

MOBAK 1-2: GENDER-BASED EVALUATION OF MOTOR COMPETENCE IN 6-8 YEAR-OLD N. MACEDONIAN PRIMARY SCHOOL CHILDREN

DOI: <https://doi.org/10.46733/PESH24131127a>

(Original scientific paper)

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Abstract

Basic motor competencies (BMC) are crucial for enabling children to engage in physical activities and participate in sports, which are important for developing a healthy and active lifestyle. Motor competences are extremely dependent on the specific situational requirements of movement, play and sport. (Herrmann et al, 2015). The purpose of this research is to analyze motor competence in children aged 6 to 8 years from first and second grade between genders. The cross-sectional study was conducted in one primary school from N. Macedonia. In this research, the MOBAK 1-2 instrument was used and adapted for testing and evaluating the basic motor competencies of first and second grade children. Basic motor competencies were assessed with the MOBAK 1-2 (Herrmann, 2018) for 6- to 8-year-old children with standardized equipment. MOBAK 1-2 covers two motor competence areas, object movement (OM) and self-movement (SM), each consisting of 4 motor qualifications. The sample is composed of a total of 110 respondents (boys n = 49, girls n = 61) from first and second grade (age: 6-8 years) during physical education classes. The Mann-Whitney Test was conducted, which examined differences between boys and girls in first and second grade in terms of BMC. Based on the obtained results, it can be concluded that, boys performed significantly better in OM while girls performed better in SM motor competence area. Both, OM and SM qualifications, showed differences between age, indicating that older children achieved higher levels of BMC compared to younger ones. This is consistent with previous research on BMC (Herrmann, 2018) as well as studies on general motor competence, aligning with our expectations. This research among children aged 6-8 has theoretical and practical significance and contributes to the understanding of motor competence and regular physical activity in children and the creation of strategies to promote a healthy and active lifestyle from an early age. The results of the same will make a significant contribution to a broader understanding of the influence of children's lifestyle on their motor development in the key years of childhood.

Key words: *Basic motor competencies, primary school children, MOBAK 1-2, object movement, self-movement.*

Introduction

Basic motor competencies (BMC) are crucial for enabling children to engage in physical activities and participate in sports, which are important for developing a healthy and active lifestyle. The term “motor competence” (MC) is a globally-understood term that describes the level at which children can execute fundamental motor skills. (Haywood & Getchell, 2009). Motor competence refers to an individual's capability to execute various motor skills, where the results are impacted by the quality, control, and coordination of the movements. (Hulteen et al., 2018). Motor competencies are frequently classified into

locomotor skills (e.g., running, jumping, skipping), object control skills (e.g., striking, catching, throwing), and stability skills (e.g., balance). Barnett et al., 2016; Whittehead M., 2010; Colvin et al., 2016).

Physical inactivity among children and adolescents is a worldwide health issue. In 2018, merely 20 to 40% of European children aged 5 to 17 met the WHO guidelines of 60 minutes of moderate to vigorous physical activity (PA) daily (Aubert et al., 2018). Motor competence is closely linked to PA and numerous health indicators, including health-related fitness and weight status (Pill & Harvey, 2019; Valentini et al., 2020). To address the question of "which motor competencies a child should exhibit at a certain age to participate in PE and in sports and exercise culture," the MOBAK 1 test battery was created to evaluate motor competence in primary physical education (Herrmann et al., 2015). Basic motor qualifications are essential elements of physical activities, considered minimal prerequisites for participating in the culture of sports and exercise. These fundamental motor skills provide children with a solid foundation for successful personal development. The performance behaviour, the observable performances of physical action, is what we call basic motor qualifications. They can be formulated as can-do statements (e.g. "can throw", "can catch") and build the foundation for indirectly observable basic motor competencies.

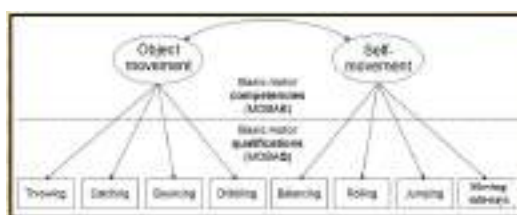


Figure 1. MOBAK Concept – Competency structure model

Material & methods

This study aimed to determine the level of motor competence between boys and girls in 6-8 years old Macedonian primary school children. The cross-sectional study was conducted in one primary school from Macedonia. In this research, the MOBAK 1-2 test instrument (Herrmann, 2018), was used and adapted for testing and evaluating the basic motor competencies of first and second grade children, with standardized equipment.

Participants

The sample is composed of a total of 110 respondents (boys $n = 49$, girls $n = 61$) from first and second grade (age: 6-8 years) from primary school OOU „Gjorgjija Pulevski“– Skopje during physical education classes.

Procedures

All tests were administered during the students' regular Physical Education classes. During the testing process, the classes were divided into small groups of few children and assigned to certified and trained test leaders. These test leaders were either sports scientists, future PE teachers, or sports science students with experience in conducting MOBAK tests. The test subjects had six attempts in the throwing and catching test items, and the point scores in these items were as follows: 0 to 2 hits = 0 points, 3 to 4 hits = 1 point, and 5 to 6 hits = 2 points. For the other test items, each child had two attempts, and the point scores for the given items were as follows: both attempts failed = 0 points, one attempt passed = 1 point and both attempts passed = 2 points (Herrmann, 2018).

Instruments

Basic motor competencies were assessed with the MOBAK1-2 (Herrmann, 2018) for 6- to 8-year-old children with standardized equipment. The psychometric quality criteria for the MOBAK-1-2 have been confirmed several times in various validation studies via confirmatory factor analyses (Herrmann et al., 2015; Herrmann, 2018). The test instrument focuses on a total of eight items covering the two motor competence areas object movement (OM) and self-movement (SM).

MOBAK-areas "object movement" and "self-movement" is calculated as the sum of the results of the 4 motor qualifications test items. A maximum total of 8 points can be achieved for each area (4 test items \times 2 points): object movement= "throwing" + "catching" + "bouncing" + "dribbling"= (max of 8 points)

self-movement = “balancing” + “rolling” + “jumping” + “moving sideways” = (max of 8 points). Max total score: 16 points

Data Analyses

All statistical analyses were performed using the software IBM SPSS Statistics 25. Before all statistical tests, descriptive statistics were calculated as a mean and standard deviation. This test item is dichotomously scaled (0 = failed, 1 = point, 2 = 2 point) and therefore the Mann Whitney (non-parametric) test will be used.

Results

The following presents the outcomes of the "MOBAK 1-2" study, which aimed to assess gender-based variations in motor competence among 6-8 year-old children enrolled in primary schools across North Macedonia.

Based on the results obtained, in relation to gender in first grade, regarding OM area, the test values show that the differences are statistically significant (sig.=.023, Table 1). Boys scored higher in the OM area (mean = 25.50) compared to girls, while girls performed better in the SM area (mean = 23.93).

Table 1. Mann-Whitney Test in relation to gender in first grade for all respondents (boys and girls)

Ranks ^a					Test Statistics ^{a,b}		
	gender	N	Mean Rank	Sum of Ranks		Object movement	Self movement
Object movement	Boys	19	25.50	484.50	Asymp. Sig. (2-tailed)	.023	.087
	Girls	22	17.11	376.50			
	Total	41					
Self movement	Boys	19	17.61	334.50			
	Girls	22	23.93	526.50			
	Total	41					
a. grade = 1st grade					b. Grouping Variable: gender		

The results obtained indicate that, in relation to gender in the second grade, the test values show no statistically significant differences for either the OM area (sig.= .061, Table 2) or the SM area (sig.= .060, Table 2). However, boys scored higher than girls in the OM area (mean = 40.05), whereas girls achieved higher scores in the SM area (mean = 38.95).

Table 2. Mann-Whitney Test in relation to gender in second grade for all respondents (boys and girls)

Ranks ^a					Test Statistics ^{a,b}		
	gender	N	Mean Rank	Sum of Ranks		Object movement	Self movement
Object movement	Boys	30	40.05	1201.50	Asymp. Sig. (2-tailed)	.061	.060
	Girls	39	31.12	1213.50			
	Total	69					
Self movement	Boys	30	29.87	896.00			
	Girls	39	38.95	1519.00			
	Total	69					
a. grade = 2nd grade					b. Grouping Variable: gender		

Table 3. Mann-Whitney Test in relation to gender for all respondents

Ranks					Test Statistics ^a		
	gender	N	Mean Rank	Sum of Ranks		Object movement	Self movement
Object movement	Boys	49	64.85	3177.50	Asymp. Sig. (2-tailed)	.005	.010
	Girls	61	47.99	2927.50			
	Total	110					
Self movement	Boys	49	46.84	2295.00			
	Girls	61	62.46	3810.00			
	Total	110					
a. Grouping Variable: gender							

The results, as presented in Table 3, show that in relation to gender for all respondents, the test values indicate statistically significant differences for both areas: OM (sig.=.005, Table 3) and SM (sig.=.010, Table 3). Once again, boys showed a better score compared to girls in the OM area (mean = 64.85), while girls had a better score in the SM area (mean = 62.46)

In relation to grade for all respondents, regarding the SM area, the test values indicate statistically significant differences (sig.= .000, Table 4), whereas no statistically significant differences were found for the OM area (sig.= .096, Table 4). As observed, respondents from the 2nd grade showed better scores in both competency areas: OM (mean = 59.33) and SM (mean = 63.72)

Table 4. Mann-Whitney Test in relation to grade for all respondents

Ranks					Test Statistics ^a	
	grade	N	Mean Rank	Sum of Ranks	Object movement	Self movement
Object movement	1st grade	41	49.06	2011.50	Asymp. Sig. (2-tailed)	.096
	2nd grade	69	59.33	4093.50		
	Total	110				
Self movement	1st grade	41	41.66	1708.00	.000	
	2nd grade	69	63.72	4397.00		
	Total	110				

a. Grouping Variable: grades

Discussion

The results of this study highlight the importance of acknowledging gender differences in primary physical education. This recognition should extend to the development of teaching strategies tailored to address these differences, thereby supporting children in enhancing their motor skills and overcoming any motor difficulties and delays. Children with lower motor competence are generally less physically active compared to their peers with higher levels of motor competence (Stodden et al., 2008).

Boys tend to excel in object movement skills due to their frequent participation in sports such as soccer, basketball, and handball, along with receiving greater encouragement. Similarly, girls often outperform in self-movement skills, which can be attributed to their involvement in activities like dance and gymnastics (Quitério et al., 2018). Consistent with the literature (Herrmann, 2018), this study showed that age is positively associated with basic motor competence (BMC). Older children have higher BMC scores than younger children in the same age group.

The evidence we presented indicating that boys typically excel in manipulative or object movement skills is consistent with previous findings (Barnett et al., 2010; Ehl, Robertson, & Langendorfer, 2005; Goodway et al., 2010; Hardy et al., 2009; Hume et al., 2008; Okely & Booth, 2004; Thomas et al., 2010; van Beurden et al., 2002). Furthermore, these results align with those obtained by Herrmann et al. (2017) using the MOBAK 1-2 in a German sample of children. In that study, boys performed better in object movement skills, whereas girls achieved better results in locomotor skills.

Conclusions

Childhood, particularly the primary school years, is a critical time for motor development. Encouraging physical activity and motor competence during this stage is essential for fostering a healthy and active lifestyle (Goodway et al., 2019). Our findings align with other significant, and sometimes considerable, gender differences observed in a Macedonian sample. This information is valuable for Macedonian PE teachers as it emphasizes the need for lesson planning that addresses these gender disparities. It can assist in developing pedagogical strategies to help girls improve in skills involving the control of balls and other objects, and boys in skills involving body control.

These findings offer valuable insights for primary school physical education, highlighting the necessity of training teachers to assess motor competence among children and implement targeted intervention strategies for those showing delays. While the MOBAK 1 tests provide useful and relevant tasks for teachers, they lack sufficient stimulation for children and do not offer a diverse and comprehensive motor training context.

To address these needs, additional strategies could include incorporating games that involve throwing and kicking balls or other manipulative tasks for girls and self-movement activities such as dance and gymnastics for boys. Employing a variety of approaches can serve as an effective pedagogical strategy to

address gender differences, foster intrinsic motivation, and create opportunities for specific and process-oriented goals.

Acknowledgements

I would like to express my heartfelt gratitude to the following students from the Faculty for Physical Education, Sports and Health, University “Ss. Cyril and Methodius“, Skopje who dedicated their time and effort to assist with the MOBAK 1-2 testing of the children in this study: Hristijan Smokoski, Bojana Georgievska, Darko Spirovski, Damjan Dimitrijevski, Aleksandar Zlatarov, Sara Minovska, Veljan Velikov, Nikola Babunski, Angela Grozdanovska, Their assistance in conducting the assessments, ensuring consistency, and interacting with the young participants was invaluable. Their commitment to maintaining high standards throughout the testing process significantly contributed to the success of this study.

I would like to extend my sincere appreciation to each student involved for their professionalism, enthusiasm, and unwavering support. Their contributions played a pivotal role in advancing our understanding of motor competence among primary school children.

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