



Cross-Cultural Comparison of Fundamental Movement Skills of Children of Iranian Ethnicities

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(Received 26 Aug 2022; accepted 10 Nov 2022)

Abstract

Background: Cross-cultural studies can provide information on how different cultural contexts, lifestyles, and physical activity play a role in the development of motor skills. We aimed at a cross-cultural comparison of fundamental movement skills of children of Iranian ethnicities.

Methods: The statistical population included boys and girls aged 7 to 9 years from the centers of Tehran (Persian), Lorestan (Lor), Khuzestan (Arab) and Kurdistan (Kurdish) provinces in 2021 year. Overall, 240 people (60 from each province) participated in this research as a sample. Ulric Gross Motor development test (2000) was used to measure the Fundamental Movement skills.

Results: Results of multivariate analysis of variance showed that the main effect of culture (ethnicity) and interaction of culture and gender on Loco motor and object control skills were significant ($P=0/001$). In the total score of fundamental movement skills, the results showed that boys children scored significantly higher than girls ($P=0/001$). Moreover, Lor and Kurdish children significantly performed better than Fars and Arab children ($P=0/001$), but no significant difference was observed between the other ethnicities ($P=0/452$).

Conclusion: Differences in the levels of fundamental movement skills of children of different ethnicities may be due to different physical and cultural activities, attitudes, and motor habits.

Keywords: Culture; Loco motor skills; Object control skills; Physical activity

Introduction

Motor development enables infants to examine their environment and to enhance their cognitive, social, and perceptual development (1). Sufficient motor development is essential for visual-perceptual and cognitive development in childhood. As the movement progresses, infants will be able to grab new objects and move to new

places, increasing their chance of exploring them (2). Childhood motor skills are an important determinant of physical activity and physical fitness in future life. However, children skills levels in many countries are below the optimal levels (3). Society and culture can have a profound impact on children's motor behaviors (4). Sociocultural



factors, such as national origin, can influence future motor development because beliefs and attitudes may encourage (5). According to Sapper (6), "Kipsigs babies in western Kenya (Africa) were exposed to cultural practices that fostered the growth of their gross movements". For example, to encourage vertical sitting, infants were placed in a special hole in the ground designed to help support them. As a result of such cultural practices, Kipsigis culture infants learned to sit earlier than urban white infants in the United States where such sit-ins were not performed. Related studies (7, 8), also reported the slow growth of coarse motor skills among children of Western cultures.

In addition, the migration of different ethnicities to other regions and the presence of their children in schools place a heavy burden on teachers, school officials, and even political officials who deal with people from different cultures in the educational environment. How to behave with any of these children requires a separate philosophy. But these children differ in one important factor, in addition to cognitive factors, language, and thinking, and that is motor development (9). Movement is the key to life and it exists in all aspects of human life. What are most prominent at first glance in child development are the rapid changes in children's movement field (9). As infant goes through childhood, they begin fundamental movement skills (FMS) (10). FMS forms the basis for the development of sports skills, such as building bricks for efficient and effective movements that are a way for the child to explore the environment and gain knowledge of the surrounding world (11). FMS are divided into two major groups, namely loco motor and object control skills, which are the basis of the development of daily life movements so the lack of growth of basic patterns in fundamental movements has direct consequences on one's ability to perform later motor skills (12). In the last few decades, the level of motor skills of primary school children in western countries has been reported (13-16). These findings are of great concern because children with high motor skills achieve positive results in physical activity and weight status. In ad-

dition, motor skills are predictors of levels of physical fitness and motor competence in a future life (17-19). Given these findings, it seems important to investigate and monitor motor behavior in childhood in order to provide appropriate strategies to support the development of children.

One of the factors affecting the development of movement patterns is the culture and environment of the child. In this context, there is a paucity of research comparing children's motor skills across countries or subcultures of each country (19). In this regard, Chow et al (20) compared children's motor skills in China (Hong Kong) and the United States, and differences between groups showed that Chinese children performed significantly better on hand skills and balance tasks, while American children outstripped Chinese children in throwing and catching. Bardid et al (21), in a study, examined cross-cultural comparisons of motor skills in Australian and Belgian children. The results indicated cross-cultural differences should be investigated in all fundamental movements including fine and gross motor skills. Haga et al (22) also showed that in assessing cultural differences in motor competence fine-tuning (brick-placing, brick-making), and gross skills (heel-toe-walking, slope walking), Norwegian children outperformed Italian and Greek children in all tests. Greek children performed significantly better than the Italians in two tasks: placing bricks and heel-to-toe walking. Italian children were significantly faster than the Greek ones in one task: walking/running on slopes. The results of these studies indicate that although genetic influences may play an important role in motor development, the environment plays an important role in complex behaviors such as motor or emotional responses. Therefore, studying the child's environment concerning the prevailing culture can play a significant role in improving motor skills. Cross-cultural research can provide valuable insights into the development of motor skills in different cultural contexts (21). It is important to know the different ethnicities living in a country because on the one hand, the mix of ethnic groups has expanded. On the other hand,

it enables the proper characterization of ethnicities to be appropriately identified and, with this understanding, to develop the best programs for movement patterns (18).

Given that there are different ethnicities in Iran with different cultures, a cross-cultural study of children's movement patterns of these ethnicities can be helpful to present developmental plans and intercultural movement differences in the country to achieve desirable levels of physical activity. In this regard, we examined this question, what is the difference between the fundamental movement skills of children of Iranian ethnic?

Materials and Methods

The present study was a descriptive field survey. The statistical population of this research was formed from all students of elementary schools in Iran with the age range of 7 to 9 years in 2021. Due to the large population size and high cost of the research process, Multi-stage cluster sampling was used to select the sample. By first, randomly selecting four provincial centers including Khorramabad (Lor tribes), Ahvaz (Arab tribes), Tehran (Fars), and Sanandaj (Kurds), and then several blocks were selected in each center, the majority of which were ethnicities. According to the technical aspects of the project into each block, six schools (three boys, three girls) were selected, with six target schools consisting of 2 first-grade elementary schools, 2 second-grade elementary schools, and 2 third-grade elementary schools. Finally, 60 individuals were selected from each ethnicity, out of which 10 were girls, 10 were first-grade boys, 10 were girls, 10 were second-grade boys, 10 were girls, and 10 were third-grade boys. A total of 240 people participated in the study. It should be noted that the selection of blocks was done in the form of non-uniform sampling or improper sampling, and the selection of schools in each block was done systematically. In this study, the participants' information was kept confidential, and the results were published anonymously.

A questionnaire of demographic characteristics, including age, weight, history of illness, Foot, and upper arm of superiority, was used to collect participants' initial information. In addition, Ulrich's (23) gross motor development test, which is one of the valid tools for assessing the development of gross motor skills, was used to measure fundamental movement skills. This test has two subtests of loco motor and object control skills. Loco motor skills subtests include Running, jumping, hopping, galloping, leaping, and sliding. Throwing over the shoulder, catching, kicking, streaking, rolling, and static dribbling are subtests of object control skills. The test gross motor development-2 has two main raw scores related to object control and loco motor subtests. The performance criterion scores of each skill are summed up to obtain the raw score of each skill, then by subtracting the raw score of the skills for each sub-test, the corresponding sub-test raw score is obtained. The maximum raw score for each sub-test is 48. This test was the first report by Ulrich (23) on motor skills, and its validity and reliability for 3-10-year-old American children were 0.096 and 0.087 reported. Moreover, reliability and validity were confirmed by ZareZadeh et al in Iran. Accordingly, the reliability coefficient and internal consistency for the loco motor, object control, and total score were reported as 0.078, 0.074, and 0.080 respectively (24).

The method of implementation was that before the test, the child's superiority of hands and feet, the child's characteristics were recorded in the scoring form. The conditions and performance criteria, according to the instructions, for the implementation of each skill were checked. Before assessing each skill, the task the child had to perform was clearly explained to the child by the examiner and taught according to the instructions. The child made a familiarity trial to make sure to understand what to do. If the task is not understood, explained and shown again. Finally, the child developed the relevant skill in two trials. After each trial, each performance criterion was scored as "one" if done as assigned and "zero" if not done as assigned otherwise. Finally, data were analyzed using appropriate statistical methods. In

this study, multivariate analysis of variance was used to compare loco motor and object control skills in Iranian ethnic children using SPSS software version 24 (IBM Corp., Armonk, NY, USA) at the significant level of 0.05.

Results

The mean and standard deviation of Fundamental movement skills of Iranian children by culture (ethnicity) and gender are presented in (Table 1).

Table 1: Mean and standard deviation of fundamental movement skills of Iranian children according to ethnicity and gender

<i>Variable</i>		<i>Mean ± SD</i>	<i>Mean ± SD</i>	<i>Mean ± SD</i>
Ethnicity	Gender	Loco motor skills	Object control skills	Total FMS
Fars	Boys	23.50 ± 6.04	23.80 ± 7.26	47.30 ± 6.31
	Girls	22.50 ± 6.67	20.30 ± 7.41	42.80 ± 7.03
Lor	Boys	26.13 ± 7.48	25.00 ± 7.67	51.13 ± 8.06
	Girls	24.31 ± 8.02	19.40 ± 7.93	43.71 ± 6.69
Arab	Boys	23.80 ± 6.62	23.23 ± 5.65	47.03 ± 5.65
	Girls	22.71 ± 6.95	17.88 ± 6.25	40.59 ± 6.67
Kurdish	Boys	27.00 ± 8.87	24.86 ± 8.65	51.86 ± 7.71
	Girls	23.03 ± 7.58	22.16 ± 8.34	45.19 ± 8.54

The assumption of normality of data and homogeneity of covariance matrix was tested. To check the normality of the data, the K-S test was used and the normality of the data was accepted at the confidence level of 0.095. In addition, the results of the M box test showed that the assumption of homogeneity of covariances was rejected ($P=0.001$). Therefore, Pillay effect index is reported

The main effect of culture and gender as well as the interaction of culture and gender, were significant ($P=0.001$), means that there was a significant difference between the loco motor components of the girls and boys Iranian children. The results of univariate analysis of variance to compare the loco motor components, which include running, galloping, hopping, leaping, jumping, and sliding among Iranian ethnicity boys and girls, showed the effect of gender and culture interaction on some loco motor components. Galloping ($F=4.30, P=0.001$), hopping ($F=11.13, P=0.001$) and sliding ($F=4.04, P=0.001$), were significant. Accordingly, there was no significant difference between the galloping scores of boys and girls children in Fars ($F=0.20, P=0.892$), Lor ($F=1.25, P=0.290$), and Arab ($F=0.99, P=0.398$) ethnic groups, while this difference was significant in Kurdish ethnicity. Kurdish boys children had significantly higher scores on galloping skills than girls children ($F=13.29, P=0.001$). Regarding hopping, the results showed a significant difference between Fars boys and girls children

($F=19.01, P=0.001$) and Arab children ($F=12.78, P=0.001$). However, this difference was not significant in the Lor and Kurdish ethnic groups. Boys scored significantly higher than girls on hopping skills ($P=0.001$). Moreover, in the slide component, the results showed a significant difference between Arab boys and girls children ($F=13.64, P=0.001$). The difference was, however, not significant in Fars, Lor, and Kurdish ethnicity. Arab boys' children scored significantly higher than girl's children on sliding skills ($P=0.001$) (Table 2). The main effect of culture and gender as well as the interaction of culture and gender were significant ($P=0.001$), meaning that there was a significant difference between the components of object control skills in girls and boys children of Iranian ethnicity. The results of univariate analysis of variance in order to compare the components of object control skills of boys and girls children of Iranian ethnicity showed that the effect of interaction of two gender and culture variables was significant only in the component of rolling ($F=14.71, P=0.001$).

Table 2: The results of the multivariate variance test to compare the loco motor skills of Iranian ethnic children

<i>Effect</i>	<i>Pillai's trace value</i>	<i>df</i>	<i>F</i>	<i>Sig</i>	<i>η²</i>
Ethnicity (culture)	0.372	3	5.39*	0.001	0.124
Gender	0.152	1	6.76*	0.001	0.152
Ethnicity (Culture)* Gender	0.229	3	4.22*	0.001	0.101

There was a significant difference between the score of the rolling component of Lor ($F=11.83, P=0.001$) and Arab ($F=5.91, P=0.001$) boys and girls children, But this difference was not significant in Fars ($F=2.21, P=0.177$) and

Kurdish ($F=0.155, P=0.695$) children. Lor and Arab boys children had significantly higher scores on rolling skills than girls children ($P=0.001$) (Table 3).

Table 3: The results of the multivariate variance test to compare the object control skills of Iranian ethnic children

<i>Effect</i>	<i>Pillai's trace value</i>	<i>df</i>	<i>F</i>	<i>Sig</i>	<i>η²</i>
Ethnicity (culture)	0.305	3	4.319*	0.001	0.206
Gender	0.206	1	9.839*	0.001	0.102
Ethnicity (Culture)* Gender	0.203	3	2.775*	0.001	0.068

The main effect of Ethnic ($P=0.004$) and gender ($P=0.001$) was significant, but the effect of ethnic and gender interaction was not significant ($P=0.973$). Bonferroni post hoc test on the main effect of gender showed that boys children scored significantly higher than girls children on fundamental movement skills ($P=0.001$). Regard-

ing the main effect of ethnicity, the score of Fundamental movement skills of Lor and Kurdish children was significantly higher than that of Arab and Fars children ($P=0.001$), however, no difference was observed between other ethnic groups ($P=0.452$) (Table 4).

Table 4: Results of the two-way analysis of variance in order to compare the total score of Fundamental movement skills of Iranian boys and girls children

<i>Effects</i>	<i>Total square</i>	<i>Degree of freedom</i>	<i>Mean square</i>	<i>F</i>	<i>Sig</i>	<i>η²</i>
Ethnicity (culture)	891.712	3	297.237	4.361*	0.004	0.053
Gender	3117.304	1	3117.304	54.744*	0.001	0.165
Ethnicity (Culture)* Gender	15.546	3	5.182	0.076	0.973	0.001

Discussion

The purpose of this study was a cross-cultural comparison of fundamental movement skills of children of Iranian ethnicities. In this regard, the results of the present study showed that the main effect of ethnicity and gender as well as the inter-

action of ethnicity and gender in loco motor, object control skills, and the total score of fundamental movement skills of ethnic children Iranian was significant. The results of this part of the study are in line with other results (20-22).

Chow et al (20) compared children's motor skills in China (Hong Kong) and the United States, and

differences between groups showed that Chinese children performed significantly better on hand skills and balance tasks, whereas children did. The Americans outstripped the Chinese children in throwing and catching. Bardid et al (21) also examined cross-cultural comparisons of motor skills in Australian and Belgian children. The results showed that cultural differences have a significant influence on children's movement patterns. Haga et al (22) evaluated aspects of motor competence among children from different cultural backgrounds. The results showed that Norwegian children performed better than Italian and Greek children. The results of these studies are consistent with those of the present study as they show the impact of cultural and socio-cultural context on motor development. These cultural differences provide insights into different cultural practices that help or hinder the development of certain types of skills.

The findings of this study showed that in the total score of FMS, Lor and Kurdish children performed significantly better than Arab and Fars children. In line with the results of this part of the research, we can refer to the results of the study by Tahmasabi et al. (25). In this research, in loco motor skills, seven to nine-year-old children living in Khorramabad and Sanandaj performed better than children living in Tehran and Ahvaz. These results may be indicative of the specificity of motor skill learning (26, 27) in which special motor experience training including different motor assignments, improves motor performance in specific skills. Accordingly, according to dynamic systems theory, the development of motor competence is enhanced by a specific environmental context that includes physical activity (18, 28). Thus, differences in motor skills among children of ethnic groups may be explained by factors such as differences in the type and amount of time spent on different physical activities and motor experiences, space and equipment, and families' attitudes to physical activity. In addition, among the possible reasons for the results of this part of the research, we can point to the more activity and space of children in the cities of Sanandaj and Khorramabad compared to the cit-

ies of Ahvaz and Tehran. Today, the environmental conditions and technology-oriented in the metropolises have led to children's inactivity.

Concerning gender differences, male children had significantly higher scores on FMS than female children. Kurdish boys also scored higher on galloping skills than female children. Concerning the jumping component, the results showed that the male children of Fars gained more points than the female children. In the slide component, the results showed that Arab male children had significantly higher scores than female children. Discussions about gender differences in motor skills were not matched. There was no gender difference in hand agility in children between 9 and 12 years of age (29, 30). Another report indicated gender differences for girls at age 4 and boys at age 17 (29). It is probably argued that some activities and sports lack gender-specific relationships and relationships (11). There was a slight difference between the motor skills of girls and boys in Norway, which was correlated with boys' superiority (30). These results are consistent with the present study. In addition, Jung Lin et al. (31), in a study examined the differences in FMS in children from 6 to 9 years old. The results showed that there was a significant difference in overall object control skills, and overall performance and boys performed better than girls in both object control and overall performance skills. These results are consistent with the present study. It is therefore desirable for elementary school teachers to encourage girls to participate in a variety of games, as well as to encourage them to run, throw, and dribble after school.

In brief, schools should provide students with a variety of fun activities and encourage them to participate in after-school and out-of-school sports to develop FMS because the growth of FMS is essential for mastering the sports and games of a culture. FMS is an efficient movement like building bricks that provide a child with a way to explore the environment and gain knowledge about the world around them. A developed FMS can be considered synonymous with learning words or letters of the alphabet. These letters serve as the basis for learning words

(combinatorial motor skills), whereby the child can make sentences and paragraphs by using words in different combinations (using special sports skills). If a basic understanding of words or letters is not created, the child will be disrupted in their language development. Similarly, in motor development, the ability to move smoothly across multiple components of the FMS is impaired when the child does not achieve the necessary motor competence in the early years. In general, various factors affect motor development such as the number of children in the family, social relations and type of nutrition, the level of education, which were not considered in this study.

Therefore, in order to gain a deeper insight into the factors affecting the difference in FMS of children of Iranian ethnic groups, it is suggested to investigate multiple factors affecting motor development in these areas in future studies.

Conclusion

The data shows the existence of differences between the motor skills of children of different ethnic groups in the country. We propose that having a cultural attitude toward moving and planning the relevant indicators in schools, and applying physical activity experiences, has a major impact on the perfection and development of children's motor skills.

Ethics Journalism considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Acknowledgements

The authors appreciate all the directors, assistants, and students who helped us by participating in this research. This research was financially

supported by the Iranian Researcher Support Fund.

Conflicts of Interest

The authors declare that there is no conflict of interest.

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