Abstract

The aim of our research was to determine the pre-existing knowledge of gymnastics and the change in opinions of female students about gymnastics after a 30-hour course at the Faculty of Sport.

We enrolled all 74 female students of the first study year in the school year 2002/2003. They answered the questionnaire with questions about students' acrobatic knowledge and about student's opinion about acrobatics. The answers were graded with a 5-point Likert scale and questionnaire was used before and after the acrobatic course. For each variable we used a paired samples t-test statistics.

Results showed a very low preexisting knowledge of acrobatic elements originating from primary and secondary school; however the starting opinions about acrobatics were in average moderately positive. After the course most of the opinions about acrobatics changed significantly in the positive sense. Students after the course regard acrobatics to be important for human development and therefore a necessary part of elementary and secondary school curriculum.

Key words: gymnastics, physical education, questionnaire, prospective, study

Introduction

Basic aim of the university program at the Faculty of Sport in Slovenia is to educate physical education (PE) teachers. However especially in the field of sport gymnastics, we cannot be satisfied with student's performance, as a lot of students do not pass from the 1st year to the 2nd. One of the obligatory courses of the 1st year study program is the Theory and Methodic of Artistic Gymnastics, which consists of acrobatics and apparatus gymnastics. This course comprises 105 hours; 30 hours of theoretical lectures (history, biomechanics, methodology, apparatus, judging) and 75 hours of practical lectures (30 hours of acrobatics and 45 hours of apparatus gymnastics). In the last years we repeatedly noticed insufficient pre-existing acrobatic knowledge of students starting the gymnastics course and most of them have problems to cope with the material, which is similar to reports also from other countries (Bučar, 2003; Sloan, 2007). Gymnastics and acrobatics are basic sport skills which can be used in different forms at competitive, recreational and regenerative levels of other sport disciplines (Bolkovič & Kristan 1998). Therefore the mastered level of skill and knowledge of PE students at the course of gymnastics is of significant importance for the proper performance of PE teachers in general.

The Slovenian curriculum of PE in elementary and secondary schools comprises in significant part also gymnastic and acrobatic elements (Kovač et al., 1994; Kovač & Novak, 1998). Since we know from previous research that the Faculty of Sport students have higher level of motor abilities compared to normal population (Strel et al., 2003), we could therefore expect to find a good theoretical and practical knowledge of acrobatic elements of the students at the start of faculty gymnastics course. However, Tome (1983) found that the content of the curriculum from gymnastics – acrobatics was poorly executed in primary and
secondary schools. He performed a survey in the students of the Faculty of Sport whether they had been learning rolls, handstand and handspring. His findings showed that in primary school pupils gained more experience with acrobatics than in secondary school: results from primary school: 91,2% were learning rolls, 68,9% were learning handstand and 61,8% were learning handspring; results from secondary school: 69,7% were learning rolls, 64,1% were learning handstand and 53,8% were learning handspring. So the rationale behind our investigation was to evaluate the current status of preparation of the students at the start of the gymnastics course, to see if there was a progress made in the preparation of the first year students for our course in the last twenty years and to evaluate the impact of our course on their opinions about acrobatics. These opinions are regarded to significantly impact on the level of execution of gymnastics and acrobatics later on, when the students will become PE teachers in Slovenia.

Therefore the first aim of our investigation was to determine how well were the acrobatic elements introduced to the students at the previous grades of education (primary and secondary school). The second aim of our investigation was to determine the opinions of students about the impact of acrobatics on the human development before the faculty acrobatic course and afterwards.

Methods

Subjects

All first year female students (n=74) of the school year 2002/2003 participated in the study. Their average age was 19,5±1,4 years, their weight was 60±6,1 kg and body mass index was 21,5±2,6. All subjects gave their written informed consent to participate in the study. The study was approved by the local Ethics committee.

Study protocol

The data acquisition was performed at the Faculty of Sports, University of Ljubljana at the beginning and after the 30-hour program of acrobatics. This program was performed in the period from October till December, three times per week, each class lasting 45 minutes. During this course the participants were trained to master basic acrobatic elements such as roll forward and backward, cartwheels, handstand, round-off, round-in, dive roll, handsprings forward and backward, etc. These elements were selected to enhance body control and perception (Čuk et al., 2006).

Instruments

The answers of students were gathered using a questionnaire, which was tested in the pilot study regarding the clarity and the ease of understanding. The questions were examining which acrobatic elements were parts of their PE in primary school, secondary school or from some other source of organized physical activity (e.g. gymnastics clubs, while training their sport e.t.c.) with answers yes/no. These questions were used only at the beginning of the acrobatic course.

The second part of the questionnaire was designed to evaluate acrobatic program from different perspectives, which were: (i) the general importance of acrobatics in elementary and secondary school curriculum, (ii) the importance of theoretical knowledge of acrobatics for practical execution, (iii) the aspect of fear, (iv) the importance of acrobatics for development of personal characteristics, (v) the impact of acrobatics on human psychosocial, physical and motor development. These answers were graded using Likert scale of 5 points, with a typical
format where 1 represents a complete disagreement and 5 represents a strong agreement. Students answered the same questions two times: before acrobatic course and after it.

Statistical analysis

The data is presented as the mean ± standard error or using the frequencies. Paired samples t-test was used to compare the Likert scores. The statistical analysis was performed with the program SPSS for Windows (SPSS Inc., Chicago, Illinois, USA).

Results

The percentage of positive answers regarding the acquaintance of students with the acrobatic elements before entering the Faculty of Sports is presented in Figure 1. For most elements the acquaintance is near or below 50%.

![Figure 1. Acrobatic elements which have been though in primary and secondary school and out of school. N – number of sample, C – Cartwheel, HRF – Handstand to roll forward, BH – roll backward to handstand, RO – round off, RI – round in, DR – dive roll, HF – handspring forward, HB – handspring backward](image)

The results of the second part of the questionnaire with the students’ evaluation of selected opinions about acrobatics are displayed in Table 1.
Table 1. Opinions about acrobatics graded with a 5-point Likert scale. Average grades are shown at the start and after the 30-hour acrobatic course. N – number of subjects, M – average, SE – standard error, p – probability of a paired samples t-test value.

<table>
<thead>
<tr>
<th>Statements about acrobatic</th>
<th>October 2002</th>
<th>December 2002</th>
<th>p(t-test)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SE</td>
<td>M</td>
</tr>
<tr>
<td>It is important in Curriculum for primary school.</td>
<td>3,33</td>
<td>0,143</td>
<td>4,14</td>
</tr>
<tr>
<td>It is important in Curriculum for secondary school.</td>
<td>3,11</td>
<td>0,133</td>
<td>3,79</td>
</tr>
<tr>
<td>Theoretical knowledge is important for practice performance.</td>
<td>3,79</td>
<td>0,109</td>
<td>3,86</td>
</tr>
<tr>
<td>I'm afraid to do acrobatic elements.</td>
<td>2,80</td>
<td>0,160</td>
<td>2,11</td>
</tr>
<tr>
<td>It develops space orientation.</td>
<td>4,20</td>
<td>0,101</td>
<td>4,46</td>
</tr>
<tr>
<td>It develops interpersonal help.</td>
<td>3,61</td>
<td>0,116</td>
<td>4,13</td>
</tr>
<tr>
<td>It develops persistence.</td>
<td>3,94</td>
<td>0,102</td>
<td>4,20</td>
</tr>
<tr>
<td>It develops working habits.</td>
<td>3,91</td>
<td>0,115</td>
<td>4,26</td>
</tr>
<tr>
<td>It develops determination.</td>
<td>4,06</td>
<td>0,109</td>
<td>4,26</td>
</tr>
<tr>
<td>It develops creativity.</td>
<td>3,20</td>
<td>0,120</td>
<td>3,26</td>
</tr>
<tr>
<td>It influences body posture.</td>
<td>3,76</td>
<td>0,123</td>
<td>3,94</td>
</tr>
<tr>
<td>It is positive for child biopsychosocial development.</td>
<td>3,51</td>
<td>0,138</td>
<td>3,81</td>
</tr>
<tr>
<td>It is important for physical development.</td>
<td>3,60</td>
<td>0,123</td>
<td>3,94</td>
</tr>
<tr>
<td>It is important for motor development.</td>
<td>4,44</td>
<td>0,080</td>
<td>4,59</td>
</tr>
</tbody>
</table>

Discussion

With this study we tried to analyze the factors of insufficient student performance in the course of gymnastics and acrobatics at the Faculty of Sport. Our main finding is a relatively low acquaintance with acrobatic elements which were supposed to be mastered at the lower levels of education before entering the Faculty of Sport. Despite that we surprisingly found in average rather positive opinions about acrobatics with most of grades becoming even significantly higher after the 30-hour acrobatic program at our faculty.

According to results shown in Figure 1, we can see that pupils in primary school and secondary school have approximately similar realization of a PE curriculum. Most frequently performed elements on both levels of education are handstand to roll forward, dive role and cartwheel. Some knowledge about more complex elements was gained at the out of school activities. The worrying fact is that many schools did not fulfill their tasks according to the official document of PE curriculum. For basic elements like cartwheel and handstand there are no special conditions needed, but comparing to the report of Tome (1983), gymnastics twenty years later is even less present in schools and the acquaintance of students entering the Faculty of Sport, worse.

An interesting finding that we noticed during the course was that for cartwheel they did not understand official terminology. They could perform cartwheel but they did not know official name of the element in Slovene language. We noticed during the course that also with other elements students had problems to understand official gymnastic terminology; they used slang words instead. It is obvious from these observations that they did not use the proper terminology practicing PE in elementary and secondary schools.

It is a positive finding that, according to results presented in Figure 1, there is a substantial part of the gymnastic knowledge coming from the activities organized out of
schools. This may indicate that personnel working with children at these activities recognize the significance of gymnastics better and that there is some implementation of basic gymnastic skills also in other sport disciplines.

The results of the opinion survey presented in Table 1 show that before the start of the course some statements were already very highly valued (scores over 4, October column, table 1). Students appreciate acrobatics as a positive training for development of space orientation, determination and motor development. After the 30-hour study course many statements changed significantly in a positive direction. According to the opinions expressed in December after the acrobatic course we may conclude that students now accept acrobatics as an important content in the curriculum for elementary and secondary school. Students also raised their opinions of the value of acrobatics for developing space orientation, interpersonal help, persistence, working habits, child bio-psychosocial development and physical development. The only opinion that was of significantly lower grade is the statement about the fear of acrobatic elements, however this is positive change, as it means that they have a lower fear to perform them.

It was found that the success at gymnastic program is significantly dependent on the self-determined motivation (Boiche et al., 2008). Although motivation was not directly assessed in this study we may speculate from the relatively high grades of opinions at the start of acrobatic course that the low level of pre-existing knowledge is probably a more important obstacle for a better success in gymnastic course than a possible lack of self-determined motivation, however this must be confirmed with further studies.

The measured obvious positive change in opinions after the course implies that the problem of gymnastics and acrobatics in elementary and secondary schools lies predominantly in insufficient amount of time spent for gymnastics and acrobatics (Kovač et al., 2002). It is impossible to do the whole exercises without sufficient technical knowledge. Fear, which is often one of the main reasons for acrobatics and gymnastics not being on schedules for PE classes (Turšič, 2007), can be easily overcome with proper use of technical aids and improved didactics. It is a free autonomy of PE teachers in Slovenian elementary and secondary schools to decide on the time devoted to gymnastics, so the positive results of improved opinions after the 30-hour acrobatic faculty program give hope that in the future this time will be extended.

Concerning the drawbacks of this study we should point out that this was a non-randomized prospective cohort study and that there was no control group of students. Also, the questionnaire used was only tested in the pilot study for the correct understanding of the questions; no assessment of additional possible biases was done. On the other hand we have enrolled all the female students of the first year at the Faculty of sports which represent the whole population of Slovenian PE students of that year.

It is obvious from our results that PE teachers do not fulfill all the tasks they have set in official curriculum for elementary and secondary schools. Therefore higher level of control of their work should be established either by school or government authorities. It is also possible that demands of curriculum are too hard, but if we bear in mind all the positive effects of acrobatics on development of motor abilities (strength, coordination, flexibility, equilibrium) and personal characteristics (self-control, persistence, determination, working habits, interpersonal help) this is not the case. Institutions outside the school can help, but they cannot replace the school tasks. There might also be a lack of knowledge of PE teachers in the field of gymnastic methodology and didactics as pupils (students) have a lack of theoretical and practical knowledge. The possible immediate solution would be a change in the selection process when accepting students to the Faculty of Sport. Instead of testing motor abilities, we should test acrobatic practical and theoretical knowledge.

Conclusions

Our results show that the preexisting knowledge of acrobatics is low in first year female students on the Faculty of Sport. These students however show a rather high opinion about
the significance of acrobatics for elementary school physical education, with many of these opinions becoming even significantly more positive after the 30-hour acrobatics program. To improve the overall success of students in gymnastics the proposed immediate step is to change the selection process to the Faculty of Sport to predominantly assess acrobatic knowledge instead of motor abilities.

References


