

# **THE RELATIONSHIP BETWEEN PRESCHOOL CHILDREN'S ANXIETY AND LIFE SKILLS: THE MEDIATING ROLE OF SELF-REGULATION**

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## **ABSTRACT**

The present study examined the mediating role of self-regulation in the relationship between preschool children's anxiety and life skills. Children's anxiety, self-regulation, and life skills were assessed using the "Children's Anxiety Scale-Mothers' Form," "The Self-Regulation Skills Scale for Children aged 4 to 6 (Mothers' Form)," "The Early Childhood Life Skills Scale," and the data obtained from 303 participants who participated in the survey were tested through PLS to SEM. Although preschool children's anxiety is not directly related to life skills, self-regulation fully mediates the relationship between anxiety and life skills. The results provided preliminary evidence for the mechanism by which children's anxiety affects self-regulation and life skills. These findings suggest that the relationship between anxiety and life skills varies according to children's self-regulatory abilities. The findings have practical implications for supporting the development of self-regulation in preschool children.

**Keywords:** Anxiety, self-regulation, life skills, preschool children

## **INTRODUCTION**

Self-regulation, which is the ability to manage emotions, behaviors, and cognitions according to social demands, is among the most important achievements in child development that allow children to avoid risky behaviors and lead a happy and successful life (Boyd et al., 2005; Denham et al., 2014). In this respect, self-regulation is critical for children to develop a healthy personality as well as developmental outcomes such as social competencies, adaptive behaviors, and early academic success (Bell & Deater-Deckard, 2007; Kim et al., 2013; von Suchodoletz et al., 2009; Rademacher et al., 2022).

The development of children's self-regulation skills during the preschool period has a significant impact on their problem-solving abilities and emotional management, thereby enhancing their self-confidence (Schunk & Zimmerman, 2001). Children who possess effective self-control and management skills tend to have higher levels of self-confidence compared to their peers. They also exhibit greater academic success due to their utilization of self-regulation skills in various academic tasks such as listening to the teacher, adhering to rules, following instructions, engaging with peers, and completing learning tasks (McClelland & Tominey,

2011; McClelland et al., 2014). Children with well-developed self-regulation skills demonstrate proficiency in managing their emotions, behaviors, and attention (Morosanova & Fomina, 2017; Sepitçi-Sarıbaşı & Gültekin-Akduman, 2019). Notably, while positive emotions facilitate self-regulation, negative emotions may hinder it (Zelazo et al., 2016). Conversely, a lack of self-regulation can lead to maladaptive behaviors, a lack of self-control, aggression, and anxiety, which may have long-term implications. Research suggests that children with poor self-regulation skills are more likely to experience exclusion by their peers, exhibit poor academic achievement (Eisenberg et al., 2001; McClelland & Tominey, 2011), engage in problem behavior (Montroy et al., 2014), and face challenges such as substance addiction, criminal behavior, and difficulties in social relationships later in life (Hrbackova & Safrankova, 2016).

Children with high self-regulation skills demonstrate the ability to anticipate factors that may trigger fear, anxiety and stress and effectively reduce the negative impact of these emotions. Insufficient development of self-regulation skills in children can result in difficulties in establishing and maintaining relationships, which may lead to challenges such as peer rejection. Additionally, children with anxiety symptoms struggle with self-regulation (Quiñones-Camacho & Davis, 2019). For instance, Suveg et al. (2009) observed that anxious children had difficulty dealing with emotions as they had more irregular emotional expressions. It is also highly possible that they have trouble regulating attention as a component of self-regulation. Eisenberg et al. (2001) observed that children with internalizing disorders displayed low attention regulation. Briefly, children with high self-regulation skills are seen to be more successful in controlling their emotions than their peers and better at managing the risks of depression and anxiety (Alvord & Grados, 2005).

Behavior problems are often referred to as internalizing and externalizing, and externalizing problems generally include acting out behaviors like aggression and objection, whereas internalization problems include depression, anxiety, and somatic symptoms (Achenbach & Rescorla, 2000). Anxiety, one of the internalizing problems, is one of the most common types of psychopathology observed in childhood (Gülay-Ogelman & Önder, 2020). Studies have shown that social anxiety, separation anxiety, specific phobia and generalized anxiety are common disorders among young children (Edwards et al., 2010). These problems can have a lasting impact, affecting both the early childhood period itself and extending into adulthood (Durmuşoğlu-Saltalı & Arslan, 2012; Lavigne et al., 2015; Thompson, 2001; Wu & Lee, 2020). Previous research has shown that children's anxiety is negatively correlated with their social skills and feelings of confidence (Shamir-Essakow et al., 2005; Doğanay-Koç & Gültekin-Akduman, 2017; Küçüköyük, 2015). For instance, Holland et al. (2017) reported that children with anxiety problems displayed lower levels of confidence. Untreated childhood anxiety can lead to various challenges, such as antisocial behavior, social anxiety, and substance use (Angold & Egger, 2007; Wild et al., 2004). Furthermore, anxiety can significantly affect a child's social and academic life in the future (Bellibaşı et al., 2005; Ollendick & Hirshfeld-Becker, 2002; Thapar et al., 2012; Williams & Woodruff-Borden, 2015), potentially leading to academic failure and difficulties adjusting to school (Ladd & Burgess, 2001).

In the last two decades, prevention approaches targeting internalizing and externalizing problems have increasingly emphasized the significance of developing motivation and social-emotional competence in children (Botvin & Griffin, 2014; Huber et al., 2019). The World Health Organization (1997) has advocated life skills education to promote social and emotional development and thereby prevent health and social problems. They recommend ten core life

skills, including (1) problem-solving, (2) coping with stress, (3) creative thinking, (4) empathy, (5) coping with emotions, (6) decision-making, (7) critical thinking, (8) interpersonal relationships, (9) effective communication, and (10) self-awareness. The United Nations Children's Fund defines life skills as a comprehensive set of psychosocial and interpersonal abilities that facilitate conscious decision-making, effective communication, coping and self-awareness development, and contribute to leading a healthy and productive life (Hodge et al., 2013; UNICEF, 2019).

Life skills enable children to realize their own and others' worth, make the right decisions, solve problems related to emotions and stress (Bastık, 2018), and increase their self-regulation and self-confidence (Chupradit et al., 2020). By supporting mental well-being of individuals, life skills prevent mental disorders, health problems, and behavioral problems (Shechtman et al., 2005). Socially anxious children may have difficulty managing their emotions or performing effectively in challenging social situations (Hannesdottir & Ollendick, 2007). Like self-regulation, social skills acquired at an early age enhance children's social and academic performance (Amirian, 2012) and help them cope with challenges. Some longitudinal studies even show the long-term effects of life skills. For instance, it is known that life skills gained in childhood are effective for being physically and mentally healthy in adulthood, reducing mental disorders such as depression and stress (Goodman et al., 2015; Moffitt et al., 2011), and are directly proportional to positive classroom behavior and academic achievement (UNICEF, 2019). Similarly, it has been reported that the level of life skills is significantly correlated with emotional well-being (Chandra, 2018; Demirci & Ümmet, 2017; Yadavari, 2004) and that the level of life skills is effective in reducing anxiety (Rahmani, 2019) and developing children's social skills and adjustment levels (Göktürk-İnce, 2014; Topcu-Bilir & Erkan, 2022; Tymes et al., 2016; Yıldırım, 2017).

## **The Current Study**

Despite the existing body of literature examining the relationships among anxiety, self-regulation, and life skills in preschool children, there remains a notable research gap regarding the comprehensive investigation of these variables simultaneously. Previous studies have shown that anxious behaviors exhibited by preschool children significantly influence their self-regulation skills, which are essential for managing behavior, emotions, and attention. Conversely, high levels of anxiety have been found negatively impact self-regulation (Buckner et al., 2003; Quiñones-Camacho & Davis, 2019). Furthermore, empirical findings suggest that improved self-regulation positively contributes to the development of life skills in children (Chandra, 2018; Yadavari, 2004).

While previous studies have extensively explored the various dimensions of self-regulation, there is an urgent need to examine its role in supporting the acquisition of daily life skills in early childhood and to identify the detrimental effects of childhood anxiety on this relationship. By addressing this research gap, professionals in the field, educators, and other stakeholders can gain a deeper understanding of the importance of fostering children's life skills and facilitating early interventions for childhood anxiety. By examining these relationships, the present study contributes to the existing literature by shedding light on the developmental processes involving anxiety, self-regulation, and life skills during early childhood.

The primary purpose of this study was to examine the mediating effect of self-regulation on

the relationship between anxiety and children's life skills in preschool children.

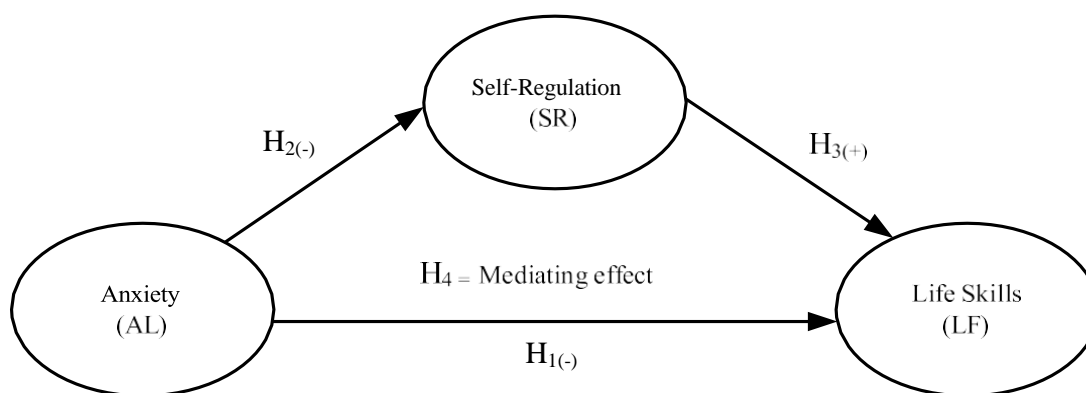
Specifically, the study aimed to determine whether anxiety serves as a predictor of life skills in this particular sample. It was hypothesized that the positive influence of self-regulation on life skills would moderate the negative effects of anxiety. In addition, a robust relationship between anxiety and self-regulation was expected. The research hypotheses and theoretical model are visually depicted in Figure 1 below:

Hypothesis 1. Anxiety has a direct effect on life skills.

Hypothesis 2. Anxiety has a direct effect on self-regulation.

Hypothesis 3. Self-regulation has a direct effect on life skills.

Hypothesis 4. Self-regulation mediates the relationship between anxiety and life skills.



*Figure 1. Theoretical model of the research*

## **METHODOLOGY**

### **Participants**

The participants consisted of 303 children (141 girls, 162 boys) attending preschool in a city center in Turkey. The children were 48-72 months; 26.42% were 48-60 months old, and 73.6% were 61-72 months old. The time that the children had been receiving preschool education was three years for 16.5% and one year for 43.62% of them. As for parents' educational background, 24.4% of the mothers ( $M_{age}= 33.24$ ,  $SD= 6.15$ ) were high school graduates, and 50.5% were university graduates, while 29.4% of the fathers ( $M_{age}= 37.4$ ,  $SD= 5.27$ ) were high school graduates and 43.9% were university graduates.

### **Procedure**

This study obtained ethical approval from the Ethics Committee of Burdur Mehmet Akif Ersoy University (Approval No. GO2023/341). The informed consent form was obtained from the mothers of the children. Data collection was conducted between November and August 2022. Children's anxiety, self-regulation and life skills were evaluated over their mothers' ratings. The data set had no missing values.

## Data Collection Tools

### *Anxiety*

Children's anxiety levels were measured using the SCAS - Spence Children's Anxiety Scale - Mothers' Form developed by Spence et al. (2001). The scale scores were obtained according to parents' opinions. It consists of 28 items and five sub-scales. The items are conceptualized as generalized anxiety, social phobias, separation anxiety, fears of physical injury and obsessive-compulsive disorders. SCAS has previously been proven to be valid and to have good psychometric properties on a sample consisting of young children in Turkey (Güngör & Buluş, 2016). As the findings from the analyses comply with Lord's (1980; cited by Gelbal, 1994) criteria of one-dimensionality, the scale was accepted as one-dimensional (Güngör & Buluş, 2016; Spence et al, 2001). The score interval of the scale is 28-140. Cronbach's Alpha value of the scale was found as 0.89 in the present study.

### *Self-regulation skills*

The Self-Regulation Skills Scale for Children aged 4-6 (Mothers' Form) is an instrument intended to determine the self-regulation skills of 4-6-year-old children based on parents' opinions. For the scale's construct validity, synchronous criterion validity, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed. EFA results indicate that the scale consists of 20 items and four factors, with 61% of the total variance explained. The factors are titled as attention, working memory, inhibitory control-emotion and inhibitory control-behavior. As a result of the CFA, it was found that the fit indices of the obtained structure were at a sufficient level ( $\chi^2/sd=1.91$ ,  $RMSEA=.07$ ,  $SRMR=.07$ ). The total item correlations of the scale range between .36 and .70. The Cronbach's Alpha coefficient of internal consistency was found as .90, synchronous validity as .84 and test-retest reliability as 0.77 (Erol & İvrendi, 2018). The Cronbach's Alpha value was calculated as 0.88 in the present study.

### *Life skills*

The mothers filled out the Early Childhood Life Skills Scale (ECLSS), developed by Topcu-Bilir and Erkan (2019), to measure children's life skills. The items on the scale include questions about health and safety skills added by the researcher as well as the 10 core life skills specified by the World Health Organization as communication, interpersonal relationship, critical thinking, creative thinking, problem-solving, decision making, management of emotions, coping with stress, self-awareness and empathy skills. CFA results showed that the fit indices of the obtained structure were at a significant level ( $\chi^2=7256.14$ ,  $\chi^2/sd= 4.89$ ,  $CFI=0.94$   $NNFI=0.92$   $NFI=0.91$   $RMSEA=0.06$  and  $GFI=0.90$ ). The scale consists of 56 items with scores ranging from 56 to 280. The scale is evaluated over total scores. It has been proven valid and reliable to use with Turkish children (Topcu-Bilir, 2022). The Cronbach's Alpha value was calculated as 0.92 in the present sample.

## Treatment of Common Method Bias

Common method bias (CMB) is a possible problem in research where data is collected via self-reported questionnaires (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003). According to Podsakoff et al. (2003), several methodological precautions should be taken and statistical controls be implemented to prevent potential CMS problems. In this regard, to eliminate the problem of CMB in the data collection process of the present study, scales that had been confirmed for validity and reliability by previous studies were employed. The data collection

instrument of the study was designed so as not to reflect the causal relationships between the research variables to the participants, and data were collected only from individuals who volunteered to participate in the study. Each participant was informed about the study, and no action was taken to manipulate the participants' responses (Podsakoff et al., 2003). In addition to these methodological precautions, the presence of any CMB problem was tested statistically with Herman's one-factor test (Podsakoff & Organ, 1986). All the manifest variables of the three scales included in the data collection explained 69.8% of the total variance with a multi-factor structure and 17.1% of the dominant factor in the structure. Since the resulting ratio was below the 40% threshold value, it was concluded that the data set was CMB-free (Fan et al., 2022).

### **Assessing the Assumption of Normality**

The data set was assessed for normal distribution to decide whether the research data were appropriate for parametric hypothesis testing. As it is recommended to determine the shape of distribution rather than predictive tests to examine the assumption of normal distribution in large sample studies (Tabachnick & Fidell, 2012), skewness and kurtosis values of the data were calculated in the present study. It was observed that the skewness values of the anxiety (AL), self-regulation (SR) and life skills (LS) variables ranged from -0.458 to 0.869, and kurtosis values ranged from 0.761 to 1.521. It was concluded that the normality assumption was met in the present study for the multiple variable data set based on the skewness coefficient smaller than three and the kurtosis coefficient smaller than 10 (Kline, 2015). The histogram graphs also showed no distinct deviation from the normal distribution in the data set. Based on these results, data analysis was initiated.

### **Data Analysis**

In the present study, which was conducted with the quantitative research method, data coding and analysis were performed on the SPSS software (v. 26). After testing potential CMB problems and the normality assumption, Cronbach's Alpha ( $\alpha$ ) coefficients were calculated to determine the reliability of the scales and the scales were found to have high internal consistency ( $\alpha_{KD} = 0.893$ ;  $\alpha_{OD} = 0.883$ ;  $\alpha_{YB} = 0.925$ ). Correlations among the research variables were examined before testing the hypotheses. Children's genders and preschool education times were included as potential control variables in the correlation analysis. The relationships between the control and research variables were interpreted with a t-test and ANOVA. Finally, the theoretical model of the study was analyzed using PROCESS macro (v. 4.2.), which was developed by Preacher and Hayes (2008) (available at: [www.afhayes.com](http://www.afhayes.com)) and is run in an integrated way with the SPSS software. The effect of the mediator variable SR in the theoretical model was interpreted using the bootstrap technique. The mediation hypothesis was accepted as significant when the lower (BootLLCI) and upper (BootULCI) bootstrap values of the mediation variable at a 95% confidence interval were either below or above zero (Zhao et al., 2010; Hayes, 2018).

## **RESULTS**

### **Correlation analysis**

Relationships among the variables were examined via correlation analysis prior to hypothesis testing. The control variables of the study, gender and preschool education time, were also included in the correlation analyses, and the results obtained are presented in Table 1. As seen in the table, Anxiety is negatively correlated with duration of education ( $r = -0.184, p < 0.01$ ), Self-Regulation ( $r = -0.212, p < 0.01$ ) and Life Skills ( $r = -0.189, p < 0.01$ ), and gender is negatively correlated with Self-Regulation ( $r = -0.126, p < 0.05$ ) and Life Skills ( $r = -0.169,$

$p < 0.01$ ). In addition, a positive relationship was observed between Self-Regulation and Life Skills ( $r = 0.764$ ,  $p < 0.01$ ). t-test and ANOVA were employed to interpret the correlations between the main variables of the study and the descriptive variables like gender and education time. In this respect, it was seen that children whose preschool education time was longer had lower Life Skills than those whose education time was shorter. The difference occurred between the children receiving three years of preschool education and those who attended preschool for one year ( $M_{\text{Difference}} = 7.600$ ). Moreover, girls were found to have higher Self-Regulation ( $M_{\text{Difference}} = 7.492$ ,  $p < 0.05$ ) and Life Skills ( $M_{\text{Difference}} = 2.530$ ,  $p < 0.05$ ) than boys. Based on this finding, it was concluded that gender could be considered a control variable in the study's theoretical model since significant correlations were found between the dependent variable and the mediator variable, contrary to duration of education.

Table 1

*Means, standard deviations and correlation coefficients (n = 303)*

Variable	M	SD	1	2	3	4	5
1. Gender	-	-	1				
2. Education	-	-	-0.003	1			
3. Anxiety Level(AL)	64.9	16.6	0.105	-0.184**	1		
4. Self-Regulation(SR)	77.1	9.9	-0.126*	0.069	-0.212**	1	
5. Life Skills (LS)	219.8	22.1	-0.169**	0.073	-0.189**	0.764**	1

Note: Gender was coded 0 = girl, 1 = boy; Duration of education was coded 0 = none, 1= one year, 2 = two years, 3= three years; AL = Anxiety Level; SR = Self-Regulation; LS = Life Skills; \*  $p < 0.05$ ; \*\*  $p < 0.01$ .

### Mediation analysis

The study's theoretical model was analyzed by applying Model 4 on the PROCESS macro software developed by Preacher and Hayes (2008) (Hayes, 2018). In the regression model built, Anxiety was defined as the independent variable, Self-Regulation as the mediating variable, Life Skills as the dependent variable and gender as the control variable. The findings obtained from the analysis are summarized in Table 2 and Table 3.

Table 2

*Regression analysis (direct effects)*

	R <sup>2</sup>	F	$\beta$	SE	t	p	LLCI   ULCI
[Step 1] Y = SR	0.067	10.806	-	-	-	< 0.05	-
Constant	-	-	90.647	2.972	30.495	< 0.05	84.797   96.497
AL(X)	-	-	-0.136	0.033	-4.058	< 0.05	-0.202   -0.070
Gender(C)	-	-	-3.006	1.121	-2.680	< 0.05	-5.213   -0.798
[Step 2] Y = LS	0.590	143.924	-	-	-	< 0.05	-
Constant	-	-	100.737	8.868	11.359	< 0.05	83.285   118.189
AL(X)	-	-	-0.052	0.050	-1.031	> 0.05	-0.152   0.047
SR(M)	-	-	1.656	0.085	19.477	< 0.05	1.489   1.824
Gender(C)	-	-	-3.483	1.672	-2.082	< 0.05	-6.774   -0.191

Note: AL = Anxiety Level; SR = Self-Regulation; LS = Life Skills; X: Independent variable, M: Mediating variable Y: Dependent variable, C = Control variable, SE: Standard error, LLCI: Lower

*continued*

limit of the bootstrap confidence interval with 95%, ULCI: Upper limit of the bootstrap confidence interval with 95%.

Table 2 presents the findings of the two regression models built for testing the hypothesis concerning the direct effects. In the first regression model, where self-regulation is the dependent variable (Step 1), the model is seen to be statistically significant ( $p < 0.05$ ), and the dependent variable is explained at a rate of 6.7%. In addition, when the effect of the gender variable is examined, it is seen that anxiety has a significant and negative effect on self-regulation ( $\beta = -0.136, p < 0.05$ ). In the second regression model, where life skill is the dependent variable (Step 2), it is seen that the model is statistically significant ( $p < 0.05$ ), and the dependent variable is explained at a ratio of 59%. Gender is included again as the control variable in Step 2, while it is seen that anxiety has no statistically significant effect on LS ( $\beta = -0.052, p > 0.05$ ). However, self-regulation affects life skills positively ( $\beta = 1.656, p < 0.05$ ). In this respect, it could be stated that H<sub>2</sub> and H<sub>3</sub> among the direct effect hypotheses of the study are supported, but H<sub>1</sub> is not supported.

Table 3  
*Total, direct and mediating effects*

	$\beta$	SE	LLCI   ULCI
Total effect	-0.278	0.074	-0.425   -0.132
Direct effect	-0.052	0.050	-0.152   0.047
Mediating effect	-0.226	0.066	-0.363   -0.103

Note: SE: Standard error, LLCI: Lower limit of the bootstrap confidence interval with 95%, ULCI: Upper limit of the bootstrap confidence interval with 95%.

Finally, to test H<sub>4</sub>, the mediating effect of self-regulation in the anxiety-life skills relationship was calculated, and the findings are presented in Table 3. As seen in the mediating effect path, anxiety had an indirect effect on life skills through self-regulation ( $\beta = -0.226$ , confidence intervals = -0.363 | -0.103). In addition, it was found that the total effect of anxiety on life skills was statistically significant and negative ( $\beta = -0.278$ , confidence intervals = -0.425 | -0.132); however, it did not affect life skills directly ( $\beta = -0.052$ , confidence intervals = -0.152 | 0.047). As a result, based on the mediation classification suggested by Zhao et al. (2010), self-regulation assumed the indirect-only mediation role in the relationship between anxiety and life skills in the present study. In other words, although anxiety does not directly affect life skills statistically, it has an indirect negative effect on life skills by weakening the effect of self-regulation on life skills. Then, it is possible to state that H<sub>4</sub> is supported.

## DISCUSSION AND IMPLICATIONS

The present study tested a conceptual model that examines the mediating role of self-regulation in the relationship between anxiety levels and life skills of children attending preschool education institutions in a city center in Turkey. The results revealed that children's anxiety was indirectly correlated with their life skills through the mediating effect of self-regulation. In addition, it was seen that anxiety levels were lower among children who spent a long time in preschool education and that girls displayed higher self-regulation and life skills compared with boys. Since significant relations were observed between gender and the core variables of the study, it was concluded that gender could be considered the control variable. When the

hypotheses were tested separately, the findings showed that children's anxiety did not predict their life skills directly. In other words, although anxiety does not weaken children's life skills directly, it affects their life skills negatively by weakening the effect of self-regulation on life skills. The findings of some previous studies report a correlation between children's anxiety and life skills. For instance, Drahota et al. (2013) state that school-age children with anxiety disorder hold decreased daily life skills. Moreover, Drahota et al. (2011) suggest that cognitive behavioral therapy aiming at childhood anxiety could make a change both in the symptoms of anxiety disorder and the daily life skills of children. In light of the present study and the related literature, it is plausible to accept the possibility of a mutual relationship between deficits in life skills and anxiety. Lack of using skills (such as the failure to provide adequate stimulating environmental conditions or parental perfectionism) could trigger anxiety in some children (separation anxiety, social phobia etc.). In addition, Mostafazadeh et al. (2022) found that play therapy supporting life skills decreased children's anxiety. In another study, Lee et al. (2020) observed that life skills education increased emotional regulation and reduced depressive symptoms among primary school children. Studies in the literature have revealed that a purposive intervention effectively supports children's life skills. This finding indicates the importance of supporting children's skills (such as self-regulation skills) by implementing mediating interventions instead of focusing directly on their anxiety levels.

The study's findings showed that anxiety considerably decreased life skills in children. Anxious children tend to display poor self-regulation, which includes emotions, behavior and attention as well (Eisenberg et al., 2001; Morosanova & Fomina, 2017; Visu-Petra & Marcus, 2019) because anxious children have difficulty in regulating their emotions effectively (Eisenberg & Spinrad, 2004; Hannesdottir & Ollendick, 2007). Negative emotions like anxiety and worry could interfere with one's ability to explore situations by preventing children from focusing on managing potential threats and obstacles (Wells & Matthews, 2014). Previous studies have reported that positive emotions in young children anticipate better inhibitory control and self-regulation, serving as a buffer against behavioral problems (Carrasco et al., 2016; Ginsburg, 2007; Kim et al., 2013; Kochanska et al., 2007; White et al., 2011). These findings imply that interventions in which anxiety management and stress reduction are taught (mindfulness, play therapy etc.) could be beneficial, particularly in improving children's self-regulation skills. In addition, positive emotional environments to be created by parents would protect children for their self-regulation and help them reduce their anxiety.

In line with the literature, as seen in this study, self-regulation skills have been proven to be effective in supporting life skills and reducing anxiety in children (LaBillois & Lagacé-Séguin, 2009; Rademacher et al., 2022; Webster-Stratton & Reid, 2004). Self-regulation encompasses cognitive, emotional, and behavioral processes essential for problem-solving and goal-directed behaviors (Zelazo & Müller, 2002). The results obtained reveal that self-regulation affects life skills positively. Several studies in the literature support the link between self-regulation and life skills. For instance, Güler-Yıldız et al. (2014) found a significant relationship between child-teacher interaction quality and executive functions, which are vital for interpersonal communication skills. Similarly, deficits in self-regulation, including attention focusing and inhibitory control, were found to be associated with lower scores in life skills such as cooperation, participation, and empathy (Teglasi et al., 2015; Veijalainen et al., 2017). Self-regulation deficits pose significant risks for psychological disorders and hinder essential daily life skills, such as problem-solving, decision-making, and coping (Denham et al., 2014; von Salisch et al., 2015). These deficits may result in difficulties for individuals in resisting impulses and maintaining appropriate behaviors, ultimately affecting their overall functioning. Early development of self-regulation skills in children is crucial in potentially

preventing psychological disorders later in life, making it essential to implement effective interventions targeting children's self-regulation during early childhood (Eisenberg et al., 2000; Öztabak, 2017; Ezmeci, 2019). Studies have shown that children who participated in self-regulation intervention programs exhibited higher levels of social and emotional behaviors, underscoring the importance of early identification and intervention for individuals at risk of psychological disorders (Öztabak, 2017; Ezmeci, 2019).

Finally, the research model shows that anxiety predicts life skills indirectly through its negative effect on self-regulation in early childhood. This finding suggests that early childhood anxiety regulation interventions would support children's self-regulation skills (Rademacher & Koglin, 2019; Rademacher et al., 2022). For instance, programs like Mindfulness-Based Stress Reduction (Kabat-Zinn, 1990), Mindfulness-Based Cognitive Therapy (Segal et al., 2002) and Calm Classroom offer different techniques for developing children's self-regulation skills and reducing stress. Each program is designed in accordance with children's ages and needs. Such interventions could help children learn especially emotional regulation and anxiety management skills, thus boosting their self-regulation skills and life skills.

There is a consensus in the literature that life skills act as a buffer in preventing risky behavior that could appear in later years (Orgilés et al., 2019). Establishing life skills in the early years of life to develop positive behaviors will help in overcoming challenges like emotional pain, conflict, peer pressure and relationship problems (Coplan & Ooi, 2013; Perren & Alsaker, 2009) that are caused by internalizing behaviors such as anxiety disorder, which could pose a risk for the development of life skills. The literature commonly addresses life skills during middle childhood (Botvin et al., 2003; Lee et al., 2020; Winarsunu et al., 2023). Studies conducted during early childhood are relatively scarce and limited, yet this study unveil distinctive and specific findings on the subject. Moreover, the outcomes of the current study highlight the potential usefulness of cultivating self-regulation skills in other domains, such as lifelong learning and life skills.

### **Limitations and directions for future research**

It is important to note that the present study has certain limitations. The use of parent-reported measures and the reliance on observational methods to assess children's skills may introduce bias and limit the generalizability of the findings. Future studies can use experimental designs to examine relationships in more detail and more precisely determine cause-effect relationships. In addition, the present study assessed the relationships between children's anxiety, self-regulation, and life skills using an observational method. Future research could use a wider range of assessment tools to provide a more comprehensive understanding of the relationships examined and combine multiple perspectives, including direct measures of children's self-regulation and life skills. For example, direct survey methods (e.g., 48-60 Month Child Self-Regulation Battery; Keleş, 2014; Preschool Self-Regulation Assessment; Smith-Donald et al., 2007) could be used to assess self-regulation and life skills. The direct survey method could yield more specific results on developing self-regulation.

The generalizability of the study may be limited given the size and diversity of the sample. However, the results show that anxiety is a significant risk factor for children's emotional, social, and cognitive regulation. The present study made a unique contribution to the literature by exploring novel relationships among anxiety, self-regulation, and life skills in children. Future studies can contribute to a better understanding of these relationships by

examining different cultures, age groups, and socioeconomic conditions with larger sample sizes.

Difficulties in appropriately regulating emotions, behavior, and attention prevent children from successfully adapting to the social and academic demands of school. The development of appropriate interventions to support children's self-regulation is recommended. This study also showed that more research is needed to better understand the contexts associated with life skills in early childhood.

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## **CONFLICTS OF INTEREST**

The authors declare that there are no conflicts of interest regarding the publication of this study.

## **AUTHOR CONTRIBUTIONS**

The author was responsible for the conception and design of the study, data collection, data analysis, interpretation of the findings, and preparation of the manuscript.

## **DECLARATION OF GENERATIVE AI USE**

No generative artificial intelligence (AI) tools were used in the design, data collection, analysis, interpretation of the findings, or writing of this manuscript.

## **DATA AVAILABILITY STATEMENT**

The data that support the findings of this study are available from the author upon reasonable request.

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