The Relationship between Motor Proficiency and Level of Contribution in Physical Activity in 13 and 14 year old Females Students in Tehran

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ABSTRACT: The following research is an attempt to determine the possible relationship between female 13 and 14-year-old students’ motor proficiency and the amount of their participations in physical activities in the capital of Iran, Tehran. This is a descriptive and correlational study. The overall population of Tehranian female students within the age range of 13 to 14-comsisted of 93108 students from which 384 were selected as the final sampled population through stratified random sampling. The acquired data were analyzed by the Spearman correlation coefficient and logistic regression with the significance level assigned as p<0.05. The results of the analyses showed that there existed a positive significant correlation between the fine motor skills and the amount of participation in physical activities (p=0.001), and also a positive significant correlation between the gross motor skills and the amount of participation (p=0.034); however, there was not any significant relationships between the fine/gross motor skills and the amount of students’ participations in physical activities (p=0.908). In the same vein, the results of regression analysis revealed that although the two sub-measures of fine and gross motor skills have been regarded as the best predictive measures for the amount of participation in the literature, the obtained results of this study showed that these two measures could not be a valid tool to predict the amount of students’ participation in physical activities.

Keywords: Motor proficiency, Gross motor skills, Fine motor skills, Bruininks-Oseretsky Test.

INTRODUCTION

The motor proficiency belongs to the inherent genetic abilities that are not affected by exercise and environment. This skill is regarded as one important factor which affects the children’s and teenagers’ amount of physical activities and is the basis of later adulthood skills (Wrotniak, 2006). In the 21th century, the change in people’s life styles has made them less active due to living in apartments and playing computer games, especially as far as children and teenagers are concerned, and eventually lead to some extra physical and motor problems (Bakhtiyari, 2009). Such problems in children in turn might result in behavioral and learning problems. While most of these motor problems in children could be diagnosed and modified early enough when engaging in physical activities, most of them go unnoticed by parents and teachers and consequently nothing is done to modify them. On the other hand, it is possible that some children with inherent physical skills are ignored by teachers and not enough attention is paid to their levels of participation in physical activities. These children could face some problems in coordination while learning new motor skills and have a weaker and slower performance in the learned new skills as compared to their peers. Knowing about the process of motor growth in children helps us to diagnose abnormal characteristics so as to intervene and cure such abnormalities. Most of the children engage in less physical activities than it is thought they do, and as they attain age, the level of their physical activity diminishes or stagnates. Through identifying children’s motor abilities, the motor growth experts are able to design physical exercises in which stronger abilities are emphasized so that those weaker ones are made up (Shojaei, 2006a). If we identify individual physical differences among children, we can predict more successfully their future achievements and their latent physical talents and guide them into the appropriate channel of education so that their talent is not wasted in another area of education which they are not innately good at. Two seminal pieces of research in Iran conducted on students’ motor proficiency show that the motor performance in Tehranian male middle schoolers is mediocre in all motor skill’s sub-tests of fine, fine/gross, and gross. Along the same line, female students’ performances were under mediocre level for the fine sub-
tests, mediocre for the fine/gross sub-tests, and upper mediocre for the gross sub-tests. The results of study (Bakhtiyari, 2009) revealed that the standard scores of Tehranian 6 and 7-year old girls for the fine motor skills were lower than mediocre level and their scores for the gross motor skills were also under mediocre level. They also compared their obtained results with three cities of New York, Sidney and Beijing, finding that girls living in New York had a better performance in the fine/gross motor skills across all four above mentioned cities (Shojaei, 2006b). The overall results pinpoint the fact that Iranian girls are not in a proper situation as far as motor proficiency are concerned-especially in terms of the gross motor skills. Unfortunately, not even a single piece of research has yet been carried out in Iran to delve into the possible existing relations between the motor proficiency and the amount of students’ participation in physical activities. Internationally speaking, there is also only one study in the literature that has investigated such a relationship (Schmidt, 1941).

In 2006, Wrotniak et al (2006) conducted research into the relationship between children’s’ motor proficiency and their physical activities, the results of which showed that children’s motor proficiency enjoy a significant positive correlation with the amounts of and the time spent for their gross physical activities, but a negative correlation with the time they do not engage in physical activities and their fine skills. They also found that children with the highest rank in the quarter of motor proficiency ranking scale involved more in physical activities than those who were in lowest ranks in the scale. Therefore, in the following study, the researcher tries to determine the possible relationship between motor proficiency and the level of participation in physical activities in Tehranian 13 and 14-year-old female students. In other words, the researcher wants to shed some light on the issue that whether motor proficiency, as a type of genetic inherent abilities, could make students involve more attentively in physical activities or not, and whether all those students who scored high in the motor proficiency tests enjoy the possible required opportunities to attend physical activities and exercises at schools or not? The obtained results could help teacher and curriculum developers to find an appropriate measure to evaluate students’ motor abilities and their amounts of participation in physical activities so that the schools’ educational syllabuses and the ways talents are diagnosed are improved.

MATERIALS AND METHODS

Participants

The overall population of Tehranian female students within the age range of 13 to 14 years old (second and third grade middle schools) consisted of 93108 students. The selected population for this study comprised of 384 students which were selected through stratified random sampling based on Morgan’s sampling table.

Instruments

The instrument employed in this study is Bruininks-Oseretsky Test of Motor Proficiency (BOTMP) that was standardized by Bruiniks (1978) while used on 765 students based on their genders, ethnicities, sample size and their geographical areas in 1970. This test enjoys the reliability index of 0.87. This test battery is standard referenced and evaluates the motor performance of children who are 4.5 years old to 14.5 years old. The main test battery consists of 8 sub-tests (including 46 different experiments) that evaluate the motor proficiency or motor disorders in the gross motor skills, fine/gross motor skills and fine motor skills. It takes 45 to 60 minutes for participants to take the whole parts of the test: 4 sub-tests measure gross motor skills, 3 measure fine motor skills, and 1 measures gross/fine motor skills.

Procedure

First off, the researcher referred in person to the Iranian Ministry of Education to attain the complete list of girls’ middle schools in Tehran. After selecting 8 different schools in random fashion, the researcher obtained the required permissions (from principals and physical education teachers) to attend the students’ classes, provided them with the overall picture of the research goals, and selected the participating students randomly. Later, the researcher distributed the bio-data and physical activity questionnaire to the subjects. After the questionnaires were filled in by students, they were gathered and analyzed so that only those students who belonged to the required age range were finally included in the testing tasks. Eventually, with the permission of their parents, 384 students were selected and regarded as the final population of the research. Four testers as assistants and 1 as supervisor (the researcher) conducted the measurements; they were informed with the details two weeks before the tests started. For each of the sub-tests, 1 particular tester was assigned to test all the subjects in a way that maximum validity of students’ records was observed. In order to block any possible chance of participating students’ getting tired, the tests were conducted in various times. Before starting the main sub-tests, students were to attend a hand/leg pre-test. After that, following a clear time table in which students did not become physically and mentally tired, the main sub-tests were taken. Each tester was supposed to do 12 experiments for each of the sub-tests.
**Data analysis**

To tabulate the data, descriptive statistics of mean and standard deviation were employed in this study. To draw graphs, the Excel software (2007) was used. Finally, inferential statistics were employed to measure the level of correlation coefficient and logistic regression. All the data were descriptively and inferentially analyzed by SPSS software (version 16) with the assigned significance level of 0.05.

**RESULTS**

After getting assured of the normality of the distribution of the data by Kolmogrov-Smirnove test, the data were analyzed by Spearman correlation test and logistic regression analysis.

**Table 1. The descriptive statistics for skills based on the amount of participation in physical activities.**

<table>
<thead>
<tr>
<th>Bruininks-Oseretksys sub tests</th>
<th>amount of participation in physical activities</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Motor Proficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>physical activities in schools</td>
<td>249</td>
<td>153.9317</td>
<td>12.98694</td>
</tr>
<tr>
<td></td>
<td>regular physical activity</td>
<td>135</td>
<td>158.1866</td>
<td>12.15326</td>
</tr>
<tr>
<td></td>
<td>Fine Motor Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>physical activities in schools</td>
<td>249</td>
<td>50.8233</td>
<td>6.64000</td>
</tr>
<tr>
<td></td>
<td>regular physical activity</td>
<td>135</td>
<td>53.1045</td>
<td>6.17206</td>
</tr>
<tr>
<td></td>
<td>Gross Motor Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>physical activities in schools</td>
<td>249</td>
<td>85.3815</td>
<td>9.13226</td>
</tr>
<tr>
<td></td>
<td>regular physical activity</td>
<td>135</td>
<td>87.6269</td>
<td>8.99931</td>
</tr>
<tr>
<td></td>
<td>Gross/Fine Motor Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>physical activities in schools</td>
<td>249</td>
<td>17.7269</td>
<td>1.69133</td>
</tr>
<tr>
<td></td>
<td>regular physical activity</td>
<td>135</td>
<td>17.4552</td>
<td>2.52094</td>
</tr>
</tbody>
</table>

As you can see in table 1, the mean of the motor skills, the fine motor skills and the gross motor skills in the level of regular physical activity is more than the level of physical activities in schools, but it is not the case in the weak/strong motor skills and the mean of the weak/strong motor skill of students who engaged in schools’ physical activities was higher than those who had regular physical activities.

**Table 2. The Spearman correlation coefficient for motor skills variables and the amounts of participation.**

<table>
<thead>
<tr>
<th>Bruininks-Oseretksys sub tests</th>
<th>fine/gross motor skills and the amount of participation in physical activities</th>
<th>N</th>
<th>Spearman correlation coefficient</th>
<th>0.006</th>
<th>0.108</th>
<th>0.173</th>
<th>0.154</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>gross motor skills variables and the amounts of participation</td>
<td></td>
<td>probability amount</td>
<td>0.908</td>
<td>0.034</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>fine motor skills variables and the amounts of participation</td>
<td></td>
<td>Number</td>
<td>384</td>
<td>384</td>
<td>384</td>
<td>384</td>
</tr>
</tbody>
</table>

As shown in table 2, the Spearman correlation coefficient for motor proficiency variables and the amounts of participation was 0.154 and the probability amount of Spearman correlation coefficient was 0.003, therefore, at the significance level of 0.05 the coefficient is significant and given the positive correlation coefficient, the correlation is positive.

The Spearman correlation coefficient for fine motor skills variables and the amounts of participation was 0.173 and the probability amount of Spearman correlation coefficient was 0.001, therefore, at the significance level of 0.05 the coefficient is significant and given the positive correlation coefficient, the correlation is positive. The Spearman correlation coefficient for gross motor skills variables and the amounts of participation was 0.108 and the probability amount of Spearman correlation coefficient was 0.034, therefore, at the significance level of 0.05 the coefficient is significant and given the positive correlation coefficient, the correlation is positive.

The probability amount of the Spearman correlation coefficient was 0.908 for the fine/gross motor skills and the amount of participation in physical activities. Therefore, in the significant level of 0.05, the correlation is not significant between fine/gross motor skills and the amount of participation, hence no significant correlation exists between the two variables.
As shown in Table 3, those students who obtained higher scores in the gross motor skills test engaged frequently in physical activities; this in turn proves that there exists a significant relationship between the amount of students’ participation in physical activities and strong motor skills.

As shown in Table 4, those students who obtained higher scores in the fine motor skills test engaged frequently in physical activities; this in turn proves that there exists a significant relationship between the amount of students’ participation in physical activities and fine motor skills.

Table 5 shows that those students who obtained higher scores in the fine/gross motor skills test didn’t engage frequently in physical activities, proving that there is not any significant relationship between the amount of students’ participation in physical activities and the obtained scores in the fine/gross motor skills test. In general, the results of logistic regression revealed that the two sub-measures of gross motor skills and the fine motor skills could not be regarded as a valid measure for predicting students’ amount of participation in physical activities, quite the contrary of what has been claimed in the literature.

**DISCUSSION AND CONCLUSION**

The results revealed that no significant positive relationship was observed between the fine/gross motor skills and the amount of students’ participation in physical activities; as a result, among three sub-measures of Bruininks-Oseretsky test of motor proficiency, those students who achieved higher scores in gross motor skills test and fine motor skills test frequently engaged in physical activities, while no such a relationship was observed between the obtained scores from fine/gross motor skills and the amount of participation in physical activities. The overall conclusion proves the existence of a positive meaningful relationship between motor skills and the amount of participation in physical activities.

Ridgway’s study (2009) showed that there is a positive correlation between children’s motor growth and the advancement in the physical education’s level of schools. In the same vein, Barnett (2009) believed that children’s motor ability significantly affects their motor skills, physical abilities and physical exercises in future. In another study, Wrotniak (2006) stated that the motor skills in children, while doing medium to extreme physical activities, has a significant positive relationship with strong motor skills but a significant negative relationship with weak and sedentary physical activities. He further asserts that according to his findings, those children who scored higher in the motor skills test participated more in physical activities as compared to those who gained lower scores in the motor skills test. There were also a positive significant relationship observed between strong motor skills and the amount of students’ participation in physical activities.

The concluding results of logistic regression revealed that the two sub-measures of the gross motor skills and the fine motor skills are regarded as the best predictors of the amount of students’ participation in physical activities, while the results of obtained scores in the fine/gross motor skills test are not a valid index for predicting the amount of students’ participation. Consequently, it is highly suggested that physical education teachers, relying on the obtained scores of motor skills test, encourage students to participate in physical activities and exercises early at school. They should also pay attention to the reasons why those students who score high in such tests do not attend physical activities as they are supposed to, so that they are made to participate in extra curriculum activities and sports.

Given the physical educational curriculums of schools, no independent syllabuses are designed in schools for fine/gross motor skills. This proves an urgent need to revise the overall syllabuses of physical education courses at Iranian schools so as to encourage students to participate more in physical activities and exercises at schools. As an example, one way
to encourage students to do physical exercise is design dancing courses for them which belong to the fine/gross side of motor skills activities. The obtained results of this study are on a par with those of Farsi and Rober (2011) and given the age range of participating students in this research we can attribute the discrepancy between this very research’s findings and those of Beard to the maladroitness period in teenagers emphasized in this study.

REFERENCES

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