



RELATIONSHIP BETWEEN MOTOR SKILLS AND SOCIAL SKILLS IN PRESCHOOL CHILDREN

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Abstract:

This study aimed to examine the relationship between motor skills and social skills of preschool children regarding to age, gender, and body mass indexes. A total of 160 typically developing preschool children from the 5 – 6 age groups participated in the study. The families of the children gave consent forms to participate in the study. The Test of Gross Motor Development, 3rd Edition tool (TGMD-III), and Preschool Social Skills Assessment Tool (PSSAT) were used in the study. We performed frequency and percentage analysis for descriptive statistics on the demographic characteristics of the participants. The researchers estimated the minimum, maximum, mean, and standard deviation values of the scales used in the study and the sub-dimensions of these scales. Skewness and kurtosis values for normality and applied Shapiro-Wilk (Normal Fit Test) were examined. We also calculated Cronbach's alpha values for the validity-reliability analysis of the Preschool Social Skills Assessment Tool. The data were analyzed using descriptive statistics and t-tests for gender and age comparisons, and Kruskal-Wallis analyses were employed to examine body mass indexes. We performed Pearson Correlation analysis to determine the relationship between motor skills and social skills. The result of the research showed that the motor skills of preschool children showed a significant difference according to the gender of the children ($p < 0.05$). Preschool children were exposed to a significant difference according to children's ages in terms of locomotor skills and total motor skills ($p < 0.01$). The social skills of these children revealed a statistically significant difference in line with their gender ($p < 0.01$). On the other hand, there was no statistically significant difference according to the age of the children ($p > 0.05$). The body mass index of preschool children's ground motor and social skills did not show a statistically significant difference according to their Body Mass Index (BMI)

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levels ($p>0.05$). Our study could not identify a meaningful relationship between motor skills and the children's social skills ($p>0.05$).

Keywords: motor skills, motor skills' proficiency, basic movement skills, social skills

1. Introduction

Child development is a complex process that combines environmental factors, experiences, and biological characteristics of a child. Lots of scientists have produced many theories about the factors that affect the child development. With the motor development in children, a child begins to gain independence and to adapt to the physical and social environment (Formiga, 2015)

After a baby was born, he or she enters into both motor and perceptual interaction with his or her environment. The source of the tendency that motivates children is the desire to learn (Çamliyer & Çamliyer, 2018). The development of motor skills in children highlights the learning abilities of children. Monitoring motor development in children provides clues to whether the children's development is following typical development. Monitoring children's development does not only provide us with information about the abilities of the child but also may cause changes in the expectations of parents about their children. Undoubtedly, the contribution of families and teachers in the motor development of children is valuable. Because continuous and regular participation of children in activities can lead to movement patterns in the future life of children. A healthy child will be more active throughout his life and be open to improving his motor skills (Stodden et al., 2008). Some studies draw attention to the mighty and significant relationship between motor competence and physical fitness in children (Logan et al., 2011; Morano et al., 2011; Sigmundsson & Haga, 2016).

Although there is a time-dependent process in developing motor skills, this process can be accelerated or limited due to different factors. Motor development is affected by gender roles, independence, autonomy, and cultural expectations (associated with the granting or non-granting opportunities that impact motor development) (Rogoff, 2003). Skills such as running, jumping are the main movement elements in children's daily lives. The advancement of critical movement skills is more based on experience. Multiple structured, or unstructured opportunities are necessary for advanced or active skills. However, the lack of or limited opportunities for movement and experimentation in individuals may negatively affect motor skill performances in early age individuals (Gallahue & Ozmun, 2002).

Motor skills help children use their bodies and learning materials, participate in outdoor activities and play activities, in other words, move fully. It also helps the social and behavioral outcomes that reflect children's self-confidence (Skinner & Piek, 2001). Children who regularly participate in physical activities expand improvement regarding physical, cognitive, and psychological social impact (Çağlak 1999; Strong et al., 2005). Children's regular physical activity and participation of children in a pre-school period not only affect the bone, muscle, and cardiovascular development of children but also

prevent obesity in children (Burrows, 2007; Eastman, 1997; Janz et al., 2004, Sääkslahti et al., 2004; Strickland), 2004; Trost et al., 2003).

While the technology presents inactivity to modern society, it has revealed crucial motor development problems in pre-school children. For this reason, scientists argue that parents should follow the level of physical activity in children at all stages of life. (Certain, 2002; Fowler-Brown & Kahwati, 2004; Fishman, 2001; Gordon-Larsen, 2004; Malina, 2001; Pate et al., 1996; Pate et al., 1999; Reilly et al., 2004). The incompetence of basic movement skills in children makes it difficult for the children to adapt to new movement skills in the future. In other words, the inadequacy of basic movement skills in children can negatively affect their quality of life (Okely et al., 2001). Poor movement skills can lead to social and emotional problems in children as low self-esteem, fear of social rejection, and reduced physical fitness (Piek et al., 2009; Kauner and Roebbers, 2012; Lubans et al., 2010). The appearance of some difficulties in children begins at an early age (Sullivan & Mcgrath, 2003), and it is difficult to separate these difficulties from each other (Hill & Barnett, 2011). These difficulties have long-term effects on people's mental health, academic performance, and career choices (Losse et al., 1991; Hill and Barnett, 2011). Most basic movement skills develop until the age of 8, so studies should be conducted to improve the movement skills at pre-school and primary school ages (Piek et al., 2012).

We aimed to study the relationships between social skills and motor skills of 5-6-year-old children in the study. Children's age, gender, and body mass indexes were the subject of the study. We assumed that the results of this study would help create appropriate strategies for children to gain motor competence and social skills.

2. Materials and methods

The study examined the relationship between the social skills and motor skills of 5-6-year-old children considering the age and gender of each child and the body mass index of the children.

We used a descriptive-analytical research methodology in which one hundred and sixty children participated. Eighty girls and eighty boys from 5-6 years old attending a preschool in Istanbul participated in the research. All the participants consisted of children with physically normal development. We obtained consent forms from the parents of the children participating in the study.

The researchers measured the children's height and weight from demographic characteristics and calculated the children's body mass indexes. Furthermore, we collected the data with the TGMD-III (Ulrich, 2017) tool and the Preschool Social Skills Assessment Tool (PSSAT) (Ömeroğlu et al., 2012). About the results of a study conducted by Ulrich in 2017, the validity and reliability values of the TGMD-3 tool developed by Webster and Ulrich were reasonably high (Ulrich, 2017). And also, the validity and reliability results of the social skills' measurement tool for preschool children developed by Ömeroğlu et al. were in a quite good condition (Ömeroğlu et al., 2014).

We evaluated the age-related evaluation of the Body Mass Index with the Body Mass Index Percentile Values graph developed by Neyzi et al. (2008).

The TGMD-III Test was divided into two subtests. These were locomotor and ball skills. The six tests were used to measure the locomotor through for running, gallop, one-legged jump, bouncing, standing long jump, and gliding. For measuring ball skills, eight tests were used: hitting a fixed ball with two hands, hitting a bouncing ball with one hand, dribbling with one hand while standing, catching a double-handed ball, hitting a stationary ball with a foot, throwing the ball from above and throwing the ball from below.

The PSSAT teacher tool consisted of 49 items and four factors, a 5-point Likert type (1= Seldom 5= Almost Always). The lowest score of this test was 49, besides the highest score was 245. We identified the sub-factors in the scale as initial skills, academic support skills, friendship skills, and emotions management skills. Meanwhile, beginning skills, academic support skills, and emotional management skills contained 12 questions, and friendship skills consisted of 13 questions.

The researchers determined the minimum, maximum, mean, and standard deviation values of the tools and their sub-dimensions. We applied the Skewness and Kurtosis values of the TGMD-III tool and the Preschool Social Skills Assessment Tool and the Shapiro-Wilk (Normal Fit Test) test. For the validity-reliability analysis, we applied T-test for independent samples for comparison by gender and age and Kruskal-Wallis analysis for body mass measurement. Pearson Correlation analysis was performed to determine the direction and severity of children's motor skills, social skills, and sub-dimensions. Data were analyzed through SPSS 22.0 program.

3. Results

The study investigated the relationship between motor skills and social skills of preschool children in terms of their age, gender, and body mass index.

Table 1: Demographic characteristics of the participants

Variable	Group	f	%
Gender	Female	80	50,0
	Male	80	50,0
Age	5 years	80	50,0
	6 years	80	50,0
Weight	Underweight	1	0,5
	Normal weight	127	79,4
	Overweight	18	11,3
	Obese	14	8,8
Height	Short	5	3,1
	Average height	113	70,6
	Tall	32	20,0
Body mass indexes	Very tall	10	6,3
	Underweight	12	7,5
	Normal weight	103	64,4
	Overweight	26	16,3
	Obese	19	11,8

Table 1 illustrates the participants of the children, 50.0% were girls, 50.0% were boys. And also, the study showed that the children's half was five years old, and the other part was six years old. We found that 0.5% of preschool children were underweight, 79.4% were normal weight, 11.3% were overweight, and 8.8% were obese. However, we determined that 3.1% of the children were short, 70.6% had an average height, 20.0% were tall, and 6.3% were very tall. As for the body mass indexes of preschool children, we found that 7.5% were underweight, 64.4% were normal weight, 16.3% were overweight, 11.8% were obese.

Table 2: Comparison of motor skills and sub-dimensions by gender

	Gender	n	\bar{X}	s.s	t	p
Locomotor Skills	Female	80	33,20	6,36	2,160	0,032*
	Male	80	31,09	6,00		
Ball Skills	Female	80	32,54	6,98	-5,706	0,001**
	Male	80	38,36	5,88		
Motor Skills	Female	80	65,74	11,93	-2,070	0,040*
	Male	80	69,45	10,72		

*p<0,01; *p<0,05

The results obtained from the research indicated that the locomotor skills, ball skills, and motor skills of preschool children revealed a significant difference according to their genders (p<0.05). In addition, we found that the arithmetic averages of the locomotor skills of girls were higher than that of boys. However, the results indicated that the boys' ball skills and motor skills were statistically significantly higher than the girls' with 95% confidence.

Table 3: Social skills and sub-dimensions by gender

	Gender	n	\bar{X}	s.s	t	p
Beginner Skills	Female	80	50,24	6,76	4,859	<0,001**
	Male	80	44,28	8,64		
Academic Support Skills	Female	80	49,54	6,39	5,373	<0,001**
	Male	80	43,79	7,13		
Friendship Skills	Female	80	53,68	6,53	4,414	0,001**
	Male	80	48,48	8,27		
Emotion Management Skills	Female	80	46,85	7,64	3,595	0,001**
	Male	80	42,58	7,40		
Social Skills	Female	80	200,30	23,38	5,131	0,001**
	Male	80	179,11	28,59		

**p<0,01

The results stated the preschool children's beginning skills, academic support skills, friendship skills, emotion management skills, and social skills showed a statistically significant difference regarding their gender with 99% reliability (p<0.01).

Table 4: Comparison of motor skills and sub-dimensions by age

	Age	n	\bar{X}	s.s	t	p
Locomotor Skills	5 years	80	30,53	7,05	-3,378	0,001**
	6 years	80	33,76	4,88		
Ball Skills	5 years	80	34,59	7,39	-1,550	0,123
	6 years	80	36,31	6,66		
Motor Skills	5 years	80	65,11	12,47	-2,798	0,006**
	6 years	80	70,08	9,81		

**p<0,01

Preschool children did not show a statistically significant difference in ball skills regarding their age ($p>0.05$). However, children displayed a significant difference in locomotor skills and motor skills referencing the ages of the preschool children ($p<0.01$) with 99% reliability. The research stated that both the locomotor and motor skills of 6-year-old children were higher than 5-year-old children.

Table 5: Comparison of social skills and sub-dimensions by age

	Age	n	\bar{X}	s.d	t	p
Beginner Skills	5 years	80	46,45	8,13	-1,232	0,220
	6 years	80	48,06	8,43		
Academic Support Skills	5 years	80	46,06	7,28	-1,035	0,302
	6 years	80	47,26	7,39		
Friendship Skills	5 years	80	51,08	7,79	-0,097	0,922
	6 years	80	51,08	8,00		
Emotion Management Skills	5 years	80	44,16	8,28	-0,892	0,374
	6 years	80	45,26	7,30		
Social Skills	5 years	80	187,75	28,14	-0,879	0,381
	6 years	80	191,66	28,14		

Table 5 indicates that the results obtained from the research proved that it could not identify a statistically noticeable difference in preschool children's beginning skills, academic support skills, friendship skills, emotion management skills, and social skills ($p>0.05$).

Table 6: Comparison of motor skills and sub-dimensions according to BMI grade levels

	BMI	n	Median	Q1	Q3	χ^2	p
Locomotor Skills	Underweight	12	35	30	36	7,107	0,069
	Normal weight	103	33	29	37		
	Overweight	26	32	27	35		
	Obese	19	29	21	34		
Ball Skills	Underweight	12	41	31	42	2,495	0,476
	Normal weight	103	37	31	40		
	Overweight	26	39	30	40		
	Obese	19	33	30	39		
Motor Skills	Underweight	12	76	61	78	5,844	0,119
	Normal weight	103	70	63	76		
	Overweight	26	70	58	75		
	Obese	19	64	49	72		

There was no statistically substantial difference accordingly pre-school children's locomotor skills, ball skills, and motor skills regarding BMI levels ($p>0.05$).

Table 7: Comparison of social skills and sub-dimensions according to BMI class levels

	BMI	n	Median	Q1	Q3	X^2	p
Beginning Skills	Underweight	12	49	42	56	3,664	0,300
	Normal weight	103	49	44	53		
	Overweight	26	45	39	51		
	Obese	19	49	40	54		
Academic Support Skills	Underweight	12	46	45	50	3,042	0,385
	Normal weight	103	48	43	53		
	Overweight	26	45	37	52		
	Obese	19	45	38	52		
Friendship Skills	Underweight	12	53	48	58	4,166	0,244
	Normal weight	103	53	46	57		
	Overweight	26	49	42	53		
	Obese	19	50	43	57		
Manage Emotions Skills	Underweight	12	49	44	52	4,584	0,205
	Normal weight	103	47	39	50		
	Overweight	26	42	37	50		
	Obese	19	44	36	48		
Social Skills	Underweight	12	195	185	210	4,021	0,259
	Normal weight	103	196	175	213		
	Overweight	26	182	153	202		
	Obese	19	193	166	211		

Preschool children's beginning skills, academic support skills, friendship skills, emotion management skills, and social skills did not differ significantly on the subject of their BMI levels ($p>0.05$).

Table 8: Relationship between motor skills and sub-dimensions and social skills and sub-dimensions

		Beginning Skills	Academic Support Skills	Friendship Skills	Manage Emotions Skills	Social Skills
Locomotor Skills	r	0,143	0,103	0,070	0,169	0,136
	p	0,072	0,194	0,378	0,033*	0,087
Ball Skills	r	-0,161	-0,267	-0,275	-0,088	-0,218
	p	0,042*	0,001**	0,001**	0,270	0,006**
Motor Skills	r	-0,021	-0,108	-0,131	0,038	-0,061
	p	0,790	0,174	0,098	0,632	0,446

** $p<0,01$, * $p<0,05$

The study results pointed out that there was not any relationship between preschool children's motor skills, social skills, and sub-dimensions ($p>0.05$). In addition, there was no significant relationship between locomotor skills and beginning skills, academic support skills, friendship skills, and social skills of the participants ($p>0.05$). However, there was a very weak positive correlation between locomotor skills and their ability to

manage emotions ($p < 0.05$). Furthermore, there was a statistically negative and weak correlation between children's ball skills and initial skills, academic support skills, friendship skills, and social skills ($p < 0.01$). Though, we could not find a significant relationship between ball skills and the ability to manage emotions ($p > 0.05$).

4. Discussion

The research results showed that there was no significant relationship between motor skills and social skills. However, there was a notable gender-related link between motor skills and social skills. In addition, there was a significant correlation between total motor skills and locomotor regarding the age of the children. However, there was no meaningful age-related link in children's social skills. In addition, there was no significant correlation between children's motor skills and social skills, depending on their body mass index.

The research stated that preschool girls' locomotor skills were higher than boys, but boys' ball skills and motor skills were statistically significantly higher than girls'.

Hardy et al. (2009) conducted a study that boys reached proficiency in ball skills and girls in general in locomotor skills.

On the other hand, Cliff et al. (2009) investigated the relationship between physical activity and basic motor skills in preschool children aged 3-5 years, those female participants scored higher than male children in object control and locomotor skill scores. The study results indicated that the socio-economic and socio-cultural structure of the district might have affected the gender differences in the reflection of gender roles on games in early childhood. The social environment may have directed girls to play games such as jumping rope and hopscotch from an early age. Yet society may have led boys to play ball games at an early age. Such a situation may explain the relationship between motor skills and gender. Boys scored higher than girls in motor skills. In other words, from a socio-cultural point of view, the social environment provided boys with more experience opportunities.

The muscle and nerve maturation of boys are less mature than girls. Inevitably, girls' balance skills enable them to be superior to boys (Küçükkaya, 2000). Moreover, the muscle-nerve coordination of girls develops earlier than boys.

The results proved that preschool girls' beginning skills, academic support skills, friendship skills, emotion management skills, and social skills were higher than boys. Elibol-Gültekin's studies (2008) showed that the social skill scores of girls were higher than boys. Elibol and Gültekin confirmed the results of our study results. However, there are some studies that confirm that there is no relationship between children's social skills and the gender factor (Çimen, 2009; Akman et al., 2011).

As children begin to communicate with the environment in the pre-school period, they show similar development from being self-centered to the perspectives of their peers or people around them. While girls play games with their bodies, they tend to play games that reflect social life, such as house games. It may explain why girls get higher scores in social skills than boys. In addition, the fact that families raise their girls with a more

protective attitude in society also supports the super-ego concept of children. It can be a reason that the effects of patriarchal social structure on girls with more prominent gender roles are a factor in their more prominent social development.

In the research findings, both locomotor skills and motor skills of 6-year-old children were higher than 5-year-old children. The results showed that there was no significant difference in the ball skills of the children. As children age, the maturation of sub-systems that are important for motor development plays a vital role in taking children to the next level. It is a fact that as individuals age, their motor skills develop. Motor skill studies involving preschool children confirmed these results (Metem, 2020; Gülaç, 2014; Tepeli, 2007; Boz, 2011)

The results indicated that there was no significant relationship in children's ball skills. It may be due to environmental factors and experiences. School conditions do not have an area to support children's locomotor skills, in-class games, and spending more time with ball materials can explain the relationship with competence in ball skills.

Social skills and social skills sub-dimensions of preschool children did not show a statistically significant difference according to the age of the children.

Yılmaz, Bolat, and Kahveci (2016) concluded in their study that the level of social skills did not differ according to age levels. The studies of Yılmaz et al. were consistent with the results of our research. It could be 5-6-year-old children attending kindergarten have similar qualifications in social skills, considering that they will start primary school a year later.

The study results declared that there was no significant relationship between motor skills and sub-dimensions, social skills, and sub-dimensions in agreement with the BMI variable. Previous studies have verified that excess weight in preschool children adversely affects gross motor development (Logan et al., 2011; Morano et al., 2011). Nevertheless, gross motor skills in children partly affect social and behavioral outcomes that reflect children's self-confidence (Skinner & Piek, 2001). The small sample size and the very close mean values in each group may explain these findings.

The research unveiled that there was no statistically significant correlation between motor skills, social skills, and sub-dimensions of preschool children. There was a weak relationship between preschool children's locomotor skills and their ability to manage emotions. At the same time, there was a poor relationship between children's ball skills and initial skills, academic support skills, friendship skills, and total social skills. The researchers did not find this result significant.

Previous studies have confirmed that there is a relationship between motor skills and social skills in children (Skinner & Piek, 2001; Çağlak, 1999; Strong et al., 2005). These studies are inconsistent with the results of our results. Due to the research, there was no significant relationship found between motor skills and social skills. In early childhood, children do not feel ashamed of their inadequate or faulty performance and also they do not have afraid of being belittled or injured by their peers (Butcher & Eaton, 1989). That may explain the research result.

5. Recommendations

Although the research showed different results from some studies, considering the studies reporting that the BMI factor affects motor skills and social skills (Logan et al., 2011; Morana et al., 2011; Skinner & Piek, 2001), it needs more researches. Therefore, researchers should examine the inconsistency of the findings on the subject. Some hypotheses in the research did not support some studies (Skinner and Piek, 2001; Çağlak, 1999; Strong et al., 2005). Future studies should investigate the causes of disorientation. We applied the motor skill tool and the social skill tool to the children who received pre-school education. Therefore, researchers should utilize the instruments for children who have and cannot receive pre-school education. Thus we can evaluate the results.

In the study, the teachers answered the questions about the social skill instrument for the children, but the children's parents should also answer the same questions for the children. Researchers should evaluate and compare the results.

Since this study coincides with the COVID-19 epidemic period, the research can be done again when the education process is normalized.

Demographic characteristics in the research can be broadened and compared with different schools in socio-cultural and socio-economic terms.

Moreover, future studies can be issued on the role of parental attitudes in the development of children's motor skills and social skills, and the effects of parents' social skill levels on their children.

Researchers can conduct a study on older age groups to examine the effects of motor skill competence and social skills on participation in physical activity and social relations in the future.

Preschools are important social education and training institutions for the physical and social development of children. Therefore, the research revealed that providing early intervention programs and structured learning opportunities in preschools facilitating children's skills development.

6. Conclusion

Results of this study indicate that preschool children's motor skills and social skills showed a significant difference according to the gender of the children. Children's motor skills were substantial according to the age variable, but it was not meaningful in social skills according to age. Children's motor skills and social skills made a significant difference according to the BMI variable. There was also no substantial relationship between the motor skills and social skills of the participating children.

Acknowledgments

Both authors also contributed to the whole work. We wish to express our gratitude to the participants who volunteered for this study.

Conflict of Interest statement

The authors declare that they have no conflict of interest related to the study or preparation of the manuscript.

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