotional, family, and physical self-concept areas (Time 2).

On the α-paths, significant and indirect relationships were found between anxiety (Time 1) and all self-concept areas (Time 2). These relationships ranged from low (anxiety/Physical self-concept) to moderate (anxiety/Academic self-concept). Thus, children who reported higher level of anxiety (Time 1) were more likely to report lower scores in all self-concept areas (Time 2). On the β-paths, significant and indirect relationships were found between self-concept areas (Academic, Emotional, Family, and Physical) (Time 2), and depressive symptoms at the 12 months from the baseline assessment (Time 3). These relationships ranged from low (Social self-concept/depression) to moderate (Academic self-concept/depression). This suggests that children who

Table 1. Correlations, mean values, *SD*s, and range of scores for all variables of interest

Variable	*M*	*SD*	Range	Depression (Time 3)	Anxiety (Time 1)	Academic SC (M1)	Social SC (M2)	Emotional SC (M3)	Family SC (M4)	Physical SC (M5)
Main outcome										
Depression (Time 3)	7.82	5.38	0–29							
Predictor										
Anxiety (Time 1)	24.49	9.90	0–72	.38** [.25, .49]						
Mediators (Time 2)										
Academic SC (M1)	22.93	6.68	6–30	−.51** [−.60, −.40]	−.52** [−.61, −.41]					
Social SC (M2)	24.42	4.23	6–30	−.25** [−.37, −.12]	−.35** [−.47, −.23]	.25** [.12, .37]				
Emotional SC (M3)	19.48	5.85	6–30	−.36** [−.47, −.24]	−.48** [−.58, −.37]	.37** [.25, .48]	.23** [.10, .36]			
Family SC (M4)	26.76	4.67	6–30	−.61** [−.69, −.52]	−.40** [−.50, −.28]	.49** [.38, .58]	.21** [.08, .34]	.37** [.25, .49]		
Physical SC (M5)	23.76	4.33	6–30	−.35** [−.46, −.22]	−.29** [−.41, −.17]	.41** [.29, .51]	.41** [.30, .52]	.12 [−.02, .25]	.31** [.19, .43]	
Covariates										
Age	9.87	1.20	8–12	.02 [−.12, .15]	−.12 [−.25, .01]	.10 [−.03, .23]	.19** [.05, .31]	.11 [−.02, .24]	.17* [.03, .30]	.14* [.00, .27]
Academic SC (Time 1)	24.12	4.58	6–30	−.32** [−.44, −.20]	−.24** [−.36, −.11]	.56** [.45, .64]	.26** [.13, .38]	.14* [.00, .27]	.33** [.21, .45]	.45** [.34, .55]
Social SC (Time 1)	23.86	4.27	6–30	−.25** [−.37, −.12]	−.29** [−.40, −.16]	.26** [.13, .38]	.62** [.53, .70]	.15* [.01, .28]	.24** [.11, .36]	.41** [.29, .52]
Emotional SC (Time 1)	19.78	4.52	6–30	−.24** [−.36, −.11]	−.40** [−.50, −.28]	.17* [.04, .30]	.14* [.00, .27]	.41** [.29, .52]	.16* [.03, .29]	.10 [−.03, .24]
Family SC (Time 1)	27.05	3.76	6–30	−.28** [−.40, −.16]	−.20** [−.32, −.07]	.26** [.13, .38]	.20** [.06, .32]	.09 [−.05, .22]	.41** [.29, .51]	.32** [.19, .43]
Physical SC (Time 1)	22.84	4.66	6–30	−.33** [−.45, −.21]	−.28** [−.40, −.15]	.40** [.28, .51]	.32** [.19, .44]	.11 [−.03, .24]	.38** [.26, .49]	.68** [.60, .74]
Depression (Time 1)	8.97	5.81	0–29	.58** [.49, .67]	.57** [.47, .65]	−.62** [−.69, −.52]	−.42** [−.52, −.30]	−.42** [−.52, −.30]	−.46** [−.56, −.34]	−.52** [−.61, −.42]
Depression (Time 2)	7.59	5.69	0–29	.58** [.49, .67]	.46** [.35, .56]	−.57** [−.65, −.47]	−.47** [−.57, −.36]	−.49** [−.58, −.38]	−.44** [−.54, −.33]	−.50** [−.60, −.39]
Anxiety (Time 2)	22.14	10.08	0–72	.45** [.33, .55]	.73** [.66, .78]	−.45** [−.55, −.33]	−.36** [−.47, −.23]	−.54** [−.63, −.43]	−.36** [−.47, −.24]	−.29** [−.41, −.16]
Anxiety (Time 3)	22.10	8.92	0–72	.64** [.56, .72]	.55** [.45, .64]	−.39** [−.50, −.26]	−.25** [−.37, −.11]	−.42** [−.52, −.30]	−.44** [−.54, −.32]	−.20** [−.33, −.07]

M and *SD* are used to represent mean and standard deviation, respectively. SC, Self-concept. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). *$p < .05$. **$p < .01$.

Table 2. Assessing self-concept as a mediator between anxiety and long-term depressive symptomatology

Potential mediator	Effect of the anxiety on the potential mediator			Effect of the potential mediator on depressive symptomatology at 12 months from the baseline assessment			Indirect effect of the potential mediator on depressive symptomatology at 12 months from the baseline assessment
	α-Path[a] (*SE*)	95% CI	*p* value	β-Path[b] (*SE*)	95% CI	*p* value	Ind1[c, d]
Step 1							
Academic SC (M1)	−.34 (.04)	−.42, −.26	**≤.001**	−.33 (.05)	−.44, −.22	**≤.001**	**.11 (.02) [.06, .17]**
Social SC (M2)	−.14 (.02)	−.20, −.09	**≤.001**	−.16 (.08)	−.33, .01	.06	.02 (.01) [−.004, .05]
Emotional SC (M3)	−.29 (.03)	−.36, −.22	**≤.001**	−.20 (.06)	−.33, −.07	**.002**	**.05 (.02) [.01, .10]**
Family SC (M4)	−.18 (.03)	−.24, −.13	**≤.001**	−.61 (.06)	−.75, −.48	**≤.001**	**.11 (.02) [.06, .17]**
Physical SC (M5)	−.12 (.02)	−.18, −.06	**≤.001**	−.31 (.08)	−.47, −.15	**.001**	**.03 (.01) [.01, .07]**
Step 2							
Academic SC (M1)[e]	−.15 (.05)	−.26, −.04	**.006**	−.12 (.05)	−.22, −.01	**.02**	**.02 (.01) [.0003, .04]**
Social SC (M2)[e]	−.04 (.03)	−.11, .02	.19	.06 (.08)	−.09, .22	.41	−.003 (.006) [−.01, .007]
Emotional SC (M3)[e]	−.07 (.05)	−.18, −.03	.17	−.004 (.05)	−.10, .10	.92	.004 (.007) [−.01, .01]
Family SC (M4)[e]	−.06 (.04)	−.15, .01	.12	−.37 (.06)	−.49, −.25	**≤.001**	.02 (.01) [−.007, .06]
Physical SC (M5)[e]	−.002 (.03)	−.06, .07	.94	−.03 (.08)	−.20, .12	.64	−.0001 (.004) [−.01, .008]

SC, self-concept.
Bold values indicate that $p<.05$.
[a]The α-path is the anxiety effect on each potential mediator.
[b]The β-path is the effect of the potential mediator on depressive symptomatology at the 12-month follow-up.
[c]Ind 1 = X − M1 − Y.
[d]Asymmetric Confidence Interval based on Bootstrap method with 5000 replicates.
[e]Step 2 = The mediation analyses were adjusted for children's sex and, age, baseline value of the mediator, anxiety (at Times 2 and 3), and depression (at Times 1 and 2).

reported lower scores in these self-concept areas (Time 2) were more likely to present higher levels of depressive symptoms at the 12 months from the baseline assessment (Time 3).

Step 2. In the second step, children's age and sex, self-concept areas (Time 1), depression (Times 1 and 2), and anxiety (Times 2 and 3) were included in the model (Table 2). Results indicated that only academic self-concept was a significant mediator between anxiety (X) and depression (Y). Children who reported higher scores in anxiety (Time 1) were more likely to report a higher level of depressive symptoms at the 12 months from the baseline assessment (Time 3), suggesting that this result may be indirectly associated with a lower Academic self-concept (Time 2).

On the α-paths, a significant and indirect relationship was found between anxiety (Time 1) and Academic self-concept (Time 2), indicating that children who reported higher anxiety (Time 1) are more likely to present lower level of Academic self-concept (Time 2). Five of the eight covariates were significant: sex (β = 1.49; *SE* = .67; 95% CI [0.16, 2.81], $p < .05$), academic self-concept at Time 1 (β = .47; *SE* = .08; 95% CI [0.30, 0.64], $p < .001$), depression at Time 1 (β = −.22; *SE* = .08; 95% CI [−0.40, −0.05], $p < .05$), depression at Time 2 (β = −.19; *SE* = .09; 95% CI [−0.38, −0.0008], $p < .05$), and anxiety at Time 1 (β = −.15; *SE* = .05; 95% CI [−0.26, −0.04], $p < .01$). No significant relationship was found between anxiety and the rest of self-concept areas.

Based on the β-paths, children who reported lower self-concept in the academic and family areas at Time 2 were more likely to present a higher level of depressive symptoms at Time 3. Covariates were not significant in path β, except for depression at Time 1 (β = .30; *SE* = .07; 95% CI [0.15, 0.45], $p < .001$), depression at Time 2 (β = .26; *SE* = .07; 95% CI [0.11, 0.41], $p = .004$), and anxiety at Time 3 (β = .33; *SE* = .03; 95% CI [0.26, 0.41], $p < .001$).

Discussion

The objective of this study was to understand the mechanisms through which the early presence of anxiety symptoms is associated with the subsequent development of depression. Specifically, it was hypothesized that children's self-perception in the academic, social, emotional, family, and physical areas could mediate this relationship. The results showed that children who reported anxiety symptoms presented a lower self-concept in all areas. However, only a low Academic self-concept mediated the relation between the early presence of anxiety symptoms and the subsequent development of depression.

The preliminary analyses carried out revealed a direct relationship between early anxiety symptoms and later development of depressive symptoms. These results are consistent with previous studies (e.g., Craske & Zucker, 2001; Garber & Weersing, 2010). In this sense, the Spanish children who manifest early anxiety symptoms were more likely to develop depressive symptoms 12 months later. Essau et al. (2014) confirmed the high comorbidity between the two internalizing disorders, the chronicity that characterizes them, and their possible continuity over time.

Similarly, it was observed that a high self-concept (academic, social, emotional, family, and physical) was related to fewer internalizing symptoms, and inversely, in line with the results supported by Bernaras et al. (2018) and Spilt et al. (2014). In cognitive vulnerability models aimed at understanding the risk factors involved in the onset and maintenance of anxiety and depression, low self-concept plays a notable role (Van Tuijl et al., 2014). Specifically, it was found that children who reported early anxiety symptoms showed a lower self-concept in all areas (Academic, Social, Emotional, Family, and Physical). Although the relationship between anxiety and low self-concept seems clear, confirming empirically these results is important to reduce the gap in the literature (Goetz et al., 2010). On another hand, children who showed a low Academic, Emotional, Family, and Physical self-concept were more likely to present future depressive symptoms. A surprising finding of the present study is that a low social self-concept was not related to the development of depressive symptoms. A possible explanation could be that the social environment is more important in adolescence than in childhood, given that in adolescence, the peer group becomes an indispensable agent for the development of the self-concept and identity (Ragelienė, 2016). However, further research with adolescents is necessary to draw conclusions.

Regarding the self-concept subscales, the highest correlation was found between Family and Academic self-concept and between Physical and Academic self-concept. In other words, children who feel competent to achieve goals in the school environment often have a positive perception of their family involvement, as well as perceiving their physical appearance and sport condition positively. Also, the lowest correlation was found between Physical and Emotional self-concept, so it seems that a positive physical and sports perception is not related to greater emotional control in specific situations.

To obtain more accurate results, depression scores at Times 1 and 2 and anxiety scores at Times 2 and 3 were controlled. Once these covariates were controlled, the mediation analyses revealed that only the academic area of self-concept played a mediating role between the development of anxiety symptoms and the manifestation of depressive symptoms 1 year later. Children who showed anxiety symptoms at the pretest evaluation developed more depressive symptoms 1 year later if they did not feel competent to carry out school activities or to achieve objectives in the school environment. In line with this finding, Goetz et al. (2010) highlighted that encouraging a positive Academic self-concept in children could decrease the presence of negative emotions such as anxiety. These results are especially important, as children aged 8–12 begin to more consciously examine their skills in different areas. It seems essential for children of these ages to feel competent in the school setting. Teaching children or encouraging them to attribute their academic achievement to personal and controllable variables could be a strategy to achieve this goal (Goetz et al., 2010). In short, our results suggest that of all the areas of self-concept evaluated, the one that refers to academic competence is the one that is most closely related to internalizing symptoms in children. The school is one of the settings where children spend most

of their time, and therefore, their perception of themselves in this context may be one of the most important ones in their self-assessment as a person. Moreover, academic self-concept may also influence family and social self-concept. This means that the assessment that children receive from their parents or their friends may also be conditioned by their academic results. For example: "If I get good grades, more classmates or friends will want us to sit together in class or meet in the afternoon to do homework and play" or "If I get good grades, my parents will congratulate me and be happier". These are some hypotheses, but more evidence is required of the influence of academic self-concept on children's mental health.

Conclusions

Despite the above findings, this study presents some limitations. First, although the study of self-concept is essential, other important factors that can influence the relationship between anxiety and depression have not been taken into account. Second, because of the follow-ups, the final sample was not so large, which may compromise the generalization of the results. On another hand, participation in the study included children from the general population, and we do not know whether these findings are to be expected in diagnosed clinical samples. Moreover, as self-reports were used, the information was only collected from the children. The timing of assessments may have impacted findings. The children were evaluated after the second trimester of the academic year (after two evaluations carried out in the school setting) (Time 1); Time 2 was obtained before summer (at the end of the academic year) and Time 3 was carried out after 12 months of the baseline evaluation. The academic results obtained during the academic year, the family and social experiences lived up to the timing of assessments may have influenced the child perception of self-concept and anxious and depressive symptomatology. Future studies should also include parental reports and clinical interviews in order to obtain independent verification of symptoms. Finally, the approach of this study does not allow us to identify possible differences according to gender.

However, this study also has some strengths. First, this is a longitudinal study, which allows establishing relations between variables. Second, taking into account the high comorbidity between the two disorders (e.g. Essau et al., 2014), the control of anxiety and depression levels at different times of measurement has allowed accurate conclusions to be drawn derived from mediation analyses. Moreover, few studies have analyzed how risk factors relate to symptoms of depression and anxiety in young children (Hopkins, Lavigne, Gouze, Lebailly, & Bryant, 2013).

The empirical results obtained in the present study confirm that the early onset of anxiety symptoms may lead to the future development of depressive symptoms in Spanish children. Future longitudinal studies could be directed to examine different risk and protective factors, considering relationships of a different nature (direct and indirect) and even analyzing possible differences by age between samples of young and older children (Wu & Kuo, 2015). Furthermore, as a main conclusion, a low Academic self-concept is one of the variables related to the development of depressive symptoms, so improving Academic self-concept in children who reported anxiety symptoms could prevent long-term depressive symptoms. The implementation of programs aimed at reducing anxiety problems should include activities to increase children's self-concept. The need and effectiveness of involving the parents in the process and the inclusion of strategies to reduce parental anxiety should also be examined (Fisak et al., 2011). The relationships found between anxiety and depression and the multitude of variables involved in childhood psychopathology suggest the need to address childhood anxiety problems from a transdiagnostic approach.

This study represents a small advance in the identification of the specific areas of self-concept that seem to influence the maintenance and chronicity of these internalizing symptoms. Strategies aimed at improving the academic self-concept of children, especially those with early symptoms of anxiety, could prevent the future onset of depression and, consequently, reduce the cost in the health system (Stengård & Appelqvist-Schmidlechner, 2010). Successful early treatment of anxiety symptoms in childhood may be a cost-effective way to prevent future depressive problems (Garber & Weersing, 2010).

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Ethical information

The Ethics Committee of Miguel Hernández University approved this study (DPS.MO.02.14).

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Appendix S1. CODEBOOK (variables).

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