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Self-Regulation in Children Attending Preschool Institutions That Implement Different Educational Approaches

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Abstract

In recent years, there has been a rise in preschools adopting alternative educational approaches due to increased interest. Researchers have focused on how these approaches affect children's development. This study compares self-regulation in Montessori Preschool and preschools implementing the Ministry of National Education curriculum using a casual comparative research model. The sample includes 140 children aged 48-72 months from Montessori, private, and state preschools. Data was collected with a Personal Information Form and Preschool Self-Regulation Assessment measuring attention, emotion, and behaviour regulation. Montessori students exhibited higher self-regulation and positive emotion regulation. Six-year-olds scored higher in attention/impulse control. Young parents' children had higher self-regulation levels. Overall, self-regulation in the study group was high. The study discusses these findings in the context of existing literature and offers practical recommendations for future research.

Keywords: preschool period, self-regulation, Montessori school, state school

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Introduction

In recent years, researchers have begun to consider the effects of differences in kindergarten experiences on children's development (Ansari et al., 2020; Friedman-Karus et al.,2019; Vitiello et al., 2022). Studies have shown that children's academic achievement is higher when they receive preschool education compared to children who do not (Erkan & Kırca, 2010; Gayret & Çiçekler-Yıldız, 2021; Schweinhart et al., 2005; Yaşar & Aral, 2010). However, studies on the differences in the development of children by the programs implemented in preschool education institutions were limited to academic success. On the other hand, one of the essential skills that children acquire with

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preschool education is self-regulation. Self-regulation is a skill that develops the child's ability to work independently in personal and social contexts and affects her/his behaviors (Oktay, 1990; Shonkoff & Phillips, 2000). Self-regulation skills in the preschool period refer to managing cognitive, affective, and behavioral expressions to reach a designated target (Ertürk-Kara et al., 2018). Despite the differences in the definition of self-regulation in the literature, there is an agreement that it is essentially a broad concept that includes voluntary processes (Zauza et al., 2022). Self-regulation is defined as individuals' directing themselves (Zimmerman, 2002), setting a goal to regulate themselves, and having sufficient motivation to maintain this goal (Howard et al., 2018). According to Berger (2011), self-regulation involves such skills as attention, inhibiting reflexive actions, and delaying gratification.

Children's self-regulation predicts many positive outcomes like the quality of their social interactions, learning capacity, and school readiness in preschool (Blair, 2002; Eisenberg, 2012; Erkan & Sop, 2018). Once children step into preschool, they need to use their self-regulation skills frequently during the day to join activities in small and large groups. Children lacking self-regulation skills struggle to establish and maintain positive relationships with their teachers and peers, control undesired behaviors, pay attention, and follow instructions (Blair & Diamond, 2008; McClelland & Tominey, 2014). Poor self-regulation is reflected as impulsive and careless behaviors in children and youth (Piehler et al., 2020; Portilla et al., 2014). If a preschooler has failed to build sufficient social interaction and her/his impulse control is underdeveloped, s/he may have great difficulty when s/he gets into different circles with a new environment and may face socially challenging situations (Ertürk, 2013).

Creating rich, stimulating settings for children's self-regulation supports successive periods, including critical times (McClelland & Cameron, 2012). The classroom environment required for self-regulative learning, social events experienced, and the physical features of one's context play a critical role in self-regulation (Zimmerman, 1990). Among the components of self-regulation, effort control, self-control, and willingness are considered essential skills for children to achieve in-class academic skills and fulfill tasks (Çiltaş, 2011). Thus, they need to be evaluated individually to support their self-regulation in learning, development, and adaptation to social life. Findings to be obtained from the evaluation would set the fundamental basis for the support given to the child (Fındık-Tanrıbuyurdu & Güler-Yıldız, 2014). Therefore, developing and promoting self-regulation in early childhood is an effective way of reaching long-term school achievement (McClelland & Cameron, 2012).

Early childhood education programs are critically important for children's school achievement in terms of the child's self-awareness and external support (Bowne et al., 2017). Contemporary preschool education approaches adopt an educational perspective that puts the child in the center, understanding her/him and supporting her/him according to her/him needs. In this regard, constructivist and multi-cultural approaches can improve preschool education programs. Early childhood programs vary according to time, environment, and culture (Kargı, 2011). One of these programs is the Montessori Approach. Montessori education is a system developed by Dr. Maria

Montessori and integrated the world for children progressing to this end (Williams & Keith, 2000). Montessori's theories on child development are considerably different and historically strong, usually referred to as a framework to inform other views of education (Aljabreen, 2020). In addition, Montessori approached education as a scientist, observed children carefully, developed intuitive hypotheses over their behaviors, and used the classroom as a laboratory setting (Thayer-Bacon, 2011). Montessori education relies on the philosophy that a child's creativity comes out in a natural environment. Teaching takes place thanks to the child's independence (Aljabreen, 2017). This approach encourages active learning and participation through approaches that support the child's independence (Holmes, 2018). In an environment where the child's creativity is at the forefront, the child can take responsibility for learning on her/his own, discover the learning paths, acquire self-regulation skills and establish inner discipline by building internal control without adult interference (Güral, 2015). Children in Montessori schools work individually or in small groups with specially designed materials and display their natural tendencies in stable environments (Edwards, 2003; Efe & Ulutaş, 2022). Children determine and act in their space concerning their peers and classroom rules in such classrooms. They speak as they wish in their communication, and their self-expression skills are improved. Thus, respect and communication with other children allow internalization when setting the main classroom rules (Castellanos, 2002).

Tasks and responsibilities are given to children in the Montessori approach to help them cope with any possible problem and increase their independence. Thus, scaffolding is ensured for self-regulation in children in such classes (Breiman & Coe, 2016). A child has to be free to be able to learn self-regulation, take her/his learning responsibility, discover the paths to learning and build inner discipline (Güral, 2015). This freedom is vital for the self-regulated learning and self-efficacy levels of children's perceptions of working in groups in the Montessori approach to education. In the related literature, children's self-regulation has been studied in such terms as its socio-cultural, socioeconomic, academic, emotional, behavioral, and cognitive aspects and motivation (Berhenke, 2013; Graziano et al., 2007; Jahromi & Stifter, 2008; Raver, 2004). Many studies have concluded that children who received Montessori education have higher academic achievement levels than their peers attending preschool education with a centralized curriculum (Denervaud et al., 2019; Ervin et al., 2010; Lillard, 2012; Lopata et al., 2005; Manner, 2007; Toran & Temel, 2014; Üstündağ, 2019). Studies emphasize that the Montessori approach is an educational approach that affects children's self-regulation skills (Ervin et al., 2010; İman et al., 2017; Kuşçu et al., 2014). In this approach, teachers prepare activities that match children's interests and make them attractive. As a result, children select their activities independently and acquire the skills to regulate their behaviors at a young age. In addition, children feel more comfortable asking for help from their peers in the class. For learning to take place, it is ensured that children learn by focusing their attention on each other rather than the teacher. Montessori materials are didactic and are thought to teach children to focus their attention on a task at an early age. Therefore, the structure of Montessori classrooms is considered to provide settings that enable self-regulated learning in various ways (Castellanos, 2002).

In Montessori education, children develop their understanding and approach of a given event and realize their learning process. The fact that children control themselves and realize their learning process with the error control included in the approach is seen to be parallel with the idea that children take responsibility for their learning process and make plans in line with their goals, which is central to self-regulation (Tiryaki et al., 2021). This educational approach also has many aspects in common with the sub-dimensions of self-regulation. For example, attention regulation sub-dimensions include maintaining attention, managing attention, and displaying goal-specific behaviors. Emotion regulation processes involve correctly expressing emotions, planning, self-monitoring, recalling, problem-solving, and organizing (Ervin et al., 2010).

On the other hand, behavior regulation refers to processes like self-evaluation, impulse control, patience, and waiting for turns (Kıyaker, 2017). In this respect, despite the child's learning process, the physical order of the classroom, individualist objectives, and the teacher's readiness, the child has to be socially and emotionally ready to work with others in the class. Therefore, to promote young children's social and emotional development, opportunities should be provided to learn and practice these skills. Furthermore, in addition to learning these skills, self-regulation skills need the same opportunities for peer relationships (D'Apolito, 2016).

The Montessori approach expresses that children's self-efficacy levels and self-regulation skills are connected with their self-esteem in their academic achievement. This expression reflects the importance attached by Montessori to intrinsic motivation in learning. Thus, children target intrinsic achievement instead of extrinsic rewards (Castellanos, 2002). A Montessori teacher prepares the child for inner change by internalizing the value of respect for children and the developmental importance of the activities performed during childhood (Rathunde, 2001). In this approach, the teacher helps and encourages children. S/he allows children to develop confidence and inner discipline, ensuring less interference with the child's development (Edwards, 2003). The Montessori approach in education focuses on children's differences. It mentions the significance of self-regulation in life as individuals who regulate themselves in cognitive and social areas, determine their learning strategies, act according to their goals, and maintain this behavior. While children learn to be controllable with traditional education, the Montessori approach teaches children to be capable and committed to each other (Williams & Keith, 2000).

Aim of the Study

The present study aimed to compare the self-regulation levels of children attending a Montessori preschool, a state preschool implementing the centralized curriculum, and a private preschool. Unlike the studies in the related literature (Aral et al., 2019; Ervin et al., 2010; Gündoğdu, 2021; Kayılı, 2015; Mercan, 2019; Shiu et al., 2018; Tiryaki et al., 2021) investigating the effect of the Montessori approach on self-regulation, the present study aimed to compare the self-regulation of children attending schools that implement three different educational approaches. By comparing self-regulation levels of preschool children attending institutions that implement different educational approaches, the study

will highlight the importance of curricular practices that will evaluate children's self-regulation skills and determine and support their needs concerning self-regulation development.

This study seeks answers to the following questions:

1. How are preschool children's levels of self-regulation skills?
2. Do preschool children's self-regulation skills vary by educational approach?
3. Do preschool children's self-regulation skills significantly vary by gender?
4. Do preschool children's self-regulation skills significantly vary by age?
5. Do preschool children's self-regulation skills significantly vary by the mother's and father's age?
6. Do preschool children's self-regulation skills significantly vary by the mother's and father's level of education?

Method

Research Design

The present study was designed in the casual-comparative research model to compare the self-regulation levels of 4-6-year-old children attending a Montessori preschool, a state preschool, and a private preschool affiliated with the Ministry of National Education (MoNE). Studies that aim to determine the reasons and results of the differences between groups without any manipulation are casual-comparative studies (Büyüköztürk et al., 2018; Şahin, 2021).

Participants

The participants consisted of children attending a Montessori preschool in a city center, a private preschool that implements a particular curriculum supplemented by the MoNE curriculum, and a state preschool in a city affiliated with the MoNE. In Turkey, private preschools are affiliated to the Ministry of Family, Labor and Social Services (MoFLSS). Within the scope of this study, Montessori preschool is a preschool affiliated to the MoFLSS, while private preschool is affiliated to the Ministry of National Education. Montessori preschool applies a curriculum in accordance with this approach. The private preschool uses practices such as early literacy and second language education in addition to the MoNE curriculum. Using criterion sampling, the inclusion criteria were accepted as maintaining school criteria for the purpose of the research and going to state-run kindergartens with children aged 4-6. The study sample consisted of children attending kindergartens in schools implementing three different curricula. The demographic characteristics of the study group are shown in Table 1.

Table 1

Distribution of the Demographic Characteristics of the Study Group

Variable	Categories	*n*	%
Gender	Girls	59	42.1
	Boys	81	57.9
	Total	140	100
Age Group	4 Years	25	17.9
	5 Years	53	37.9
	6 Years	62	44.3
	Total	140	100
Mother's Age	26-30	32	22.9
	31-35	54	38.6
	36-40	41	29.3
	41 and over	13	9.3
	Total	140	100
Mother's Level of Education	Middle school	10	7.1
	High-school	24	17.1
	Associate Bachelor's/Master's	14	10.0
	Total	92	65.7
Father's Age	26-30	16	11.4
	31-35	40	28.6
	36-40	47	33.6
	41 and over	37	26.4
	Total	140	100
Father's Level of Education	Primary/Secondary	10	7.1
	High-school	20	14.3
	Associate Bachelor's/Master's	19	13.6
	Total	91	65
Educational Approach	Private Preschool	50	35.7
	Montessori Preschool	47	33.6
	State Preschool	43	30.7
	Total	140	100

As seen in Table 1, 57.9% of the children in the study group are boys. 44.3% are six-year-olds. 38.6% of the mothers are aged 31-35, and 65.7% have a Bachelor's/Master's degree. 33.6% of the fathers are aged 36-40, and 65% have a Bachelor's/ Master's degree. 35.7% of the children attend a private school, 33.6% Montessori, and 30.7% attend state preschool.

Data Collection Tools

Data was collected using the personal information form and Preschool Self-Regulation Assessment (PSRA).

Personal Information Form

The 5-item personal information form was developed by the researcher to obtain information about children's demographic characteristics: children's gender and age, parents' age, and level of education.

Preschool Self-Regulation Assessment (PSRA)

Data concerning the children's self-regulation were collected using the Preschool Self-Regulation Assessment (PSRA). The scale was developed by Smith-Donald, Raver, Hayes, and Richardson (2007) and was adapted to Turkish by Fındık-Tanrıbuyurdu in 2012. In the study by Fındık-Tanrıbuyurdu (2012), which focused on the adaptation of the PSRA into Turkish, the self-regulation sub-scales of the scale were found to comprise two sub-scales: attention/behavior regulation and emotion regulation. This scale is a measurement tool that enables performance-based assessment. The PSRA includes two main sections: The Assessor Report for the tasks the child is expected to perform and the PSRA Assessor Report Examiner Rating Scale.

Assessor Report. It includes codes for nine tasks to assess children's self-regulation performance. Toy Wrap, Candy Hide, and Tongue Task tasks determine children's delayed gratification levels. Balance Beam, Tower Task, and Pencil Tap tasks are performed to evaluate children's executive control indicating their ability to follow instructions. Tower Cleanup, Toy Sorting, and Toy return tasks are carried out to evaluate children's social adaptation skills (Fındık-Tanrıbuyurdu & Güler Yıldız, 2014). In this part of the scale, coding is conducted for children's performance. For example, in the Balance Beam task, seconds for each child are recorded on the code sheet in line with the instructions given. In the Pencil Tap task, children are instructed to tap the pencil a number of times that is the opposite number of the assessor's tap. For instance, if the assessor taps once, the child is asked to tap twice. When the evaluator taps the pencil twice, the child has to tap once. This act is repeated 16 times. The results are marked as correct/incorrect, and the correct responses are added with 1 point for each.

Assessor Report Examiner Rating Scale. This form is the second part of the scale. It enables the assessor to evaluate the child's emotion, attention level, and behavior based on assessor-child interaction. The scale is scored as 0, 1, 2, and 3. The items include behavioral indicators with 0 for the lowest and 3 for the highest. The scale comprises 16 items in total, with ten items on attention-impulse control and six items on positive emotion. The maximum possible score to be obtained on the scale is 48. Some items on the scale are reverse-coded. The scale has a two-factor construct. Cronbach's Alpha internal consistency coefficient was calculated as 0.83 for the overall scale. It was calculated as 0.88 for Attention/Impulse Control (AIC) and 0.80 for Positive Emotion (PE) (Fındık-Tanrıbuyurdu & Güler Yıldız, 2014). Cronbach's Alpha internal consistency coefficient was calculated as 0.76 for the overall scale. It was found as 0.83 for AIC and 0.70 for PE within the scope of this research.

Data Collection and Analysis

A brief training was received on the materials and application process of the scale used to assess children's self-regulation levels. In addition, the researcher made contact with the scale's researcher, who provided the necessary materials.

Prior to commencing the data collection process, parental consent forms and voluntary personal information forms were sent to parents through school authorities. The

children were informed that the researcher in the classroom environment would perform a short individual activity. After informing the children, the children who wanted to participate in the performance test were determined by the researcher. The activities were performed in 30-40 minutes on average, with each child sitting face-to-face at tables and chairs suitable for children. The data were collected during the 2020-2021 academic year.

In the analysis stage, skewness and kurtosis values were examined to see whether the variables were distributed normally. The Shapiro-Wilk test was conducted for normal distribution. Non-parametric tests were used for the mean score comparisons of the data that were not distributed normally. In addition, the Levene test was carried out to determine whether the variance was distributed equally or not prior to variance analysis. The level of significance was accepted as 0.05. Effect size indices were calculated and reported to identify the effect size of the independent variable on the dependent variable in the tests that showed significant differences. The importance of effect size study findings in practice is to evaluate Type I and Type II errors and make accurate deductions concerning the significance of the findings. Eta2 representing the effect size can be defined as the proportion of variance accounted for by the main effects, interactions, and errors in a study comparing group means (Tabachnick & Fidell, 2001). Eta2 values of .01, .06, and .14 indicate small, medium, and large effect sizes, respectively (Green & Salkind, 2012). Bonferroni correction was made to control Type I error during the tests. Participants' self-regulation was evaluated separately for each group, and mean standard deviation and variance values were calculated for the scores obtained from the tests. The results of the normality test are shown in Table 2. It is seen in Table 2 that the total self-regulation score from the Shapiro-Wilk test, AIC, and PE values and the data from a normal distribution are statistically significantly different: *p* values are .000, .000, .001, respectively.

Table 2

Normality Test Results of Preschoolers' Self-Regulation Scores

Sub-dimensions	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistics	*df*	*p*	Statistics	*df*	*p*
AIC	.164	140	<.001	.853	140	<.001
PE	.122	140	<.001	.962	140	.001
Self-regulation	.104	140	.001	.933	140	<.001

Results

Total self-regulation scores of the preschoolers and the descriptive statistics for the sub-scales are presented in Table 3. The maximum score that children can obtain on the PSRA is 48. Table 3 shows the children's mean AIC scores ($\bar{X}$ = 26.01), mean PE scores ($\bar{X}$ = 13.43), and total self-regulation scores ($\bar{X}$ = 39.44). Kruskal-Wallis test results of the preschoolers' total self-regulation scores, AIC scores, and PE scores according to educational approach groups are shown in Table 4. It is seen in Table 4 that means there is no statistically significant difference in AIC scores according to educational approach groups [$\chi^2(2, N = 140) = 3.422, p = .181$].

Table 3

Descriptive Statistics Concerning the Preschoolers' Self-Regulation Scores

Sub-dimensions	*n*	Min	Max	$\bar{X}$	*SD*	Skewness	Kurtosis
AIC	140	14	30	26.01	3.41	-1.49	2.32
PE	140	7	18	13.43	2.66	-0.28	-0.77
Self-Regulation	140	23	48	39.44	4.84	-1.04	1.56

Table 4

Kruskal Wallis H Test Results by Educational Approach

Sub-dimensions	Educational Approach	*N*	MR	df	χ^2	*p*
AIC	Private School	50	63.69	2	3.422	.181
	Montessori School	47	69.86			
	State School	43	79.12			
PE	Private School	50	62.65	2	33.238	<.001*
	Montessori School	47	97.22			
	State School	43	50.42			
Self-Regulation	Private School	50	62.26	2	13.791	.001*
	Montessori School	47	88.33			
	State School	43	60.59			

A statistically significant difference was observed in children's self-regulation PE scores in school-type groups [$\chi^2(2, N = 140) = 33.238$, $p = .000$, $\eta^2 = 0.24$]. Mann-Whitney U test was performed to evaluate the differences between each pair among the three groups classified according to educational approach. According to the Bonferroni correction to control Type I error during the tests, a significant difference exists between the private school and Montessori school ($p < .0167$) and between the Montessori school and state school ($p < .025$).

It is seen that self-regulation total mean scores significantly vary by educational approach [$\chi^2(2, N = 140) = 13.791$, $p = .001$, $\eta^2 = 0.10$]. According to the Bonferroni correction, there is a significant difference between the private school and Montessori school ($p < .0167$) and between the Montessori school and state school ($p < .025$).

Table 5 shows the Mann-Whitney U test results concerning the statistical difference in self-regulation mean scores in gender groups. According to Table 5, $U = 2137.000$, $Z = -1.069$, $p = .285$. The mean rank is 67.38 in boys, while 74.78 in girls. There is no statistically significant difference between mean AIC scores in gender groups ($U = 2072{,}500$, $Z = -1.350$, $p = .177$). Similarly, no statistically significant difference was observed between mean PE scores according to gender groups ($U = 2317{,}500$, $Z = -.306$, $p = .760$).

Table 5

Mann-Whitney U Results by Gender Variable in Preschoolers

Sub- dimensions	Gender	*N*	MR	MT	U	Z	*p*
AIC	Boy	81	66.59	5393.50	2072.50	-1.350	.285
	Girl	59	75.87	4476.50			
PE	Boy	81	69.61	5638.50	2317.50	-.306	.177
	Girl	59	71.72	4231.50			
Self-Regulation	Boy	81	67.38	5458.00	2137.00	-1.069	.760
	Girl	59	74.78	4412.00			

Table 6 shows the Kruskal-Wallis test results of preschoolers' total self-regulation scores and their AIC and PE subscales scores according to age groups. When Table 6 is examined, it is seen that there is a statistically significant difference between the mean scores of the self-regulation AIC sub-scale by age groups according to the test results [$\chi^2(2, N = 140) = 10.875$, $p = .004$, $\eta^2 = 0.08$].

Table 6

Kruskal Wallis H Test Results of Preschoolers According to Age Groups

Sub-dimensions	Age Group	*N*	MR	*df*	χ^2	*p*
AIC	4 Years	25	47.62	2	10.875	.004*
	5 Years	53	71.39			
	6 Years	62	78.97			
PE	4 Years	25	66.66	2	.961	.619
	5 Years	53	67.97			
	6 Years	62	74.21			
Self-Regulation	4 Years	25	53.84	2	7.128	.028*
	5 Years	53	68.41			
	6 Years	62	79.01			

Mann-Whitney U test was performed to evaluate the differences between each pair in the three groups created according to age. Three Mann-Whitney U tests were conducted in total for the paired comparisons of the three groups. With the Bonferroni correction, testing was conducted by dividing the number of comparisons at the alpha level ($\alpha = .05$) for each comparison, and three paired comparisons were made in total. Alpha levels were found as $.05 / 3 = .0167$, $.05 / 2 = .025$ and .05 for these tests respectively. Later, putting the *p* values into ascending order, the smallest was compared with .0167, the second with .025, and the last with .05. The results of these tests showed a significant difference only between the four-year-old ($\bar{X} = 36.92$) and six-year-old ($\bar{X} = 40.55$) groups ($p < .0167$).

Statistically significant differences between age groups in self-regulation mean scores were found [$\chi^2(2, N = 140) = 7.128$, $p = .028$, $\eta^2 = 0.05$]. In addition, 3 Mann-Whitney U tests were conducted in total for the paired comparisons of the three groups. According to the Bonferroni correction results, a significant difference was found between the mean scores of four-year-olds ($\bar{X} = 53.84$) and six-year-olds ($\bar{X} = 79.01$).

Total self-regulation scores and the scores obtained on preschool children's AIC and PE sub-scales were tested with Kruskal Wallis considering mothers' age. Test results are presented in Table 7. As seen in Table 7, there is no significant difference in mean scores on the AIC sub-scale regarding mothers' age [$\chi^2(3, N = 140) = 2.371, p = .499$]. Furthermore, according to the test results, there is no significant difference in mean PE scores among mothers' age groups [χ^2 $(3, N = 140) = 13.927, p = .003, \eta^2 = 0.10$]. Six Mann-Whitney U tests were conducted to compare the four different groups. Bonferroni correction showed significant differences between the 21-30 age group and 41 and over age group ($p < .0083$), between the 21-30 age group and 36-40 age group ($p < .010$) and between the 36-40 age group and 41 and over age group ($p < .0125$).

Table 7

Kruskal Wallis H Test Results According to Mothers' Age

Sub-dimensions	Mother's Age	*N*	*MR*	*df*	χ^2	*p*
AIC	21-30	32	71.33	3	2.371	.499
	31-35	54	67.21			
	36-40	41	77.35			
	41 and over	13	60.50			
PE	21-30	32	91.97	3	13.927	.003*
	31-35	54	66.53			
	36-40	41	65.87			
	41 and over	13	48.77			
Self-Regulation	21-30	32	84.67	3	8.667	.034*
	31-35	54	65.85			
	36-40	41	72.60			
	41 and over	13	48.31			

Total self-regulation scores were observed to vary significantly by mothers' age [χ^2 $(3, N = 140) = 8.667, p = .034, \eta^2 = 0.06$]. Six Mann-Whitney U tests were conducted to compare the four different groups. According to Bonferroni correction, a significant difference exists only between the 21-30 age group ($\bar{X} = 41.25$) and the 41 and over age group ($\bar{X} = 36.85$) ($p < .0083$).

Total self-regulation scores and the scores obtained on preschool children's AIC and PE sub-scales were tested with Kruskal Wallis considering fathers' age. Test results are presented in Table 8. Table 8 shows the results of the Kruskal Wallis test to see if there was a significant difference between AIC sub-scale mean scores in terms of the father's age. The results indicated no statistically significant difference among fathers' age groups [$\chi^2(3, N = 140) = .340, p = .952$]. On the other hand, significant differences were seen in the PE sub-scale mean scores in the father's age [$\chi^2(3, N = 140) = 14.939, p = .002, \eta^2 = .11$]. Six Mann-Whitney U tests were conducted to compare the four different groups. According to the Bonferroni correction, there are significant differences between the 21–30-year-old ($\bar{X} = 41.56$) and 41 and over ($\bar{X} = 38.05$) age groups ($p < .0083$), between the 21-30-year-old ($\bar{X} = 41.56$) and 36-40-year-old ($\bar{X} = 39.51$) age groups ($p < .010$) and between the 36-40-year-old ($\bar{X} = 39.51$) and 41 and over ($\bar{X} = 38.05$) age groups ($p < .0125$).

Table 8

Kruskal Wallis H Test Results According to Fathers' Age

Sub-dimensions	Father's Age	*N*	*MR*	*df*	χ^2	*p*
AIC	21-30 3	16	68.50	3	.340	.952
	31-35	40	68.98			
	36-40	47	73.26			
	41 and over	37	69.51			
PE	21-30	16	94.81	3	14.939	.002*
	31-35	40	81.64			
	36-40	47	64.38			
	41 and over	37	55.72			
Self-Regulation	21-30	16	87.84	3	6.960	.073
	31-35	40	77.00			
	36-40	47	67.78			
	41 and over	37	59.43			

Total self-regulation scores and the scores obtained on the AIC and PE sub-scales of preschool children were tested for significant differences with Kruskal Wallis according to mothers' level of education. Test results are presented in Table 9. When Table 9 is examined, it is seen that there is no significant difference between mothers' level of education groups in terms of total self-regulation scores [$\chi^2(3, N = 140) = 3.105$, $p = .376$]. In addition, no statistically significant difference was seen between the mothers' level of education groups' mean scores of AIC and PE sub-scales in the mothers' level of education groups [$\chi^2(3, N = 140) = 1.942$, $p = .584$; $\chi^2(3, N = 140) = 2.456$, $p = .483$].

Table 9

Kruskal Wallis H Test Results According to Mothers' Level of Education

Sub-dimensions	Mother's Level of Education	*N*	*MR*	*df*	X^2	*p*
AIC	Primary/Secondary	10	59.30	3	1.942	.584
	High School	24	79.02			
	Associate	14	67.68			
	Bachelor's/Master's	92	69.92			
PE	Primary/Secondary	10	52.70	3	2.456	.483
	High School	24	73.58			
	Associate	14	65.96			
	Bachelor's/Master's	92	72.32			
Self-Regulation	Primary/Secondary	10	50.45	3	3.105	.376
	High School	24	75.69			
	Associate	14	66.50			
	Bachelor's/Master's	92	71.93			

Kruskal Wallis test results for the total self-regulation scores and the scores obtained on the AIC and PE sub-scales of preschool children according to fathers' level of education are presented in Table 10. It is seen in Table 10 that the Kruskal Wallis test was performed to determine whether significant differences existed between the AIC mean scores and total self-regulation scores in the fathers' level of education groups. Test

results show no statistically significant difference between fathers' level of education groups [$\chi^2(3, N = 140) = 3.560, p = .313$; $\chi^2 (3, N = 140) = 7.786, p = .051$].

Table 10

Kruskal Wallis H Test Results According to Fathers' Level of Education

Sub-dimensions	Father's Level of Education	*N*	MR	*df*	X^2	*p*
AIC	Primary/Secondary	10	83.30	3	3.560	.313
	High School	20	62.20			
	Associate	19	81.74			
	Bachelor's/Master's	91	68.57			
PE	Primary/Secondary	10	46.15	3	9.499	.023*
	High School	20	54.50			
	Associate	19	83.68			
	Bachelor's/Master's	91	73.94			
Self-Regulation	Primary/Secondary	10	60.45	3	7.786	.051
	High School	20	53.18			
	Associate	19	87.61			
	Bachelor's/Master's	91	71.84			

On the other hand, statistically, a significant difference was found between the PE mean scores in fathers' level of education groups [$\chi^2(3, N = 140) = 9.499, p = .023, \eta^2 = .05$]. To adjust for alpha inflation with multiple tests, a Bonferroni correction factor was applied to six Mann-Whitney U tests conducted, comparisons were only significant if they reached the $p < .008$ level of significance (i.e., .05/6 = .008). The three paired group comparisons (p = .012, p = .016, and p = .044) were not statistically significant.

Discussion and Conclusion

The present study compared the self-regulation levels of children receiving Montessori education and those attending schools implementing the MoNE curriculum. The results of the study indicate that children have high self-regulation skills. In the attention/impulse control sub-scale, the children had a quite high mean score. Thus, it can be suggested that children show a high level of attention/impulse control. It was found that the children displayed high performance in the positive emotion sub-scale, as well. Children may have difficulties regulating their behavior and emotions, such as following directions, taking turns, or expressing feelings. Through preschool education, children acquire many social skills, such as internalizing the rules, playing cooperatively, and sharing items. These skills are essential in the development of children's self-regulation. The fact that the children participating in the research receive preschool education is thought to be effective in their high self-regulation skills. Similarly, Fındık-Tanrıbuyurdu and Güler-Yıldız (2014) found that children who had preschool education performed high self-regulation performances in their study. Self-regulation is a critical skill to be successful in social and learning environments. Graziano et al. (2007) report that emotion regulation plays a vital role in children's academic achievement and productivity in the classroom. Studies show that behavior regulation and attention regulation development are highly critical for other development areas of children. For example, Montroy (2014) and

Alarcón-Rubio, et al. (2014) found that behavior and attention regulation during the preschool period influences early mathematical skills, early literacy skills, and speech forms. Denham et al. (2012) stated that the developmental changes in preschoolers' positive emotions and self-regulation are correlated with their future academic achievement. The study has come up with consistent results with the related literature

The study results show a significant difference between the private school and Montessori school and between the Montessori school and state school in terms of children's self-regulation skills and positive emotion sub-scales. This difference appears to be in favor of the Montessori school. Children's self-regulation development in the early childhood period can be achieved through early childhood education programs that focus on children's all developmental domains and involve rich environmental conditions in this respect. The related literature includes studies that highlight the importance of effective education programs and classroom practices in developing children's self-regulation skills (Aral et al., 2019; Yurteri-Tiryaki et al., 2021; Rimm-Kaufmann et al., 2009; Mashburn et al., 2008; Vasseleu et al. 2021; Vitiello et al., 2022). In addition, in such countries as the United States of America, it is seen that self-regulation is supported through curriculum or curriculum extension approaches as well (e.g., Tools of The Mind (Bodrova & Leong, 2007), Chicago School Readiness Project (Raver et al., 2008)). However, although the Montessori approach does not explicitly define self-regulation, it aims to raise children who have self-control, problem-solving skills, high self-confidence, and who can make decisions on their own and implement them. Studies have proven that children have high self-regulation in schools that implement different educational curricula. For instance, Mercan and Özbey (2020) reports that 5-6 year-old children attending private schools have higher self-regulation skills, academic self-concept and self-esteem, and interpersonal problem-solving skills. However, Kayılı (2015) states that children in Montessori schools have higher social problem-solving and emotional understanding levels than their peers in the MoNE. Similarly, Aral et al. (2019) found that children in Montessori schools have higher self-regulation. This significant evidence, once again, reveals the importance of high-quality educational practices that children receive in the early childhood period.

Development and promotion of self-regulation in early childhood can change depending on several factors. Such factors as the child's gender, age, parents' level of education, and parents' age, which also determine the family dynamics, can be considered an essential part of self-regulation development. When the results obtained from the present study concerning children's self-regulation by gender were examined, no difference was found in their attention/impulse control and positive emotion regulations regarding gender. Similarly, Jahromi and Stifter (2008), Fındık-Tanrıbuyurdu (2012); Ertürk-Kara and Gönen (2015); Alejandro et al. (2016); Şamlı (2019); Yılmaz (2020) conducted studies reporting that gender does not change self-regulation performance in children during the preschool period. The results obtained from the study also revealed that gender alone is not a determining factor in children's self-regulation performance.

Another child-related factor is the children's age. It was found in the present study that six-year-old children have higher positive emotions and self-regulation than

four-year-old children. When the related literature is reviewed, it is seen that Astarlar (2019), Eke (2018), and Kurt (2020) report higher self-regulation in children in the six-year-old age group. In addition, they looked into executive function and self-regulation in children. Alarcón-Rubio et al. (2014) mention significant differences between four and seven-year-olds. Self-regulation, which evolves in a developing way from infancy to childhood, is a process of change in which children turn to their interests and regulate their emotional states (Raffaelli et al., 2005). Depending on age, children develop specific skills and abilities necessary for self-regulation, such as expressive and receptive language, motor control, working memory, and cognitive flexibility (Shonkoff & Phillips, 2000). No matter the age level's importance, the duration and degree of change in self-regulation in this period are considered essential for children's short-term and long-term outcomes (Montroy et al., 2016). This result of the research shows the importance of skill development in the early childhood years and emphasizes the support of self-regulation from an early age.

In the mother's and father's age groups, children's mean scores on the positive emotions sub-scale varied between the 21-30-year-old and 41 and over age group, between 21-30-year-old and 36-40-year-old age groups and between 36-40-year-old and 41 and over age group; and this difference is in favor of parents aged 21-30. Family factors serve as antecedents of early childhood experiences and children's self-regulation skills (Xie & Li, 2022). Parents' interaction with children, children's self-care, and family routines influence children's self-regulation development. Since family-related factors help young children regulate their emotions and behaviors better, the finding that young parents' children have higher positive emotions than the other groups is a significant result.

In addition to the child's characteristics, previous studies reveal that children's environment affects their self-regulation development (Blair, 2010; Miech et al., 2001). A particularly remarkable aspect of children's environment that may affect their self-regulation is their mother's level of education. The mother's education level is expected to indicate the differences in children's developing self-regulation (Montroy et al., 2016). The present study found that children's self-regulation did not vary by their mother's and father's level of education. The related literature includes similar study results (Bayındır, 2016; Özbek, 2021). On the other hand, Zeytinoğlu et al. (2017) found that a mother's education was indirectly correlated with children's executive functioning and behavior regulations through its contributions to mothers' emotional support. This finding parallels the idea that mothers' emotional support can be a mechanism that explains the role of a mother's education in the child's self-regulation (Zeytinoğlu et al., 2017). The present study did not deal with any factor that may indirectly affect children's self-regulation. Therefore, it is thought necessary that environmental effects that could have indirect effects are included in future studies evaluating children's self-regulation and family factors.

Implications

Some suggestions could be made based on the results of the study. First, differentiation in children's self-regulation by schools adopting different approaches is the focus of the present study, and expected results have been obtained in this respect. It is recommended that activities that enhance children's self-regulation are actively included in schools where the national curriculum is implemented. To this end, understanding how self-regulation development occurs as well as expected and delayed development (e.g., discovering children's needs concerning their self-regulation mechanisms) would provide teachers with the tools they need for appropriate curriculum arrangements. Thus, early intervention studies can be planned to support children when needed. The development of children's skills and abilities, including their self-regulation in the early period, is possible through high-quality early childhood education and care. Curriculum extension studies must comply with the national curriculum to promote self-regulation development in children. Moreover, the self-regulation development of young children can be examined in the program characteristics aspects expanding the field of study. The study was conducted with three different educational approaches may be a limitation. Comparative studies could be carried out in schools implementing different educational approaches. Thus, curricular practices that are effective in self-regulation development can contribute to the literature. Finally, a more comprehensive study on more than one indicator of a child's environment is seen as the next step to thoroughly understand the characteristics affecting children's self-regulation development within a context.

Code of Ethics

Ethical approval and written permission were obtained from the Ethics Committee of Burdur Mehmet Akif Ersoy University (dated 03.06.2020 and numbered 2020/144).

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Farklı Eğitim Yaklaşımı Uygulayan Okul Öncesi Eğitim Kurumlarına Devam Eden Çocuklarda Öz-düzenleme

Öz

Son yıllarda artan ilgi nedeniyle alternatif eğitim yaklaşımlarını benimseyen anaokullarının sayısında bir artış yaşanmıştır. Araştırmacılar, bu yaklaşımların çocukların gelişimini nasıl etkilediğine odaklanmışlardır. Bu çalışma, nedensel karşılaştırmalı araştırma modelini kullanarak Montessori Anaokulu ile Millî Eğitim Bakanlığı müfredatını uygulayan anaokullarındaki öz-düzenlemeyi karşılaştırmaktadır. Örneklem, Montessori, özel ve devlet anaokullarından oluşan 48-72 ay arası 140 çocuğu içermektedir. Veriler, Kişisel Bilgi Formu ve Anaokulu Öz Düzenleme Değerlendirmesi ile toplanmış ve dikkat, duygu ve davranış düzenlemeyi ölçmektedir. Montessori öğrencileri daha yüksek öz-düzenleme ve olumlu duygu düzenlemesi sergilemiştir. Altı yaşındaki çocuklar dikkat/dürtü kontrolünde daha yüksek puan almıştır. Genç ebeveynlerin çocukları daha yüksek öz-düzenleme seviyelerine sahiptir. Genel olarak, çalışma grubundaki çocukların öz-düzenlemesi yüksektir. Çalışma, bu bulguları mevcut literatür bağlamında tartışmakta ve gelecekteki araştırmalar için pratik öneriler sunmaktadır.

Anahtar Kelimeler: okul öncesi dönem, öz-düzenleme, Montessori okulu, devlet okulu