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ANALYSIS OF NEWSPAPER REPORTS ON SPORTING EVENTS FROM THE ASPECT OF GENDER INEQUALITY

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Submitted in April, 2005

The aim of our research was to establish how Slovene media report on sporting events. We were especially interested if there is a prevalence of reports about male athletes, and if there are differences in manner, amount and style of reporting between the articles about male and female athletes. We analysed two daily newspapers and compared the size, the number of articles, and the photographs. We have classified the articles into three groups; articles about male athletes, articles about female athletes and articles about both. We took a closer look at the style of writing. The photographs also play an important role. Therefore, we also compared the amount, type, size and static/dynamics of photographs.

The results of this study confirm some of the preliminary conclusions that the newspapers offer less space, publish less articles and pay less attention to female athletes. By studying the photographs we have reached the conclusion that photographs of male athletes are better positioned and more frequently in colour. The female athletes are depicted in a way that highlights their physical appearance and not their role in sports.

Keywords: Media coverage, gender differences, women's sport.

INTRODUCTION

Sports and media are linked directly. Moreover, nowadays they cannot exist without each other. The world of sports has changed dramatically during the history in the spotlight of mass media. Today, the media choose, interpret and represent sporting events predominately to draw in an audience. Sports in media reflect the ideas of certain people and values in certain sports and the values of the society in which the events take place. The style and content of sports programmes are designed to entertain the audience who can sometimes be so engrossed in what they read, hear or see that they tend to accept it as the only reality (Maguire, 2002).

Similarly, the participation of female athletes in sports has changed over time. In past, women were forbidden to participate in sports, but gradually the society allowed them to enter the sports sphere. Today, there are less and less sports that women cannot participate in. But there are still many differences when it comes to female participation in sports. Male athletes still have more representatives in sports (Olympic Games 2000 – 62% male athletes and 38% female athletes), more competitions (Olympic Games 2000 – female athletes participated in 44% of all the competitions), which are seen by more audience. The male sporting events are better covered by media; they get more written articles and they are published differently than those which cover female athletes' successes, female teams and individuals.

Including women and men into sports partly depends on the definition of what a woman and a man represent in a society. The primary difference is biological (sex). Nowadays, in humanistic debates people point out the social meaning of differences (gender). The society attributes certain characteristics to individuals of certain gender. But these characteristics already differ on the level of different cultures. The social organisation of the environment is the factor that influences the way members of a society perceive each other, how they behave and how they communicate. Throughout the history the social definition of gender was described as polar and unequal. The role of women was limited mainly to reproduction, care for home and family. The male dominance was obvious in all other areas of life, living and work. In the twentieth century more radical changes occurred, resulting in the increased participation of women in activities, which were viewed as male, including sports (Leonard, 1998).

In the last two decades there has been an increased interest of experts in the question of female participation in sports and physical activities. Numerous researches show that gender inequality in sport is still a persistent problem. The perception of sport today is not universal – it is divided into female and male sports. The direct comparison of female and male results strengthens the assumption that female sports are less appreciated than male. In sports, there is a considerable difference in the ideological differences between sexes, which is evident from the descriptions of the events – as if that goes

without saying – as neutral facts. “The female sport is a phenomenon of secondary importance in the society. It is nice and precious, but it definitely cannot be compared to the importance of male athletes’ achievements. They cannot be judged equally, although the female and male parameters are constantly compared” (Doupona, 2004).

The media have a great influence on how the society views the sporting achievements. The mode and frequency of reports on male athletes plays an important role. Many researchers (Duncan, Messner, Kane, Lensky etc.) claim that female athletes are frequently overlooked and that they represent a mechanism that keeps the sports as a part of men’s world. The female athletes are mostly the subject of false commentary or are presented in passive role in order to contribute to the male dominance (Chrisholm, 1999; Daddario, 1994; Harris, 1999). Men used to dominate in sports; they represented the power and the privilege that women did not have. In media, sports often reflect the ideology of dominance and cultural idea of gender. It seems that sports in media reflect the balance of power between sexes in sports and in the society as a whole. They reflect a cultural trend which gives women a relatively subordinate position in comparison to men. Female sports are less reported on than male, in press as well as on television. The amount of space in newspapers intended for women’s sports is extremely small. The published stories and news on women’s sports focus on the appearance of the athletes, rather than on their performance. This is how the sports in media reinforce the ideals of manhood and femininity (Maguire, 2002). Lever and Wheeler used a longitudinal study to monitor the reporting on sports pages from 1900 to 1975. They discovered that in 1900 female athletes were awarded 1.2% of the whole space in the paper. Between 1925 and 1950 the percentage grew to 2.8%, until 1975, when it grew for only 0.1%. In the English speaking world more important newspapers (The London Times, The New York Times, Morgunbladid), according to the research done by Valgerisson and Snyer (1986), dedicated less than 10% to female athletes (Vincent et al., 2002). In spite the impressive performance of female athletes in the last decades, the media tend to underrate their accomplishments. A study after study, preformed in the last years, has shown a clear pattern showing that the media report less on female sports and tend to trivialise it (Bodenstedt, 1988).

The purpose of this research was to determine the characteristics of reporting in two selected Slovene newspapers and to establish how press reports on male and female athletes and how they are portrayed.

METHODS

We included two Slovene daily newspapers in our analysis. They are not geographically specific; they cover the whole Slovenian territory. Delo is a daily newspaper that covers all types of events, and has 2 pages of sports, except on Monday when it contains a sports supplement. Ekipa is a sports newspaper and contains only articles on sports. In the period of one month (except on Sundays) we monitored the articles in Delo, and during this period we also monitored Ekipa for one week. For the article analysis we used the basic statistics for determining the balance between articles about male and female athletes, the size and number of articles, and photographs. In the beginning we classified these articles to male (reporting exclusively on men), female (reporting exclusively on women) and mixed articles (reporting on both female and male athletes). We were interested in sports that are most frequently mentioned, and in the balance between male and female articles. We carefully examined the writing style and tried to determine whether the article describes a professional, public or private life of male and female athletes. We also measured the size of the articles. The photographs have an especially important role in the articles; therefore, we compared the amount, type, size and dynamics/static of photographs. The size of the articles and photographs was expressed in cm². We monitored the objectivity of reports or the means of expression, which describe sporting events from other standpoints (for example, focusing on bodies of female athletes).

The daily Delo was monitored in the period between 8 July 2003 and 7 August 2003. During this period (26 days) the paper published 576 articles on sports. The sports daily Ekipa was monitored from 21 July to 26 July, and it published 282 articles in that period. The newspapers were chosen on the basis of the following factors: national reach, media coverage of sporting events, availability (market price of the two is comparable).

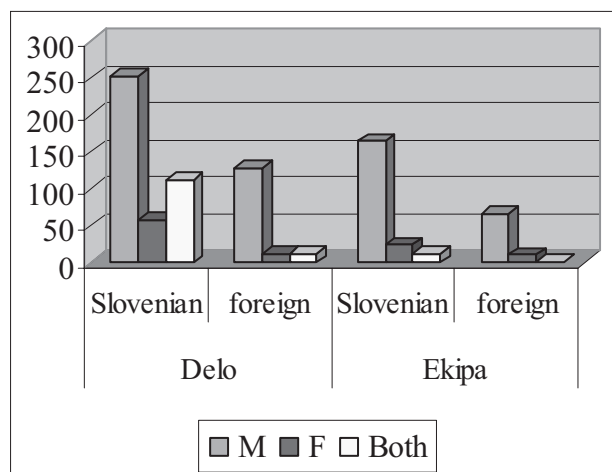
RESULTS

Delo published 381 articles which reported exclusively on male athletes, of which 252 (66%) articles on Slovenian athletes, and 129 (34%) articles covering foreign athletes. Female athletes featured in 70 articles, of which 58 (82%) on Slovenian athletes and 12 (17%) on foreign athletes. There were 125 articles which featured female and male athletes. In total, Delo published 12% of articles featuring only female athletes and 21% of arti-

cles which featured both, of which 73% featured Slovene female athletes. The daily Ekipa published 282 articles. 232 (82%) featured male athletes, of which 58% articles featured Slovene athletes. Only 35 or 12% of the articles featured female athletes, of which 8% featured Slovene female athletes. 15 articles were mixed and 4% about Slovene athletes.

Fig. 1

Articles in Delo and Ekipa (classified according to sex)

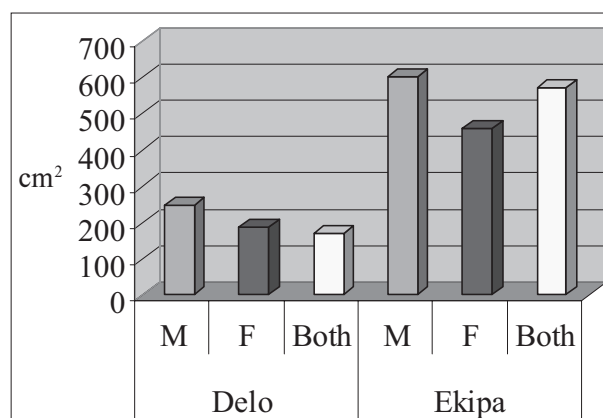


Division of the articles according to sex shows that male articles are dominant in both newspapers. In both newspapers there are 12% of female articles in comparison to male. Ekipa published fewer articles featuring mixed reports on events than female articles, if compared to Delo. Both newspapers featured more events of Slovene athletes than the foreign ones.

In proportion with the number of articles, male athletes also get more lines in the articles – a larger article size. By measuring the size of the articles we determined that Delo has an average article size of 222.8 cm². The articles that feature female athletes have an average size of 186.2 cm². The articles featuring male athletes have an average size of 246.5 cm², while mixed articles average is 171.6 cm². Taking into account the fact that Ekipa is a sport daily, the article size follows its purpose. Their average size is 574.7 cm², which is 2.5 times larger than the average in Delo. The average size of articles featuring female athletes is 460.1 cm² (604.4 cm² for male athletes). Mixed articles have the average size of 574.7 cm². The balance between sizes of female and male athletes' articles in both dailies is 1 : 1.3.

Fig. 2

Article size in Delo and Ekipa



The writing style in male and female articles differs especially in terms of objectivity, presentation of the individual's accomplishments/failures, and inclusion of relevant (or irrelevant) circumstances of the activity in the article. The men – the athletes, are mostly described as strong, tireless, and full of energy. On the other hand, women are described as vulnerable and helpless. Special attention is devoted to their physical appearance. The comparison between the newspapers showed that both Delo and Ekipa contain a great number of articles that describe women – female athletes as described above. The statements that confirm the dominance of men were found in Delo and are stated below:

- ...a talent, born only once every thirty years...
- ...it awoke the beast in the champion, hungry for the grandest sports pleasures...
- ...strong as an elephant and fast as a cheetah...
- ...the king of sprint, Caesar of Ethiopia...
- ...yellow cowboy, killing machine, tracker, superhero...
- ...Iron Mike...

The daily Ekipa adds also:

- ...grand master, magician...

Examples of statements for female athletes in Delo:

- ...she fell asleep at the start...
- ...her competition will be in the form of two bunnies...
- ...she often appears in advertisements and "men's" magazines...
- ...a goldfish, beautiful Hannah (a man in the same article is a torpedo)...
- ...Cuban flea...

Ekipa delivered the following statements describing female athletes:

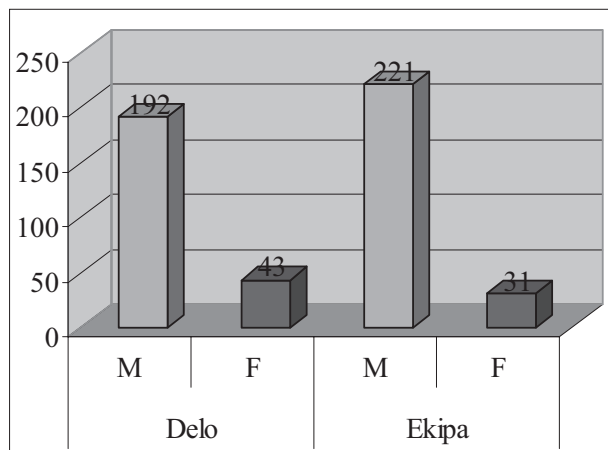
- ...her bottom...
- ...new "pin up" tennis girl...
- ...if she had balls...

No matter how successful they are, male athletes are described as strong men, heroes, and invincible persons who never make mistakes. If the mistake should occur, it is not published in the media, or the writer uses the style that alleviates all the weight and discomfort. In contrast, the failures, mistakes and "awkwardness" of female athletes are a desired subjects for discussion and reports. The icing on the cake are the photographs attached to these kind of reports, which only strengthen the female "incompetence and weakness" on sports terrains. A statement, that "she has fallen asleep at the start" proves that the writer attributed to the athlete the inability to perform a good start, while male athlete was crowned as a "king of sprint".

The daily Delo published 2.1% of articles dealing with private life of athletes and 2.7% articles dealing with public life of athletes of both sexes. In Ekipa we recorded 1% of private and 3% of public articles. The rest of the articles were defined as professional articles – they reported exclusively on sporting events.

The analysis of the articles also included the photographs in them. In the photograph analysis we wanted to discover whether Slovenian situation also follows the same patterns as foreign one, and whether Delo and Ekipa differ in the amount, themes and bias of the photographs published. The photographs complemented numerous (probably) more important articles.

Fig. 3
Number of photographs in Delo and Ekipa



Delo published a total of 242 photographs, of which 192 of male athletes, 42 of female athletes, and 7 mixed. Ekipa published 254, of which 221 of male athletes and 31 of female athletes. Of all the published photographs in Delo, 144 (59.9%) were black and white. The rest (98 photographs, or 40.4%) were in colour. 192 photographs portrayed male athletes (79%). Less than a quarter of photographs (17.8%, or 42) were of female athletes, the rest (2.9%, or 7) were mixed. 77 or 31.8%

colour photographs were of male athletes, while female athletes were portrayed 17 times (or 7.0%) in colour photographs. Delo published an average of 8.9 photographs per issue. Ekipa published 254 photographs in a week, of which 182 (71.6%) were black and white, and 72 (28.3%) were in colour. Female athletes were portrayed in 31 (12.2%) of photographs, while male athletes in 221 (87%). Only one of the photographs was mixed. Photographs of female athletes were in colour in 14 cases (5.5%), while photographs of male athletes were in colour in the quarter of the cases (22.4%, or 22 photographs). On average, Ekipa published 42.3 photographs per issue.

An average photograph of a female athlete in Delo was 97 cm² in size, while the average photograph of male athlete was 72 cm², and total average photograph in Delo was 77.7 cm² in size. The average size of photographs in Ekipa was 123 cm². The photographs of female athletes in Ekipa had an average of 115.5 cm², while the average size of male athletes' photographs was 124.4 cm².

We classified the type of photograph according to static or dynamic contents. Inside static photographs we especially defined the category of portraits. More than a half of photographs in Delo (54.9%, or 133 photographs) featured female or male athletes in action. 109 (45.9% of 242) dynamic photos were of male athletes, while female athletes were photographed in action 23 times (9.5% of 242). 109 or 45.0% were static photos, while there were 94 or 38.8% portrait photographs. The division of photographs to static and dynamic has shown that, similarly as in Delo, Ekipa also featured more than half of dynamic photographs (56.2%, or 143 photographs). Female athletes were photographed in action 234 times (9.4%), and male athletes 119 times (46.8%). Altogether 109 (42%) were static photographs, 101 (39.7%) of which were portraits.

DISCUSSION

The aim of our study was to learn if the female athletes are inferior to male athletes in the way media report about their sporting accomplishments. We tried to classify the details and differences between sports articles of the two daily newspapers and to establish if the media are biased.

We discovered that there is a difference in the amount and tone of reporting that the two dailies apply when dealing with sporting events. Most of the findings of this study confirm that the dailies in a way encourage the male dominance – male athletes. Among all the articles (858) there were 613 articles identified as about men, which represents 71% of all the published articles. With the exception of tennis and athletics, most

articles feature men, the majority is dedicated to football (88 in Delo and 117 in Ekipa). The amount of reporting is not always an indicator of quality; nevertheless, the analysis established that articles on male athletes are longer than the ones on female athletes. The mode of reporting about sporting events also contributes to the establishment of a certain opinion about the events. According to our findings, female athletes were more often represented as helpless, vulnerable, etc. The male athletes were described as strong men, full of energy and zest, enduring and invincible.

We believe that the media can represent one of numerous obstacles to establishing of female athletes. The photographs are often more convincing than words. In the analysis of articles on sports we also included the analysis of photographs depicting male and female athletes. In the past studies, as well as in our findings, female athletes were depicted in a way that highlights their physical appearance (outlook), their psychological characteristics, bodily strength (or the lack of it), and their family role.

Together, both daily newspapers published 496 photographs, where male athletes were depicted in 82.2% of photographs, and female athletes were depicted in only 14.9%. In Delo 45.0% of all the photographs were dynamic, and showed male athletes in action. In Ekipa there were 46.8% of such photographs. Female athletes were depicted in action in Delo in 9.5% of cases, and in Ekipa in 9.4% of cases. It is apparent that female athletes get fewer articles and also fewer photographs. Male athletes get not only larger number and size of the articles but also more photographs, and the articles and photographs are placed in places that are easier to be noticed by the reader (front page, first page, on top). The relevance of the accomplishments of female and male athletes cannot be compared. For example, female athletes win a second place in the World championship, but the article about it is put on the last page, at the bottom of the page. By analysing Ekipa for the whole week, there was not a single photograph of a female athlete on the front page. Delo published 12 photographs of female athletes in a month on the first page, which were in the top position in only three cases. "By assigning this position to photographs depicting female athletes, the media - newspapers - emphasise the unimportance and inferiority of women in sports" (Petersen, 2002). Through the study of photographs, we discovered that the photographs of male athletes are better positioned and more often in colour. This way the newspapers represent an additional obstacle that encourages the marginalisation and contributes to the feeling of triviality in case of female sporting activities.

CONCLUSION

The results of this study confirm previously proven statement that female athletes are awarded less space in newspapers, get less articles and are paid less attention. This is how the stereotypes that sport is men's sphere and that men are better adapted to sporting activities are supported. A majority of analysed factors (except the size of photographs in Delo) shows that sport which media report on is "reserved" especially for men - male athletes.

It seems that, like running a marathon, reaching the equality of women in media coverage is a long lasting process.

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**ANALÝZA NOVINOVÝCH REPORTÁŽÍ
O SPORTOVNÍCH AKCÍCH
Z POHLEDU NEROVNOSTI POHLAVÍ
(Souhrn anglického textu)**

Cílem našeho výzkumu bylo zjistit, jakým způsobem slovinská média referují o sportovních akcích. Zvláště nás zajímalo, zda převládají zprávy o sportovcích a zda existují rozdíly ve způsobu, počtu a stylu článků o sportovcích a sportovkyních. Analyzovali jsme dva deníky a porovnávali rozsah, počet článků a fotografie. Články

jsme rozřadili do tří skupin: články o sportovcích, články o sportovkyních a články o obojích současně. Podrobněji jsme sledovali jejich styl. Velkou úlohu rovněž hrají fotografie. Srovnávali jsme proto množství, typ, velikost a statický/dynamický charakter fotografií.

Výsledky této studie potvrzují některé z předběžných závěrů o tom, že noviny sportovkyním poskytují méně místa, publikují o nich méně článků a věnují jim menší pozornost. Zkoumáním fotografií jsme došli k závěru, že fotografie sportovců jsou lépe umístovány a že jsou častěji barevné. Sportovkyně jsou zobrazovány tak, aby vynikal jejich tělesný vzhled a nikoli sportovní role.

Klíčová slova: pozornost médií, rozdíly podle pohlaví, ženský sport.

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Teacher in primary and secondary school and trainer in volleyball club. Ph.D. student at the Faculty of Sport in Ljubljana.

Scientific orientation

My research activities are focused on sociology of sport.

PREPARATION FOR WAR AND SPORTS IN THE KINGDOM OF CASTILE (SPAIN) DURING THE 15TH CENTURY - A SPECIFIC STUDY OF THE CITY OF SEVILLE

Gonzalo Ramirez Macías

Faculty of Physical Education and Sport Science, University of Seville, Seville, Spain

Submitted in February, 2006

The main purpose of this research is to know and characterize the sports that were practised with the purpose of preparing the participants for war, during the XVth Century in Castilian Spain and especially Seville (one of the most prosperous Castilian capitals at that time). The first part of this research is devoted to its justification and basis, whereas the second part puts forward the research methodology suggested, which has a new nature within the history of Sports. Thirdly, the results obtained in the research are presented and analysed. Finally, the research conclusions are expounded, which are based on its result and on other contributions from previous research projects.

Keywords: Sports, war, XVth century, Spain.

INTRODUCTION

The territories that form the Iberian Peninsula were divided during the 15th century into different kingdoms, which were the embryos of the modern future states that shape the current geographical panorama of the peninsula. Concretely, the geopolitical panorama of that era marked the existence of five peninsular kingdoms: Castile, Aragon, Navarre, Portugal and Granada, of which the first four were of Christian origin and had shaped their territories starting during the reconquest of the Iberian Peninsula, and the last one of them, Granada, arose as a result of the breakup of the third "taifa" kingdoms in the 13th century, being the last Moslem one in the peninsula (Suárez, 1970). This territorial situation determined a constant tension among the different kingdoms, which were in constant battle among themselves in order to increase their territories (Riu, 1989). Because of all this, it is possible to affirm that the wars among kingdoms, overall that against Granada, were permanent and this caused preparation for war to be one of the most promoted aspects by the powers of the time.

The fostering that leaders of that period made of war spread to all aspects of society: economy, religion, education, etc. Certainly, it also happened with the entertainments of the time, among which different types of sports stand out. Many authors have emphasized the warlike orientation that most of the medieval sports had. Domínguez (1995) indicates that the majority of these were practised by the nobility, which was the reason why they were given the name of "the warrior class". Mandell (1986) not only defends the previous attitude, he also complements it affirming that the great majority

of medieval sports had as a goal the preparation for war. Finally Betancor, Santana and Vilanou (2001) insist on the warlike character of the sports of that time, affirming that the nobility practised tournaments and jousts in the scanty periods of peace to fill the war emptiness that the absence of battles caused them and also to be prepared for them.

But which are specifically the sports that were practised in the middle ages inside the Iberian Peninsula? Several authors have approached this question (Díez, 1966; Rodríguez, 2003; Hernández, 2003; Salvador, 2004), the sport activities that these authors show off as typical ones being the following: hunting, tournaments, jousts, "juegos de cañas", "bohordos", bullfighting, "correr la sortija", duels or challenges, "pasos de armas", horse riding, fighting (leonesa or canaria), bow shot, cross-bow shot, ball games ("frontón", "paume", "mallo", "vilorta"), athletic activities (especially jumping, throwing objects and running), and finally childrens' games such as spinning tops, balls and bowling.

The question that inexorably arises is: "Which of these sports took to be as their main purpose the preparation for war?" This research, whose objective is the study of the sports practised during the XVth century (both in the Kingdom of Castile and in the city of Seville) with the purpose of preparing the participants for war, tries to contribute with some conclusions towards a resolution of this issue.

OBJECTIVE

To know what sports were practised during the XVth century with the purpose of preparing the par-

ticipants for war inside the Kingdom of Castile and, specifically inside the city of Seville.

METHOD

In this study, the historical method is the one used, being used in this case under the principles of qualitative methodology. The sources handled in this research in order to obtain information are, on the one hand, the chronicles of the Kingdom of Castile that refer to facts of the XVth century, since according to Aróstegui (2001), among the great quantity of writings that can be found referring to a historical period, the chronicles are, possibly, those from which relatively more information serves as a contribution to the researcher's efforts to find out more about the lifestyle, customs and activities of men and women who lived during the time that is being researched. Specifically, the above mentioned chronicles are:

- the chronicle of Juan II of Castile,
- the respreading of Juan II's Falconer's chronicle of Castile,
- Juan II's Falconer's chronicle of Castile,
- Don Álvaro de Luna's chronicle,
- the Victorial, don Pero Niño count of Buelna's chronicle.

On the other hand, the Municipal file of Seville has been used, since from the letters, privileges and other historical documents contained in the same, it is possible to obtain relevant information for this study. This information has to be added to the data obtained from the analysis of the chronicles mentioned above.

RESEARCH DESIGN

The research design proposed for this analysis has three well differentiated parts. First, the sources review from the documentary analysis of the same, which once ensured the reliability and validity of the information contained in these sources, the analysis of content, which was done in a computer assisted manner using the program ATLAS/ti, is applied, in order to obtain in a methodical way the information contained in these sources relevant for this research.

Finally the last part of this research design consists of the triangulation of the information obtained in each of the sources analyzed.

DESCRIPTIVE CATEGORIES OF THE OBJECT OF RESEARCH

The characterization of the sports object of study in this research is realized using a few descriptive categories, in order to gather the existing information regarding the documentary sources in a systematical way. Concretely, the set of categories used are the ones suggested by Lavega (1996) for the study of popular - traditional games. The above mentioned categories are divided in two big groups, the ones belonging to the internal logic of sport (that study the regulation of same), and the ones belonging to the external logic of sport (that study the social context where each of these practices are placed).

Now the categories used are exposed in a synthetic way, using two grids, the first one referring to the internal logic (TABLE 1) and the second one to the external logic (TABLE 2).

TABLE 1

Categories of the internal logic

INTERNAL LOGIC
Space: Referring to the rational adjustment of space that the participants of every sport make, it is a question of defining the occupation of the space and the zone division of the same.
Temporary characteristics: Define a certain temporary sequence of the sport's actions. Concretely, it refers to how the players used to take part and the criteria that determined the duration of the activity.
Tools used: In sports participants can use materials. This category not only mentions the name of the materials used, but it also differentiates the type of contact and the part of the body involved in the use of those materials.
Participants: This category analyzes the number and distribution of players who take part in each sport.
Net of motor communications: It determines the type of motor communication that takes place inside a sport.
Ways of winning: This category establishes the routes by which the aims of the sport can be reached, that is, it indicates how someone can win.
Ways of participating: It is about defining what types of roles or motor behaviors are given inside a sport. This category, apart from determining these roles, categorizes them depending on the stability of those along the duration of the activity.

TABLE 2
Categories of external logic

EXTERNAL LOGIC
Emplacements: Related to the knowledge of the local characteristics where the sport develops.
Temporary locations: Consists of knowing the continuity of the sport in the life cycle of a certain group of people. Concretely, this category describes the moment of the day in which every sport is practised, if it took place on concrete dates and if it was typical of a specific season.
Materials: This category only appears when materials are in use, categorizing each of them depending on its origin, type of raw materials that compose it and the type of property it is.
Protagonists: This category analyzes aspects of great relevancy for this analysis, concretely the age, sex and social class of the participants in every sport.
Prizes: This category only appears when there are prizes or remunerations for the participants, categorizing them depending on if they are tangible or personal goods.
Associate celebrations: This category only appears when a sport takes place during a concrete celebration. It refers to the type of celebration or event inside which the sport being analyzed develops.

ANALYSIS AND DISCUSSION OF THE RESULTS

The results obtained in this research, taking into account the existing information in the analyzed sources, indicates that during the XVth century inside the Kingdom of Castile, and specifically inside the city of Seville, the following sports were practised with the purpose of preparing the participants for war. The characterization made of each of these activities, from the information obtained for each of the descriptive categories used in this study, is a synthetic one. It has to be pointed that there are sports for which concrete information has not been gathered in any of the descriptive categories, due to the fact that there was not information about them in the analyzed sources.

“Juego de cañas” (game of canes): The regulation of this sport indicates that it was an activity realized in teams, every warrior riding a horse and dressed with an “adarga”, that is, with a shield of oval leather and with canes. All the warriors acted simultaneously, using the former for defending themselves from the warriors’ shots of the other team, and the latter, the canes, to attack the opposite team shooting them. That is why in the Victorial it is said: “Durante el rey aquella vez en Sevilla, fueron fechos muchos juegos de cañas, en los quales este doncel, de quantas vezes aquel juego se hizo, bien podrían decir la verdad los que le vieron jugar que no andava allí cavallero que más hermoso lanzase una caña, ni que tales golpes diese. Ca muchas adargas buenas fueron oradas de su mano” (Carriazo, 1940b). This game lasted until the warriors of one of the teams gave up or their horses were so exhausted that they could not continue.

The social context where this sport is inserted is characterized by the following aspects. Firstly, it was an activity that was nailed into the frame of typical celebrations of several types of events: ecclesiastic, civic, family and extraordinary. For it was not typical of a season

or a concrete date but it could take place throughout the whole year, though it was always performed in the morning or in the evening, but never at night. They took place in streets or city squares, which were fenced, and scaffolds were also set up in order to serve as stands for the spectators; there were also special zones for the nobility. Regarding Seville, these competitions took place at the San Francisco square. The people who practised this sport were men of the nobility, who used their own horses and shields, but they were given the canes which, therefore, were common property, being supplied by the organizers of the game of canes (who were determined by the type of celebration inside which this game was realized). Finally, it has to be pointed out that the participants were offered different kinds of prizes of various nature: clothes, jewels, weapons and animals.

The cross-bow game: The name given to this activity is due to the fact that it was the name by which it was known at that time, in fact in Don Álvaro de Luna’s chronicle it is mentioned: “Avia grand plaçer en fallar a qué vallestear, e en el juego de la vallesta maravilla era fallar quien le ganase” (Carriazo, 1940a). The regulations for this sport indicate that it was an individual activity, every player had his own cross-bow and arrows to be used. All the participants, usually lots of them, made a certain number of shots (the number of shots was previously agreed upon by the participants), the winner was the participant making the most accurate shot to the chosen target.

The social context where this sport is inserted is characterized first because it was an activity practised by men of the nobility, we having no information regarding the practise of this game by other social classes. Secondly, this sport was practised frequently, there not being necessary concrete celebrations for its practice. For these reasons it is not typical, neither of celebrations nor of any particular seasons nor concrete days; considering when they took place, but it is important

to say that it was practised, logically, in the sunlight, either in the morning or in the evening. Thirdly and last, considering the places where this sport took place, it has to be pointed out that references have been found to that practice not only in built-up zones but also in nature, although always in open spaces, since its practise needed a large area.

“Juego de viras”: This sport was known at that time as “juego de viras”, as read in the following quotation of the *Victorial*: “Hera muy buen puntero, así de ballesta como de arco, muy çertero. Hera puntero maraulliso de juego de viras” (Carriazo, 1940b). This activity consisted of throwing a “vira” to a predetermined target. According to Cobarruvias (1977) a “vira” is a “certain type of arrow or short spear”. Unlike other sports of precision shot seen previously, this one has at least one of the targets on which the shots were realized well defined, as appears in the *Victorial*: “Un día acordaron algunos caballeros mancebos de los más esmerados del real de yr lanzar lanzas a la puerta del palenque” (Carriazo, 1940b). The “palenque” at that time was “la estacada que se pone para cercar el campo donde ha de aver alguna lid o torneo. Dixose así porque se haze de estacas y palos hincados en tierra” (Cobarruvias, 1977). That is, the shots were realized on stakes or trunks fixed in the soil.

The social context where this sport is inserted is characterized by the following aspects. First, it was an activity practised by nobles, ranging in age from youth to adulthood; though it is necessary to point out that the majority of the quotations found mention that it was an activity principally practised by youth. Secondly, it is necessary to emphasize that this sport was regularly practised, since as has previously been indicated, it was used as a way to exercise spear throwing, very useful in the art of war. As for time aspects it is important to say that it was practised, logically, in the sunlight, either in the morning or in the evening, since it was not typical of any season or concrete dates. In addition, it has to be said that, being a sport with few social repercussions, it was not associated with any kind of celebration. Finally, as for the places where it took place, it has to be pointed out that references have been found to its practice exclusively in opened built-up zones, this being logical due to the great quantity of space that is necessary for its practice.

“Correr la sortija” (running the ring): Few references have been found to this game in the analyzed sources. The scanty references found only indicate that a few riders traversed the ring during the planned celebrations due to the birth of the Castilian prince Enrique, Juan the II’s son. From this information it is not possible to know what this activity consisted of, nevertheless Cobarruvias’ definition of the same is enlightening enough: “A military game, where horse riding participants aim

with a spear at a ring that is put to certain distance” (Cobarruvias, 1977). Nevertheless, Cobarruvias’s dictionary not being an object of study in this research, it is not possible to use the information he contributes as results, that’s why the above mentioned information only must be born in mind as not confirmed guiding reference.

“Armas retretas”: The sport called, by the chroniclers of the 15th century, “armas retretas” basically consisted of combat between two contenders. The regulations of this sport are very well described in the documentary sources analyzed, so it is possible to affirm that this activity had two well defined parts. In the first one, the warriors faced each other astride, using a spear for attacking their opponent and a shield to defend themselves. The space where they fought was separated by a sheet of fabric, so that every competitor had his own zone and could not invade the rival’s one. This phase lasted until both warriors broke two spears attacking the opponent. A quotation referring to this appears in Juan II’s Falconer’s chronicle “y la condición era que fiziesen tantas carreras que cada uno quebrase dos lanças” (Carriazo, 1946b). Once this part of the game was performed, the warriors’ godfathers withdrew them to their respective tents where the spear and the shield were taken and they were given a dagger. Then the second part of the competition began, combat on foot in an area without separations between the warriors, who could only use that dagger as a weapon. This combat consisted of performing fifty dagger blows. In the Falconer’s chronicle ediffusion a reference to this appears: “E luego los padriños sacaron de las tiendas a los caualleros, y lleuáranlos al logar donde se avian de combatir a pie. Los quales avian de fazer çinquenta golpes de dagas” (Carriazo, 1946a). When this phase was ended the participants went back to their respective tents. The winner was the one who had not given up at combat, and in case of no giving up by any of them, the final result of the game was a tie.

The social context of this activity indicates that it was practised by gentlemen, that is, men of the nobility. This sport had great social impact, in such a way that it was carried out in squares prepared for it, with stands, with tents for the contenders where they rested and dressed up, with musicians who played music during the breaks and, certainly, with a fenced area where the combat scene developed. As for the prizes, it has to be pointed out that, regarding the information obtained, that both contenders were offered, for their effort, rich clothes in which they had to dress once the game was finished. Finally, to indicate that this practice was not limited to concrete holidays, seasons or specific days; nevertheless they were always carried out at night, an aspect that is not only confirmed by the results obtained but also by the fact that the word “retreta” contained in the name of this activity, means “military night party”.

“Correr monte”: It is also known as “caça”, “hunt” or “to go to the country”, was a very popular sport during the XVth century, being practised very frequently all around the Castilian kingdom, including the city of Seville. This statement is confirmed by the following quotations: “E llegando çerca de Aranda, sopo cómo el Rey era salido como solía a caça, y con él el conde de Benauenete, y otros muchos caballeros y gentiles onbres” (Carriazo, 1946a). “E partió de Seuilla en sauado veinte seis días de agosto, e plúgole mucho de la posada, e ovo en ella muy grand plazer. Tanto, que así arreçió, e andando a monte e a caça de perdigones e codornices, ay muy çerca de la casa” (Carriazo, 1982). The regulation of this sport indicates that it consisted of going out to nearby forests to hunt animals. Its great diffusion caused it to be practised all the year long, and although it always began in the morning, sometimes it lasted up till the evening. This activity was a practice typical of the men of the nobility that, according to the obtained information, they used this entertainment as a way of keeping themselves and their horses fit, in case of possible future battles. Nevertheless, it seems to be no more than a justification and the hunts were really the nobility’s leisure activities. Besides they served as moments of social exhibition, since the nobles dressed up with their best suits, carried their best weapons and used their best saddles. It is necessary to say that in this game a great number of gentlemen participated, who were always astride and used exclusively a spear as a weapon. The above mentioned gentlemen usually took with them a bird of prey, which had been trained for the hunt. It is important to point out that the falconry, as a form of hunt, had experienced great development inside the Kingdom of Castile and it was common to use birds of prey, usually falcons or goshawks, in the hunts that were organized.

The aim of this practice, logically, was none other than to knock down the piece or wished pieces, for which all the participants collaborated together. As soon as the hunt trophy was obtained the activity ended and normally they celebrated it all together. Finally, as to the pieces hunted, it is necessary to mention that the obtained information indicates that there existed a minor hunt (rabbits, partridges, quails, etc.) as well as a major hunt (bears, wild boars, deer, etc.). Besides it was common, for hunts of special importance, to let free in the forest exotic animals, as for example lions. This can be seen in Don Álvaro de Luna’s chronicle: “Entre las cosas que tenía él más plazer tenía, así por la templanza e bondad de la tierra, e por él ser muy montero, e aver en ella muy buenos montes de muchos puercos e ossos, e otras animalias como leones, los quales mandaba mucho guardar, para cuando él allí venía, o el Rey, que se acaecía ir por allí muchas vezes” (Carriazo, 1940a).

Tournaments: In the Kingdom of Castile, during the XVth century, tournaments were one of the principal entertainments in times of peace, this is why there is a great quantity of documentary sources where they appear. A great part of the regulations and contextual aspects of this sport are confirmed in the following quotations: “E ordenó con una parte cómo fornesçiesen un torneo a caballo, e otro a pie, e señalóles los capitanes para cada uno dellos, e escogió el número de la gente que de cada parte avía de aver, e conçertó con ellos cómo saliesen armados e guarnidos” (Carriazo, 1940a). “E los caballeros fueron prestos al torneo, segúnd el Maestre lo avía ordenado, de los cuales era capitán de una parte don Pero de Luna, hijo del Maestre, e de la otra don Martín de Guzmán; y el torneo se ordenó en el patio delantero del alcáçar. E el Rey con sus caballeros e la Reyna con sus dueñas y donzellas se pusieron en aquellos lugares, que estaban muy ricamente adreçados, donde mirasen. E los caballeros vinieron al torneo muy bien armados y guarnidos, e en muy buenos caballos, e fuéronse a ferir los unos a los otros, como aquellos que estaban usados de lo fazer, no solamente en fiestas e torneos, mas en canpales batallas, e en lugares de mortal peligro” (Carriazo, 1940a).

Of all the information contributed by the previous quotations, concerning the regulations of the game, several aspects can be inferred. First, this sport consisted of a simulated battle between two teams, each one formed by a large number of warriors, though the number was not a fixed one. The aim of every participant was to hurt and to knock down the largest possible number of opponents, since the final purpose of this activity was the surrender of the opposing team. Secondly, it is necessary to indicate that inside every team there existed a captain, who was the one in charge of directing strategically the warriors of his team during the game, so that, although every participant could move freely, he always had to follow the tactical principles marked by his captain. Due to all of this, it is possible to affirm that this sport possessed motor communication and counter communication, because there were both partners and adversaries.

It is necessary to emphasize that there were two variants of this sport, one on foot and another one astride a horse, the aim and basis of each one was the same, the only difference being the use of saddles for the practice of this activity. As for the materials used, in both cases weapons were used, usually shields, spears and swords, though it is necessary to say that the participants and organizers of every tournament agreed before hand on the weapon that would be in use. It is not possible to generalize the utilization of a concrete type of weapon.

The tournament finished when one of the teams gave up and therefore considered victorious the opposite team was considered victorious, nevertheless there

were times where the forces were the same and the scuffles started being bloody, in these cases the maximum authority present in the stands (normally the king or someone in a high position in the kingdom) indicated that both teams should give up, decreeing that neither of them was the winner.

Concerning the context where this sport took place, of which some particularities have already been advanced previously, it has to be said that it was characterized by the following aspects. First, it was a very common activity, which was characteristic of some typical celebrations: family, ecclesiastic and extraordinary. It is possible to affirm that it was not typical of a determined season or date, but it could take place all the year long, at any hour of the day (morning, evening and night). The place where this combat-like sport took place were city streets or squares, which were enclosed by means of fences and scaffolds that were also used as stands for the spectators, there were even special zones for the nobles who were present at the spectacle. Inside the game area, outside the field of battle, a zone existed for every team in which its participants could rest, change weapons, saddles, etc. The people who practised this sport were men of the nobility, who competed in these simulated battles in order to train themselves for war. Finally, it has to be stated that the participants were offered different types of prizes: clothes, weapons and animals.

Jousts: This sport consisted of a combat between two knights, who, riding a horse, attacked the adversary with a spear, trying to protect themselves from the opponent's blows with a shield. An example of the previous statement is the following quotation: "Miércoles a veinte y ocho días del mes de março, año del Señor demill y quatroçientos y veinte y çinco años, fué la primera vez que justó el Rey don Jhoan en arnés rreal en la Cassa de la Ribera, a dos legoas de Tordesillas; e justó con Ruy Días de Mendoza, su mayordomo mayor. El Rey encontre tres vezes en la vuelta del escudo; e fizo vna carrera con Lope de Alarçón, su criado, e encontrolé el Rey a Lope de Alarçón en medio del escudo, e fizo vna vara tres pedaços, e tomó Lope de Alarçón vn gran rrebez" (Carriazo, 1946b).

The place where this combat-like sport took place were city streets or squares, which were enclosed by means of fences and scaffolds that also served as stands for the spectators, there were also special zones inside these for the nobles who were present at the spectacle. The game area was divided into two parts by means of a strip of fabric placed along the whole space. Every joust was placed in one of these parts and galloped in on his horse parallel to the above mentioned strip of fabric, trying to approach maximally to the opponent's zone to be able to attack him better with his spear.

Several types of jousts existed depending on two aspects, on the one hand it concerned the type of harness

used and on the other hand it concerned the organization of the participants. In the first case, we have to differentiate between the royal harness jousts, which were more eye-catching due to the beauty of the weapons and armour, but also more expensive, and the war harness jousts, which were characterized for being more violent than the first ones mentioned here and less eye-catching regarding the warriors' clothes and weapons. In the second case, depending on the organization of the participants, we must differentiate between individual jousts, where every joust competed exclusively for his own benefit, and the team jousts, where the competitors were divided into two teams, each of these teams trying to obtain the major number of victories in the jousts.

Most of the jousts were preceded by an introduction of the theatrical sort in which different contextual situations appeared; all this was in order to give more meaning to the spectacle, and also make it more of a show. As we may deduce, the participants in this sport were exclusively men of the noble class, that is to say gentlemen. The roles they could adopt were that of supporter, who was the organizer of the event and who had the defender's role in the introductory story; and that of adventurer who was that knight who defied the supporter in the introductory story. In both cases, the role was the same, to face the opponent in a joust and try to defeat him.

This sport was practised throughout the whole year, there is even in existence information showing that it took place at any hour of the day (morning, evening and night). This shows the great popularity of this activity, which is confirmed by the fact that it was a part of celebrations of various nature like those of weddings, baptisms, royal entrances, military victories, etc. Finally, it has to be indicated that the prizes the participants received were very varied: weapons, clothes, jewels, horses, etc. However, not all of them got a prize for their participation in a joust. According to the obtained information, there existed a few judges who stipulated to whom the prizes were granted. As seen in Juan II's Falconer's chronicle: "E al primero capítulo es que el cauallero que mejor encontrare, e más desmasya fiziere a los que justasen con él, que le sea dado un presçio por los juezes. El segundo capítulo es que el cauallero que más varas de buena quebrare, que aya el segundo presçio. El terçero capítulo, que el cauallero que mejor troxiese, e mas trabajo e más gentiles carreras fiziese, que aya el terçero presçio" (Carriazo, 1946b). Regarding the information contributed by this quotation and others similar to this, it can be deduced that only three jousts received prizes. First, the one who defeated more opponents. Secondly, the one who broke more spears in the different races. And finally, in third place, the one whose races were best from the point of view of the spectacle.

CONCLUSIONS

Our research has allowed us to know what sports were practised during the XVth century in the Kingdom of Castile and more specifically in the city of Seville with the purpose of preparing the participants for war. Nevertheless, it will be necessary to study the matter more deeply, since the quantity of information about this type of activity contained in the analyzed documentary sources is very broad. That is why deeper research might contribute important knowledge about the sports practised in Spain during the XVth century.

According to the obtained results, it is possible to conclude that in Seville sports were common practice during the XVth century. Besides that, these activities involved the movement of a large number of people, that is why the assembling of stands for spectators was quite common at the San Francisco square and in the collation of stands, places where jousts, tournaments and other sports were usually organized.

The third aspect to be taken into account refers to the participants in the sports, who were mainly men of the nobility, few activities of the other social classes are referred to and women are certainly not, as active participants, mentioned at all. As Salvador (2004) affirms, it is logical that most of the sport activities typical of the middle ages, known to us now, were proper only for the nobility, since it is the social class that had more leisure time and was therefore the only one capable of allowing itself to have a chronicler who reflected facts relative to their lives. Moreover, the warlike character of the noble class, being the only one allowed to carry weapons, allowed for the development of many exclusive activities for the maintenance of the warrior and his equipment before incidental wars. This way, in the city of Seville, the usual participants in these sports belonged to the nobility, frequent practisers being those knights belonging to the grand lineages of the Sevillian society of the time, the Guzmán and the Ponce of León. Nevertheless, it is also necessary to point out that the gentlemen belonging to the lower steps of the nobility, the so called gentlemen of amount, were also common practisers of these sports but in this case more for obligation than for pleasure, since they were forced to keep their saddles and weapons in good condition, and there were periodic boastings.

Concerning the sex of the participants, it has to be pointed out that all the sports found were men's proper activities. Unfortunately, this situation has a simple and good explanation already mentioned by Salvador (2004). The principle is that women exist only when men speak about them, that is, the woman's role in the XVth century was, with some exceptions, totally secondary, taking part inside the sports of the time as mere spectators and only participating by delivering the trophies to the

victors, as it usually happened in the tournaments organized in the San Francisco square of Seville.

Finally, it has to be highlighted that the majority of sports practised during the XVth century both in the Kingdom of Castile and in Seville were promoted and controlled by the dominating structures of the society, that in the case of the XVth century it was the nobility, including inside it the crown and the church. This way, the important gentlemen frequently organized sport shows in order to entertain the common people and to keep them this way under control. In fact, in the city of Seville the principal supporters of this type of entertainment were both of the great lineages of the city, the Guzmán and the Ponce of León. They almost competed in the XVth century for the organization of the major number of sport events inside the city. A special reference is deserved by the church, which, in its search for power, always tried to organize them where there was a religious celebration. In this way the church kept its power status over the people, since it acted as a moral judge saying what was allowed and what was not. In this way, due to the context of the reconquest in which the Iberian Peninsula was immersed in the XVth century, these sports were fostered as preparation for war. We must not forget that the Christian armies fought for the apostle Santiago against the "unfaithful Moors". That is why tournaments and jousts, organized for the the day of the Corpus Christi, the Kings' Virgin and the day of the Virgin of the assumption, were famous in Seville.

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**PŘÍPRAVA NA VÁLKU A SPORTY
V KASTILSKÉM KRÁLOVSTVÍ (ŠPANĚLSKO)
V 15. STOLETÍ -
SPECIFICKÁ STUDIE MĚSTA SEVILLY
(Souhrn anglického textu)**

Hlavním cílem tohoto výzkumu je poznat a charakterizovat sporty, kterým se v 15. století v Kastilii a v Seville (tj. v jednom z nejvíce prosperujících kastilských hlavních měst této doby) lidé věnovali za účelem přípravy účasti ve válce. První část výzkumu se věnuje jeho zdůvodnění a východiskům, druhá část představuje navrhanou metodiku výzkumu, která je v rámci historie sportu nová. Třetí část představuje a analyzuje dosažené výsledky. Dále jsou objasněny závěry výzkumu, které jsou založené na jeho výsledcích a dalších příspěvcích předcházejících badatelů.

Klíčová slova: sport, válka, 15. století, Španělsko.

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COMPARISON OF ASSESSMENTS OF PARENTS' AND COACHES' BEHAVIOUR BY MALE AND FEMALE TENNIS PLAYERS OF DIFFERENT AGES

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Tennis is clearly one of those sports games where success is influenced by one's psychological abilities. Throughout their sports careers tennis players are usually exposed to psychological pressure. The aim of the study was to investigate how young tennis players assess the behaviour (psychological pressure) and activity of their mother, father and tennis coach. The sample included 96 male and 96 female players distributed in three age categories who filled in three questionnaires of the closed type. Data were processed in accordance with the research goals.

Descriptive statistics parameters were calculated for all variables by gender: mean value, standard deviation, minimum, maximum, skewedness, kurtosis and the Kolmogorov-Smirnov test for normality. The analysis of variance (ANOVA) was used to compare the assessments of behaviour of a player's father, mother and coach by gender and then between the three age categories (U12, U14, U16).

A comparison between the assessments of the father's, mother's and coach's behaviour in terms of gender only revealed statistically significant differences in the assessments of the father. When assessments of both parents' and the coach's behaviour were compared in terms of age category, statistically significant differences were again established only in the assessments of the father.

Keywords: Tennis, juniors, parental and coach pressure.

INTRODUCTION

Tennis is clearly one of those sports games where success is influenced by one's psychological abilities. The most important of these abilities include motivation, control of one's feelings, thoughts, attention, mental images, sensations and behaviour (ITF, 2002).

Although top male and female tennis players have been found to be well prepared for overcoming psychological pressures and are up to the requirements of the game, as reflected in their mental toughness, this is not always true of young male and female tennis players. The latter are exposed to a series of demands, pressures and even psychological violence.

Psychological violence is one of the most widespread forms of violence (Kuhar, Guzelj, Drolc, & Zabukovec, 1999). In the course of our lives we are all victims of this type of violence, as well as its initiators. Most often it takes the form of oral violence, with deliberate or thoughtless words, prejudices and stereotypes, offensive opinions and possibly even non-communication. Silence frequently has a similar effect as yelling at or hitting a person. Actual forms of psychological violence are the following: intentional or unintentional use of harsh words and opinions; yelling, insults, abusive words and

degradation; forming negative opinions about a person based on prejudices and stereotypes; quarrelling or disagreeing with one party abusing their physical, emotional, economic, hierarchic, institutional or other type of dominance; blackmail and threats (including through physical, economic or other sorts of violence).

The consequences of psychological pressure are also reflected in young male and female tennis players who react differently, and they sometimes lead to the end of a sports career. The reactions can be classified in four categories: distancing, uncontrolled emotional outburst, stiffness and "accepted challenge" (Šporn, 2002).

Distancing is the first emotional reaction of female and male tennis players. Female and male players devote less effort and energy to tennis as well as mentally distancing themselves from what they are doing and experiencing. In this way their self-image is threatened less.

An uncontrolled emotional outburst is a male or female player's very emotional, uncontrolled, often angry and furious response to a difficult situation. A male or female player thereby protects him/herself from the unpleasant and unacceptable reality of events. Through such uncontrolled outbursts the player lets the opponents, parents, coaches and spectators know that they are not in fact that bad, but rather that they are having a bad day.

Stiffness is a response when a male or female player experiences emotional and physical discomfort, tension and distrust of their own abilities. Many perceive this reaction as a sign of something very positive. On the way to mental toughness, stiffness is a more suitable response than distancing and an emotional outburst. If players become stiff, they are very focused on what they are doing. They take risks and are willing to expose their ego to criticism. For players who have already overcome the distancing and emotional outburst phase, stiffness is a sign of progress. The more opportunities a player has in order to deal with pressure constructively, the faster they will find success.

Accepted challenge is the last response on the way towards mental toughness. Male and female players who are capable of accepting a challenge work more intensely and play better if the game situation is tense. Players no longer see the problems they encounter in a game as threatening and unsolvable, but as a challenge to try harder and resolve their problems more easily.

The development of a young tennis player is the responsibility of parents, tennis and other coaches who guide and lead the player. Several research projects carried out in the past indicate that among young athletes parental support is associated with the greater enjoyment of sport (Left & Hoyle, 1995; Baxter-Jones & Maffulli, 2003), a more positive appraisal of performance outcomes (Smith, Zingale, & Coleman, 1978), and more positive appraisals of self-worth (Left & Hoyle, 1995). Parental support is defined as behaviours by parents perceived by their children as facilitating athletic participation and performance, while parental pressure is behaviour perceived by their children as indicating expectations of unlikely, even unattainable heights of accomplishment (Left & Hoyle, 1995) and has a high negative correlation with competitive trait anxiety as found in Saferstein (1990). Building on these findings, Hoyle and Left (1997) examined the association of parental involvement (support and parental pressure) with enjoyment, performance, self-esteem, and other characteristics of young tennis players. Male and female players provided information about the role their parents played in their tennis game, their own view of their game, their self-esteem, and their state, regional, and national rankings. Players who reported a high level of parental support tended to report their greater enjoyment of tennis, viewed tennis as a more important part of their lives, and dropped less in state rankings than players who reported a lower level of parental support. In addition, parental support appeared to mediate the relations between several player characteristics. The data provided no evidence that parental pressure is an important influence on the participation and performance of young tournament tennis players. Côté (1999) described patterns in the dynamics of families of tal-

ented athletes throughout their development in sport. Four families, including three families of elite rowers and one family of an elite tennis player, were examined. Fifteen in-depth individual interviews were conducted with each athlete, parent and sibling to explore how they dealt with three types of constraints such as motivation, effort and resources. The results permit three phases of participation to be identified from early childhood to late adolescence: the sampling years, the specialising years, and the investment years.

Kay (2000) examined the central role played by the family in the development of children's sports talent, with particular emphasis on the practical ways in which families support children's excellence in sport. Interviews with 20 families from three sports (swimming, tennis and rowing) were used to investigate how the family provides support to young performers, and how they are affected by so doing. The findings showed that, in addition to providing essential financial resources, families' abilities to accommodate the activity patterns required by a particular sport are critical to children's participation. It is shown that a number of these factors are also likely to affect families' abilities to support their children's sport talent. Harwood and Swain (2002) investigated the effects of a player, parent and coach intervention programme on the goal involvement responses, self-regulation, competition cognitions, and goal orientations of three junior tennis players. First, each player reported their goal involvement, self-regulation, self-efficacy, and perceptions of threat and challenge prior to three ego-involving match situations. Aligned with a matched control participant, each treatment player, along with their parents and coach, were engaged in educational sessions and cognitive-motivational tasks over a three month competition and training period. Postintervention, positive directional changes were reported in all players except the control participant. This study reinforces for applied researchers and practitioners the importance and practicability of social-cognitive and task-based interventions designed to facilitate optimal, motivational, and psychological states in high pressure competitive situations. Gould et al. (1996) examined burnout in competitive junior tennis players. Content analyses of the 10 respondents' interviews identified mental and physical characteristics of burnout, as well as the reasons for burning out. Recommendations for preventing burnout in players, parents and coaches were also gleaned. It is obvious that the success of the player parents tennis coach triangle influences the successful development and progress of a player. In such a triangle each plays their own role and this article poses the question: How do male and female players of different age categories assess the behaviour and actions of their fathers, mothers and tennis coaches? The results will no doubt attract the attention of all those who play

important roles in the game of tennis, namely parents, coaches and players.

In his research involving young tennis players, Šporn (2002) tried to find out whether parents and the tennis coach exerted any psychological pressure on players. He established that parents exerted greater psychological pressure on their sons than on their daughters, that fathers' psychological pressure on their children was stronger than that of mothers, and that 12 year old boys regarded the coach's behaviour as psychological pressure. In terms of age, it was established that 12 year old boys felt greater psychological pressure than girls, that 16 year old girls felt stronger psychological pressure from their father, mother and tennis coach, that 12 year old boys felt greater psychological pressure from their coach than 16 year old boys and that parents' psychological pressure is regarded as the strongest by 16 year old boys.

AIM OF THE STUDY

The aim of the study was to provide answers to the following questions:

1. Do boys and girls assess their father's, mother's and tennis coach's behaviour differently?
2. Do boys and girls of different age categories assess their father's, mother's and tennis coach's behaviour differently?

METHODS

Subjects

The sample included 96 male and 96 female players classified in three age categories. The first age category (U12) consisted of 32 boys and 32 girls between 11 and 12 years of age. The second age category (U14) included 32 boys and 32 girls aged 13 and 14, while the third category (U16) was composed of 32 boys and 32 girls between 15 and 16 years old. They were all ranked on the national ranking list and practiced regularly. The period of training differed by age group, namely: boys U12 2.67 ± 1.01 years; girls U12 2.45 ± 1.21 years; boys U14 3.24 ± 1.82 years; girls U14 3.26 ± 1.96 years; boys U16 4.59 ± 1.69 years; girls U16 4.32 ± 1.87 years.

Procedure

All male and female players filled in three questionnaires of the closed type, which referred to assessments of their parents' and coaches' behaviour and/or indirectly to their perception of psychological pressure. The questionnaire was based on Loehr's and Kahn's questionnaire (1989) which was designed for estimating parents' behaviour. It was intended for the surveying of parents and for producing a quarterly parental (coach) report card. The questionnaire was translated into Slovenian and the terminology adapted to suit Slovenian male and female players. The source did not provide any information on the validity of the questionnaire. The parents' questionnaire (separate for father and mother) included 21 statements (variables: GF1-21; BF1-21 and GM1-21; BM1-21), while the coach was assessed based on a questionnaire containing 20 statements (variables: GC1-20 and BC1-20). The players selected answers using a 5 point Likert scale. A Likert scale measures the extent to which someone agrees or disagrees with a question. The most common scale is 1 to 5. Often the scale will be 1 - strongly disagree, 2 - disagree, 3 - not sure, 4 - agree and 5 - strongly agree. The final result of the questionnaire is the sum total of points assigned to each question separately for the father, mother and coach. The maximum score regarding the father and mother was 105 points and the minimum 21, while for the coach the maximum score was 100 and the minimum 20 points. Parents' behaviour is assessed on the basis of the total score. Those fathers and mothers achieving between 21 and 42 points are considered to be "adequate tennis parents" (i. e. performing well), those achieving between 43 and 63 are "slightly problematic" while those achieving between 64 and 105 points are "problematic parents".

First, descriptive statistics parameters were calculated for all variables by gender: mean value, standard deviation, minimum, maximum, skewedness, kurtosis and the Kolmogorov-Smirnov test for normality.

An analysis of variance (ANOVA) was used to compare the assessments of the father's, mother's and coach's behaviour between genders and then the assessments of behaviour were compared between the three age categories (U12, U14, U16). The tables of results show the mean value, standard deviation, F coefficient and the level of F coefficient statistical significance.

RESULTS

Descriptive Statistics

TABLE 1

Basic statistical parameters for boys

Age category	Variable	Min.	Max.	Mean	Std. deviation	Skewedness	Kurtosis	K-S	Sig. K-S
U12	B12E-FATHER	22	76	36.39	13.383	1.041	.942	.857	.413
	B12E-MOTHER	21	70	29.71	11.326	2.334	5.843	1.230	.083
	B12E-COACH	25	71	37.94	11.171	1.194	1.221	.846	.428
U14	B14E-FATHER	23	54	33.10	7.422	.714	.412	.529	.917
	B14E-MOTHER	21	47	27.94	6.449	1.312	1.664	.887	.371
	B14E-COACH	24	52	35.19	6.695	.313	-.188	.757	.570
U16	B16E-FATHER	24	71	38.00	10.000	1.271	3.162	.554	.887
	B16E-MOTHER	21	53	28.93	7.659	1.759	3.693	.876	.348
	B16E-COACH	23	54	35.57	8.487	.605	-.172	.536	.908

An analysis of the basic statistical parameters for boys reveals some deviations in certain variables of skewedness and kurtosis, namely: in mother's assessments in the U12 category (B12E-MOTHER), in mother's assessments in the U14 category (B14E-MOTHER), in father's assessments in the U16 category (B16E-FATHER)

and in mother's assessments in the U16 category (B16E-MOTHER). In all of the above stated variables the assessments showed the peak dispersion and an asymmetry to the left as well as the deviation of entities towards higher assessments. A test of the normality of distribution of individual variables showed the normal distribution of all variables.

TABLE 2

Basic statistical parameters for girls

Age category	Variable	Min	Max	Mean	Std. deviation	Skewedness	Kurtosis	K-S	Sig. K-S
U12	G12E-FATHER	21	44	29.43	5.224	.988	1.021	.911	.339
	G12E-MOTHER	21	34	25.37	3.634	.898	.180	.899	.355
	G12E-COACH	24	47	33.43	5.894	.410	-.498	.709	.650
U14	G14E-FATHER	21	71	32.39	9.820	2.013	6.513	.758	.568
	G14E-MOTHER	21	47	27.33	6.198	1.263	1.831	.881	.380
	G14E-COACH	25	52	35.79	7.288	.449	-.810	.879	.384
U16	G16E-FATHER	23	69	37.17	12.384	.935	.540	.619	.793
	G16E-MOTHER	22	60	31.54	8.723	1.518	3.604	.671	.708
	G16E-COACH	23	59	38.92	8.667	.346	-.102	.446	.978

An analysis of the basic statistical parameters for girls reveals some deviations in certain variables of skewedness and kurtosis, namely: in father's assessments in the U14 category (G14E-FATHER), in mother's assessments in the U14 category (G14E-MOTHER) and in mother's assessments in the U16 category (G16E-

MOTHER). In all of the above stated variables the assessments showed a peak dispersion and an asymmetry to the left as well as the deviation of entities towards higher assessments. A test of the normality of distribution of individual variables showed the normal distribution of all variables.

Comparison of assessments of fathers', mothers' and tennis coaches' behaviour by gender between all age categories

TABLE 3

Comparison of assessments of fathers', mothers' and tennis coaches' behaviour by gender between all age categories

Parent/Coach	Sex	Mean	Std. deviation	F	Sig.
E-FATHER	Boys	35.76	10.652	3.975	.048
	Girls	32.69	9.769		
E-MOTHER	Boys	28.86	8.695	.788	.376
	Girls	27.82	6.720		
E-COACH	Boys	36.26	8.975	.112	.738
	Girls	35.84	7.499		

First we were interested in whether boys and girls of all age categories assess their fathers', mothers' and tennis coaches' behaviour differently and whether they consider it to be psychological pressure. Based on the results of the analysis of variance it may be established that statistically significant differences in the assessments of parents' and tennis coaches' behaviour between boys and girls were only seen in fathers (TABLE 3).

Comparison of assessments of fathers', mothers' and tennis coaches' behaviour between age categories

TABLE 4

Comparison of assessments of fathers', mothers' and tennis coaches' behaviour between age categories

Parent/Coach	Age category	Mean	Std. deviation	F	Sig.
E-FATHER	U12	32.97	10.725		
	U14	32.73	8.680	4.068	.019
	U16	37.62	11.058		
E-MOTHER	U12	27.57	8.678		
	U14	27.63	6.278	1.970	.143
	U16	30.13	8.191		
E-COACH	U12	35.72	9.184		
	U14	35.50	6.958	.620	.539
	U16	37.12	8.652		

The assessments of fathers', mothers' and tennis coaches' behaviour were compared between the three age categories U12, U14, and U16. Based on the results of the analysis of variance it may be established that statistically significant differences in the assessments of fathers', mothers' and tennis coaches' behaviour between different age categories were again seen only in fathers (TABLE 4).

DISCUSSION

A comparison of the assessments of parents' and coaches' behaviour between genders on the basis of the results of the analysis of variance (TABLE 3) revealed statistically significant differences only in fathers. An analysis of players' individual answers showed that the reason for these differences lies in the father's inappropriate behaviour. Consequently, players do not feel at ease in terms of performing to their best abilities when their fathers are present at a match. The inappropriate behaviour of fathers may result in a player's poor performance that does not correspond to their actual abilities and skills. It may be concluded that players regard their fathers as people who do not support their children when they fail or face difficulties, attributing the highest importance to tennis and interfering too much in the game. Since it is relatively easy to recognise the above attitude during a match, one can only imagine what kind of pressure fathers exert outside the tennis court, reflected in constant talking about tennis, setting high performance criteria and ignoring other activities that are vital to a child's development (schooling, other activities, social life, etc.).

In our opinion such behaviour of fathers triggers various reactions in male and female players. Whether players regard their father's behaviour as psychological pressure depends primarily on the father's behaviour, namely, to what extent and in what way they express their views and requests related to tennis. As regards players' comprehension of behaviour or psychological pressure, it all depends on the player's mental maturity and ability to withstand psychological pressure.

As regards average assessments (TABLE 1 and 2) it may be established that boys of the U12 and U14 categories also assess their mothers' and tennis coaches' behaviour as disturbing since their respective total scores are higher than those of girls. Boys achieved higher values, thus leading to the conclusion that they also felt greater psychological pressure. We believe that the reasons for these differences between boys and girls also lie in the greater mental maturity of female players since, by the age of 14, they are ahead of boys because their puberty has started earlier. Both physical and mental maturity may offer a totally different perspective on parents' and coaches' behaviour and actions, which probably means that resistance to psychological pressure and negative effects in girls of this age is substantially higher. Šporn (2002) also established that parents exerted greater psychological pressure on their sons than daughters, that fathers' psychological pressure on their children was stronger than that of mothers and that 12 year old boys regarded their coach's behaviour as psychological pressure.

A comparison of assessments of parents' and coaches' behaviour between age categories on the basis of the results of the analysis of variance (TABLE 4) revealed statistically significant differences in fathers. It can again be established that the father is the person whose behaviour is comprehended differently by female and male players of different age categories. Why fathers were given such different assessments may be explained by the fact that female and male players of the U16 category predominantly saw their fathers' behaviour as problematic. This in itself does not have to be considered negatively because a comparison of the average values (TABLE 4) reveals that these values increase from the lower to higher age groups in all - fathers, mothers and coaches. A specific trend may thus be established, namely, psychological pressure from parents and tennis coaches on male and female players increases with age. This may mean that parents and tennis coaches who are involved in the process of developing male and female players take tennis increasingly seriously and, consequently, their criteria become stricter and their approach more serious and focused on competition results. Such an approach may - if adequately dosed and managed - positively affect and stimulate a player's development as it enables the exploiting of all potential needed for progress and success in tennis. The study by Šporn (2002) established that 12 year old boys felt greater psychological pressure than girls, that 16 year old girls felt stronger psychological pressure from both parents and their tennis coach, that 12 year old boys felt greater pressure from their coach than 16 year old boys and that parents' psychological pressure was regarded as the strongest by 16 year old boys.

CONCLUSIONS

Young male and female tennis players often perceive the actions and behaviour of their parents and coaches as negative and disturbing, a finding also made in the Saferstein research (1990). We were primarily interested in whether there are specific differences in the assessments of parents' and coaches' behaviour between genders and different age categories. This study did not reveal whether the parents' and coaches' behaviour should raise concern. Nevertheless, this area is exceptionally important and still insufficiently researched; it is difficult to provide unequivocal answers to the questions relating to parents' and coaches' influence on athletes' development - in our case, male and female tennis players.

It is recommended to pursue a joint action project: player parents tennis coach, which basically points to a potential solution to the problem of the inappropriate actions and behaviour of parents and tennis coaches

(Harwood & Swain, 2002). With the aim of ensuring more humane and child-friendly sports development, a programme for training tennis coaches would have to incorporate information related to the suitable treatment of male and female tennis players at a particular age, with an emphasis on the youngest, while the training and awareness-raising of parents about their importance and their roles in the development of young male and female tennis players will have to start being implemented through tennis clubs.

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APPENDIX 1

Questionnaire about the parents

- F1/M1 My father/mother only sees success in victory.
 F2/M2 My father/mother interferes with my tennis too much.
 F3/M3 Regarding tennis, my father/mother demands too much of me.
 F4/M4 When I fail, my father/mother speaks too much about the good points of the opponent.
 F5/M5 My father/mother is too critical of my tennis.
 F6/M6 My father/mother punishes me if I lose.
 F7/M7 My father/mother forces me to play tennis too much and does not consider my other interests.
 F8/M8 My father/mother does not get along well with other players' parents and disagrees with them.
 F9/M9 My father/mother does not support me when I fail.
 F10/M10 My father/mother is irritable if I do not play well.
 F11/M11 My father/mother does not communicate with the coach.
 F12/M12 My father's/mother's presence at a match disturbs me.
 F13/M13 My father/mother demands success too quickly.
 F14/M14 My father/mother leaves the court if I do not play well.
 F15/M15 My father/mother always talks about tennis.
 F16/M16 My father/mother gives priority to tennis over school work.
 F17/M17 My father/mother says tennis is the most important thing.
 F18/M18 During a match, my father/mother makes non sport like and loud comments.
 F19/M19 My father/mother insults me out loud when I make a bad move during a match.
 F20/M20 When I fail my father/mother reproaches me with how much they spend on my tennis.
 F21/M21 My father/mother praises me excessively in front of other parents.

Key: F - father
 M - mother

APPENDIX 2

Questionnaire about the tennis coach

- C1 My coach communicates too critically with my parents.
 C2 My coach devotes too much attention to a single player from our club (they are his/her "favourite").
 C3 My coach demands too much from me at practice.
 C4 My coach demands too much from me at a tournament.
 C5 My coach does not support me when I fail.
 C6 My coach's instructions during a match disturb me.
 C7 If I perform badly at practice my coach punishes me.
 C8 My coach is present at my tournaments.
 C9 My coach's presence at a tournament disturbs me.
 C10 My coach is convinced that they are the only one who contributed to my victory.
 C11 After the match my coach only analyses my bad points.
 C12 When I play badly my coach talks and behaves in an uncontrolled manner.
 C13 My coach often does not react to my victory or defeat.
 C14 My coach often says: "We are playing today", as if they were also on the court.
 C15 It bothers me if my coach records a match or makes notes during it.
 C16 My coach "dreams" of me becoming a professional player some day.
 C17 When I fail my coach speaks too much about the good points of the opponent.
 C18 My coach does not pay attention to me being tired because of my other obligations and activities.
 C19 My coach finds practice more important than my school obligations.
 C20 My coach does not consider my wishes during practice.

**SROVNÁNÍ HODNOCENÍ CHOVÁNÍ RODIČŮ
A TRENÉRŮ U TENISTŮ A TENISTEK
RŮZNÝCH VĚKOVÝCH SKUPIN**
(Souhrn anglického textu)

Tenis je určitě jednou z těch sportovních her, v nichž je úspěch ovlivňován psychologickými schopnostmi. Během celé své sportovní dráhy jsou obvykle tenisoví hráči vystaveni psychologickému tlaku. Cílem této studie bylo zjistit, jak mladí tenisoví hráči hodnotí chování (psychologický tlak) a aktivitu své matky, otce a tenisového trenéra. Vzorek zahrnoval 96 tenistů a 96 tenistek náležejících do třech věkových kategorií, kteří vyplňovali tři dotazníky uzavřeného typu. Údaje byly zpracovávány v souladu s výzkumnými cíli.

Pro všechny proměnné byly podle pohlaví vypočítávány popisné statistické parametry: střední hodnota, standardní odchylka, minimum, maximum, šikmost, špičatost a Kolmogorovův-Smirnovův test normality. Pro srovnávání hodnocení chování hráčova otce, matky a trenéra podle pohlaví a posléze pro srovnávání tří věkových kategorií (U12, U14, U16) byla použita analýza variance (ANOVA).

Srovnávání hodnocení chování otce, matky a trenéra podle pohlaví odhalilo statisticky významné rozdíly pouze u hodnocení otce. Při srovnávání hodnocení chování obou rodičů a trenéra podle věkových kategorií byly statisticky významné rozdíly stanoveny opět pouze u hodnocení otce.

Klíčová slova: tenis, junioři, tlak rodičů a trenéra.

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THE PHYSICAL ACTIVITY AND MENTAL HEALTH RELATIONSHIP - A CONTEMPORARY PERSPECTIVE FROM QUALITATIVE RESEARCH

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There is a known positive relationship between physical activity and mental health, and in the treatment and maintenance of mental illness. Despite this relationship however, there still remains a lack of consensus on the mechanism responsible for the relationship. This paper explores the physical activity and mental health relationship by reviewing and critiquing the biochemical, physiological and psychological mechanisms proposed to explain this phenomenon. Through this review it becomes apparent that although there are varied explanations proposed, there is little agreement except that the relationship is complex and the responsible mechanism(s) are likely to be interrelated combining the disciplines of psychology, biochemistry and physiology. In an attempt to understand further the complexities of the relationship the paper presents findings from qualitative research that investigated the relationship from the perspectives of people that experience mental health benefits from exercise. Using grounded theory methodology the study investigated the experiences of participants on exercise programmes in the UK. The paper concludes that qualitative methodologies which explore people experiences, and what helps to facilitate them, provide further insight into the interrelated nature of the physical activity and mental health relationship.

Keywords: Physical activity, mental health relationship, qualitative research.

INTRODUCTION

There is a substantial body of evidence that shows a positive relationship between physical activity and mental health and illness (Biddle et al., 2000; Biddle & Mutrie, 2001; Callaghan, 2004; Daley, 2002; Fontaine, 2000; Saxena et al., 2005). The substantial evidence linking physical activity to mental health has resulted in recommendations for exercise to be used as an adjunct to other forms of treatment in mental illness (Biddle et al., 2000; Burbach, 1997; Daley, 2002). As a consequence the publication of UK practitioner guidelines for people working in mental health services (Grant, 2000) has resulted in physical activities being developed within mental health services and with local leisure partners, within the UK. These recommendations were made despite uncertainty over the actual mechanism(s) by which physical activity affects mental health. Several mechanisms have been suggested and come from a variety of disciplines including biochemistry, physiology and psychology (Carless & Faulkner, 2003). However the mechanism responsible for the relationship remains open for debate (Biddle & Mutrie, 2001). This lack of consensus may be because researchers have focused their research on establishing a relationship, rather than investigating why a particular incident, experience

or situation is important to the participant (Fox, 2000; Marsh & Sonstroem, 1995). Additionally, this area of research is currently dominated by positivist approaches and as a consequence, there are suggestions that an integrated psycho-physiological model may provide more insight into the relationship (Boutcher, 1993; Mutrie, 2000). In support of this suggestion some researchers have investigated peoples experiences of participating in exercise (e. g. McAuley et al., 1991; Wankel, 1993; McAuley et al., 1995; Turner et al., 1997; McAuley et al., 1999; Hardcastle & Taylor, 2001). Research investigating experiences and the interactions that this involves with other people and the environment may help to develop a deeper understanding into the physical activity and mental health relationship (Fox, 2000). Existing qualitative research within the exercise environment has highlighted the importance of:

- social support, social norm and social interaction to participants' positive experiences (Faulkner & Sparkes, 1999; Hardcastle & Taylor, 2001; Stathi & Fox, 2004),
- social constructs to mental health (Morrissey, 1997; Singh, 1997),
- and for exercise adherence (Smith & Biddle, 1999).

Some qualitative work has investigated perceived mental health outcomes with people with mental health problems, for example Faulkner and Sparkes, (1999), Fogarty and Happell, (2005). However, despite Mutrie's (1997) call for qualitative work concentrating on investigating the physical activity and mental health relationship (the phenomenon), there has only been one paper to date (Crone et al., 2005) that has addressed this. As a consequence, the aim of this paper is to review the current body of knowledge regarding the physical activity and mental health relationship and in response to Mutrie's (1997) calls for qualitative work in this area, concludes with an alternative perspective on the relationship from a qualitative study undertaken in the UK. It therefore presents a contemporary perspective on the physical activity and mental health relationship for consideration within this current debate.

A review and critique of proposed mechanisms

Research investigating the mechanisms by which exercise exerts its effect on mental health has not been extensively studied and are consequently not fully understood (Craft, 2005). Currently, the proposed mechanisms for the physical activity and mental health relationship fall into three main areas, biochemical, physiological and psychological. There is also a complementary body of knowledge that has not been previously proposed as responsible for the relationship but the authors of this paper have included it because they believe that it is related to the relationship due to its complex and apparent interrelatedness.

Two biochemical mechanisms are reported in the literature; the endorphin hypothesis and the monoamine hypothesis. The endorphin hypothesis originated from marathon runners experiencing a feeling of euphoria or high after long distances. It states that the production of endogenous opioid peptides (endorphins), in the brain produces a morphine like effect which reduces the sensation of pain and provides a state of euphoria (Hoffman, 1997; Paluska & Schwenk, 2000). Much of the research on this hypothesis has been on animals, due to the need to measure brain based endorphin levels but this design creates difficulties when transferring it to human subjects (Daley, 2002). Although some research has been conducted with humans, Markoff et al. (1982) have some concerns regarding this hypothesis; notably that high intensity levels of exercise are required to release endorphins and feelings of euphoria from exercise have been experienced at lower levels of intensity.

The monoamine hypothesis proposes that exercise enhances the brains aminergic synaptic transmission (nor adrenaline, dopamine and serotonin) which affect arousal and attention (Chaouloff, 1997; Faulkner & Carless, 2003; Ransford, 1982). However there is little

published research on this and the hypothesis has been criticised for being oversimplified (Dunn & Dishman, 1991) and unclear, given the lack of definitive understanding of the role serotonin has on psychological function (Faulkner & Carless, 2003).

There are two physiological mechanisms that include an improvement of physiological functioning with a link to mental health from epidemiological studies (see Biddle, 2000 for a review) and the thermogenic hypothesis (Morgan & Goldston, 1987). The link between physiological functioning and an improvement in psychological health is evident in epidemiology but in experimental studies there have been improvements in psychological health without a change in physiological status (Faulkner & Carless, 2003). The thermogenic hypothesis states that temperature rises through exercise are responsible for mood enhancement (Morgan & Goldston, 1987). According to Daley (2002) this hypothesis was developed from the notion of saunas and warm showers, and their perceived benefits. There is little support for this hypothesis however because many studies have failed to show a relationship between exercise, increased temperature and psychological state (Biddle & Mutrie, 2001; Daley, 2002; Nicoloff & Schwenk, 1995).

The psychological mechanisms include the distraction hypothesis, self-efficacy theory, mastery and social interaction. The distraction theory (Bahrke & Morgan, 1978) proposes that time away, or out of, daily life that physical activity can bring, is responsible for the benefits derived from exercise. Boutcher (1993) also stated that activities such as yoga and psychotherapy had similar effects. There is little support that this mechanism is responsible for chronic bouts of activity but Paluska and Schwenk (2000) suggest that this mechanism may be responsible for the antidepressant affects from an acute (one off) bout of exercise. Craft (2005) also supports this conclusion in her recent research investigating the effect of exercise on women with depression.

The self-efficacy theory (Bandura, 1997) proposes that an individual's confidence to exercise is strongly related to their ability to perform the behaviour. Therefore the successful adoption of exercise may lead to increases in mood, self confidence, a sense of ability or self efficacy, which impacts on a persons autonomy and their ability to cope with life (Craft, 2005; Faulkner & Carless, 2003; Paluska & Schwenk, 2000). This hypothesis links very closely with the mastery hypothesis (Greist et al., 1979) which proposes that by overcoming a challenging exercise related task there is an elevation in independence, success and a sense of control. It is suggested that these feelings transpose themselves into everyday life and improve mental health, generally. The closeness of these two hypotheses suggests that no one mechanism is responsible for this complex relationship.

The social interaction hypothesis (Ransford, 1982) proposes that social relationships and mutual support from other people in an exercise setting provides a significant proportion of the effect of exercise on mental health. However, there are mixed responses to this hypothesis because research into home based and community programmes have found social interaction to be unnecessary for the elicitation of mental well-being (Glenister, 1996). However, according to Biddle and Mutrie (2001), for some socially excluded groups, such as older people or people with depression, the opportunity for social interaction may be particularly important for their mental health.

Biddle and Mutrie (2001) conclude that consensus on the mechanism responsible for physical activity and a mental health benefit is still inconclusive and unclear. Acknowledging that the relationship appears to be complex and interrelated with physiological, biochemical and psycho-social aspects, there is a growing body of research that has investigated the experiences of exercising and concluded that it appears to be the process of exercising, rather than the exercise per se, that is influential in reducing symptoms and improving well-being (Faulkner & Sparkes, 1999; Gauvin et al., 1996; Morrissey, 1997). Research has also investigated aspects within exercise environments that may be influential to the relationship. These have included the social comparison theory (Festinger, 1954) where people are compelled to compare themselves with others, social physique anxiety (Hart et al., 1989), where anxiety is experienced by people who are concerned about how other perceive their physique, and environmental influences, such as the social environment (McAuley et al., 1999). These factors surely must play a part in the experiences of people who exercise but have not been specifically examined in terms of the physical activity and mental health relationship.

The current body of research into the mental health and physical activity phenomenon is limited and hindered by the methodological difficulties of research into mental health, with, for example sample size, design and homogeneity of participants (Craft, 2005; Daley, 2002). Research has also been dominated by positivist perspectives but one study (Crone et al., 2005) has attempted to address the dearth of qualitative research and investigated the physical activity and mental health relationship from the perspectives of the participants who experience it. This research is summarised below to provide an alternative perspective on the relationship.

A contemporary perspective

Crone et al. (2005), using grounded theory methodology (Strauss & Corbin, 1998), have developed a conceptual framework that explains the physical activity

and mental health relationship from the perspectives of participants on exercise referral schemes. Exercise referral schemes are UK based programmes of exercise situated at local leisure facilities or fitness clubs. Participants access these schemes through a referral from their General practitioner or other health professional, such as a physiotherapist or dietician. Crone et al.'s (2005) research adopted the perspective that individuals produce and define their own understandings of the experiences (Tashakkori & Teddlie, 1998) and that interpretation of the social world is independent (Crotty, 1998). It accepts that to fully understand the effect of participation in exercise for a person's mental health it is necessary to investigate participant's perceptions and experiences.

Participants ($n = 18$, $m = 5$, $f = 13$, mean age 55.5 years, $s = 10.78$), from three exercise referral schemes were interviewed using focus groups and individual interviews. Participants had been referred by health professionals (typically the general practitioner) to the exercise schemes to address physical health concerns. None of the participants had a diagnosis of a mental health condition. The study therefore focused on the physical activity and mental health relationship for mentally asymptomatic individuals. Analysis included the six grounded theory strategies of simultaneous collection and data analysis, a coding process (open, axial and selective coding), comparative methods (focus groups and interviews), memo writing, purposive and theoretical sampling and the development of the conceptual framework (Charmaz, 2000). A summary of Crone et al.'s (2005) conceptual framework is discussed below.

The conceptual framework is centred around the core category, "self-acceptance". This category provides the participants conceptualisation of mental health and centred on respondents' acceptance of themselves, their health and social status, and life situation. The category provided participants with self assurance or confidence; for example "out on the bike I feel at one with the whole of life and the whole of creation (self-acceptance)... I feel that this is the extreme of what a human being can feel in pleasure and in being alive. I just love life and when you use everything, your body and your mind, to achieve the best then you get the best feeling" (Mary in Crone et al., 2005).

Self acceptance was influenced by four conditional themes, which represent a set of events that create situations relating to the core category (Strauss & Corbin, 1998). The conditions in Crone et al.'s (2005) conceptual framework were social support, social network, culture and environment.

Social support was the actual provision of support which was received from staff (both leisure and health), both formally through the professional roles and informally through their personal qualities and personalities.

Other exercisers were also givers of support and contributed to the supportive environment. Social support provided assistance with maintaining motivation and adherence, helping with confidence in the operation of fitness machines, and feeling at ease in an unfamiliar environment. Social support was facilitated through the social network. The social network included the type of scheme, the roles of the members of staff within the scheme, and the structure and protocol, or day to day workings, of the scheme. The culture theme was the atmosphere and social norms that existed within the exercise schemes. This was created by other exercisers and scheme staff and was perceived as a consequence of the behaviour patterns and attitudes of these individuals. Lastly, the environment theme was defined as the physical environment in which the exercise took place. The properties or components of this theme included the fitness equipment and the physical nature of the exercise facility, i. e. the changing rooms or the specific gym.

The conceptual framework also contains themes, described as actions, which include tactics on how people deal with different situations that they experience (Strauss & Corbin, 1998). There are three action themes including playing a role, coping mechanisms, and act of coping.

Playing a role involved social interaction and was a process whereby participants adopted a specific role or purpose within the social network of the scheme. This role included being a joker, an advocate, or a welcoming host to new scheme participants. The coping mechanism theme involved strategies that were employed by participants. Mechanisms included strategies to manage challenges such as reading exercise instructions due to poor eye sight, reducing boredom in the fitness room and coping with unpleasant factors, such as the dislike of an exercise, or use of an exercise machine. The act of coping theme included both the realization that involvement in the scheme required an ability to cope with the challenges that would be encountered, and a reliance on the scheme to facilitate coping in other aspects of life.

The conceptual framework concludes with three consequences themes which are outcomes that have resulted from the actions (Strauss & Corbin, 1998). These included a sense of belonging, a sense of purpose and physical health.

A sense of belonging is the feeling of being a part, or player, in the scheme and that it is an appropriate activity or pursuit for participants to be engaged in. A sense of purpose was derived from involvement in the scheme by having something to do and from knowing that participation in purposeful activity was beneficial. Physical health benefits included body composition changes, improved physiological functioning and a reduction in medication.

DISCUSSION

Researchers have suggested that the mechanism responsible for the physical activity and mental health relationship is complex and lies in a combination of biological, psychological and social factors (Biddle & Mutrie, 2001; Fontaine, 2000). Crone et al.'s findings would support this and further highlights the complex and interrelated nature of the relationship. For example, in Crone et al.'s (2005) framework self-acceptance (or the participants mental health) is affected by a number of factors, not solely the exercise "per se", but the physical and social contexts where the participants experiences are entrenched. Their study demonstrates that context related factors such as social network, environment, culture and social support are influential and related to the physical activity and mental health relationship for these participants. As a consequence Crone et al.'s (2005) findings provide further insight into the complexities of the relationship and of the factors that can effect it, in exercise settings. It also supports the use of interpretive methodologies in this under researched area of psychology.

For many health and exercise professionals physical activity programmes are perceived as a medium for changing people, physically, to meet an aesthetic ideal (i. e. before and after), or to achieve a physical fitness or health goal (e. g. losing fat or gaining strength). Interpretative research into exercise emphasises that the experience of exercising itself, irrespective of the outcomes it may lead to, is important. It suggests that exercise programmes have the potential to help people feel happy and content with who, and where they are now, not with who, or what, they may become in the future. Feeling good about yourself and being content are aspects of mental health that, according to Crone et al.'s research, can be influenced with successful participation on an exercise programme.

CONCLUSION

This paper, by critiquing the mechanisms provisionally presented to explain the physical activity and mental health relationship, acknowledges that the mechanism responsible is more complex and interrelated than those proposed from biochemistry, physiology and psychology would suggest. By acknowledging the interrelated nature of the relationship it concludes, through the presentation of findings from qualitative research, that there is a need for further research into this area. Research including methodological approaches from both interpretative and positive paradigms, needs to be developed if a full and definitive understanding is to be found to

explain the physical activity and mental health phenomenon. If physical activity is to continue to be used for the promotion of mental health and in the treatment of mental illness, the mechanism must be more fully understood to develop guidelines for practice that are not only based on evidence of an association, but also of the mechanism responsible for this association.

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VZTAH TĚLESNÉ AKTIVITY A DUŠEVNÍHO ZDRAVÍ - SOUČASNÝ POHLED KVALITATIVNÍHO VÝZKUMU

Pozitivní vztah mezi tělesnou aktivitou a duševním zdravím a jeho využití při léčbě duševních chorob jsou známy. Přesto stále nebylo dosaženo shody ohledně mechanismu, který je za tento vztah zodpovědný. Článek zkoumá vztah tělesné aktivity a duševního zdraví kritickým posouzením biochemických, fyziologických a psychologických mechanismů, které mají tento jev vysvětlovat. Z takového posouzení vyplývá, že přes různá navrhovaná vysvětlení panuje v této oblasti jen málo shody, s výjimkou toho, že jde o vztah komplexní a že v zodpovědném mechanismu či zodpovědných mechanismech se pravděpodobně navzájem kombinují prvky psychologické, biochemické i fyziologické. Pokus o lepší pochopení komplexnosti tohoto vztahu doplňují zjištění z kvalitativního výzkumu zkoumajícího vztah z pohledu osob, které prospěšný vliv cvičení na duševní zdraví zažívají. Pomocí metodologie kvalitativního výzkumu zjišťovala studie zkušenosti účastníků cvičebních programů ve Velké Británii. Závěrem je konstatováno, že kvalitativní metodologie zkoumající zkušenosti lidí a prostředky, které je usnadňují, poskytuje další pohled na složitou povahu vztahu tělesné aktivity a duševního zdraví.

Klíčová slova: tělesná aktivita, duševní zdraví, kvalitativní výzkum.

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Physical activity and mental health and exercise referral scheme evaluation.

AN ATTEMPT AT THE CHARACTERISATION OF THE DEVELOPMENT OF MODERN SPORTS GYMNASTICS

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The scientific verification, the synthesis and the analysis of practical as well as theoretical information provide us with a basis for assessing and formulating a number of factors which influence the development of sports gymnastics.

The aim of the article is an attempt at characterising the development of modern sports gymnastics. The following conclusions result from theoretical analysis of the literature which has been available for the last few years, the analysis of the training process of Ukrainian and Russian gymnasts, as well as my own experience gained both as a trainer and a competitor and a long-term researcher interested in our leading Polish gymnasts. The main developmental tendencies concern: an individual's attitude towards the training process, the intensification of the training, a faster mastering of the sports programs owing to the constant development of the methodology, the importance of physical training of the athletes, the unification of the training technology of the gymnasts who represent the advanced level, the improvement of the means which make the training work safer, and a scientific study of the main components of the training technology.

Keywords: Sports gymnastics, developmental tendencies, factors.

INTRODUCTION

The development of modern sports brings with it the necessity of constant unification of the recognition and determination of needs, which are the basis for the creation and the conduct of the long-term training process. The latest scientific research, supported by practical and theoretical knowledge, are indispensable. The synthesis and the analysis of different information provide the groundwork for assessing and formulating a number of factors which influence the development of varied sports disciplines.

For the last couple of years, a dynamic development of sports gymnastics has been observed. The development is caused by the increased level of difficulty of gymnastic programs, improved training technology and novelties in the training process, as well as even the level of sports competition. What characterises modern gymnastics is its direction by the International Gymnastics Federation towards the versatility of the exercises of different structural groups. There are many different factors which decide an athlete's success. The basic ones are training and inborn abilities, such as motor abilities, the right body build, morphological characteristics, and the character of the competitors (Bril, 1986; Hadzajew, 1993; Kums & Vain, 1997; Sawczyn, 2000; Zasada, 1993).

Making gymnastics programs difficult and the stability of their realisation means an increase in the intensity of training at every stage of the training process, which, in turn, can lead to exceeding the adaptive skills of the organism and endangering the athlete's health. Therefore, the modern training process requires some changes in the system of sports preparation based on the latest scientific achievements in this field. In order to understand the character of the above mentioned changes, analyses of the direction of developmental tendencies in sports gymnastics ought to be done.

The aim of the article is an attempt at determining the current developmental tendencies in male sports gymnastics.

METHOD

Characterisation of developmental tendencies in sports gymnastics was, for our purposes, based on theoretical analyses of the literature which has been available for the last few years, the analysis of the training process of Ukrainian and Russian gymnasts, as well as on my own experience gained both as a trainer and a competitor and long-term researcher interested in the leading Polish gymnasts.

RESULTS

The term “developmental tendencies” is exceptionally broad. Not only should it be understood as the development of gymnastics as a sports discipline, but also as the development of techniques and sports devices as well as the aspiration to specify the type of an “ideal gymnast”. The term should also be understood as referring to the theoretical and methodological tasks of the long-term process which determine the directions of cognitive actions (Sawczyn, 2000).

At present, male gymnastics differs a lot from how it was in the sixties. Among many factors which have influenced it one can find the following: the introduction of the obligatory free style exercise into tournaments, as well as the introduction of all the novelties which make gymnastic programs more complex. Modern gymnastics is oriented towards the multi-discipline contest, which has influence not only on the versatile development of motor abilities, but also on the very high level of all requirements connected with the training process of a gymnast (Sawczyn, 1998). One has to mention here the factor of the level of difficulty of the exercises during the competition, which requires from the competitor a high level of physical preparation and efficiency. Owing to the considerable complexity of the gymnastic programs and the training, the factor of the athlete's health has to be taken into consideration. The increasing importance of the regulation of the training process in gymnastics is closely connected with the tendencies one can observe in training technology. The changes are determined by the overall development of modern gymnastics (Sawczyn, 2000).

Therefore, the analysis of the tendencies in the development of modern gymnastics shows that the basic concern of the training process is the constant improvement of technology and technique, especially of those well qualified. It applies especially to the right combination of the technique which is used during the training process and the regulation of the training loads.

Based on the compilation of the knowledge gained as the result of long-term, broad scientific research, the 12 following factors have been determined. These are the factors which influence the condition of modern gymnastics and its development.

1. Bringing technical mastery to the level of virtuosity by an increase in starting preparation and its intensification. It needs to be emphasised here, that there are a number of people who influence it: trainers, physiologists, psychologists, nutritionists, choreographers and even referees.
2. The constant search for new, more complicated exercises. It is not only about adding another turn to the acrobatics, but doing them around different axes and with new positions of the body. Using the principle of coherence between better results obtained by the champions, the level of difficulty of the exercises and the limitation of the time of the training process. This solution requires using universal methods and optimal measures in order to maintain the level of exercises at the highest level.
3. Modern, fast and effective regeneration within the framework of the training infrastructure. Regeneration plays an important role in gymnastics. During the exercises the muscles are constantly tense, the exercises are repeated. The muscles and joints wear out, which can result in numerous micro injuries that should be eliminated or weakened by deliberate and systematic regeneration using the latest technologies.
4. The increased importance of specific sports training, as well as the accelerated process of the training owing to the advances in methodology. The process of teaching in gymnastics, which occurs in a training unit, is an indispensable part of the training. In order to comply with the requirements, an athlete must master new, more complicated elements and exercises using the sports devices, and the rate at which he or she masters it is closely related to the methodological abilities of his or her trainers.
5. The standardisation of the technology used in sports training at a very high level as a result of the rapid spread of scientific and methodological knowledge. One of the most important elements of standardisation is the information included in the programs, and communicated at various scientific and methodological conferences, during which different problems are discussed and many solutions to them are proposed. This is a very important element, which is necessary for the further development of gymnastics in Poland.
6. Making use of the individual approach towards planning and programming the process of sports training as well as correct proportions of the training are one of the most important factors in the training process in sports gymnastics. One has to mention here the individual approach towards the athletes, the complex control of their physical condition and their skills and abilities at every stage of training. The control of individual parameters of the training loads is indispensable here. The most informative are the following: the overall number of elements which are done, the number of combinations (configurations of the exercises) using the sports devices, the time of the training, the number of elements in the specific training session (PFS), the number of elements at the highest level of difficulty, the percentage of the correctness of the combinations using sports devices as well as jumping over the vaulting horse. The more the training is carefully considered and planned towards the individual needs of each

athlete, the greater chances of obtaining positive effects at a sports event.

7. Making it possible for an athlete to take part in sports events. The aim of this factor is assessment (by systematic test), and the control and verification of the initial condition of an athlete including the mastering of immutable habits. The basic elements of the preparation are the following: a specific efficiency as a symptom of the adaptation of the body to a specific physical and psychological effort as well as the improvement of concentration and emotional balance. It must be emphasised here, that sports events are not only a test of the athlete's psyche, but also aim at making him or her resistant to various stressful situations in which they can find themselves during sports rivalry.
8. The proper, multistage training of the gymnasts for the highest level and the confidence to practise certain elements and combinations of the exercises. This factor is inseparably connected with the proper planning of the training. If an athlete becomes acquainted with the new elements, combinations and configurations early enough, if he or she has enough time to practise them and, above all, to master them and eliminate any errors, it can be expected that they will become confident in doing the exercises and will be successful in the sports event which is to follow. The results of the action are the following: intensive training, mastering technique, efficient managing of all parameters of the training load and the system of criteria of training guidance as well as individual models of sports preparation of gymnasts. The complexity of solving these tasks results from the fact that the elements presented here are formed throughout many stages of the training process and its global techniques constitute the final result.
9. The disappearance of the differences between the periods of the year long training cycle especially observed in the shortening and reduction of the transitional periods, which is a negative factor in developmental tendencies, not only in gymnastics, but also in other sports disciplines. Hard training throughout the year, stressful situations during sports events, all this weakens the athletes both physically and mentally. As many doctors and psychologists claim, each athlete should take a break from training and use the time for intensive regeneration and relaxation during specially organised camps.
10. Developmental tendencies also mean intensive scientific analyses of the main components of the training technology, training simulators and technical means of training guidance. World sport is becoming more and more well-considered, improved and advanced by a number of scientists who take care of the proper course of the training and the development and progress of an athlete. It also concerns the whole group of people who support gymnastics technically. These are groups of experts who specialise in the improvement of the sports devices with which the athletes work. This may include work on the material the devices are made of, their construction, as well as the invention of new training simulators which can make the athlete's and the trainer's work easier. One has to mention here the psychologists, physiologists and the doctors who influence the creation and performance of a number of tests which aim at determining the physical and mental condition of the athletes. These include general tests which are widely used as well as specific tests which are for gymnasts only.
11. The improvement of all the factors which may decide about successful training work are, i. e. financial, material, technical, methodological, motivational and many others which can create the basis for good results. I think that the lack of financial resources has been a permanent problem for many Polish sports disciplines. With regard to the fact of how important material and technical security is, it is desirable to remember about biological and methodological security which, de facto, depends on material security. It has been stated that this developmental factor in gymnastics is characterised by an upward tendency and let it remain so.
12. The last factor is the common centralisation of the preparation of the national teams. For example, in one of the best teams in the world, i. e. the Russian and Ukrainian teams, it is determined by the relation 7 : 1 : 2, where 7 is the central preparation, 1 - the training place, 2 - taking part in sports events. The important factor which influences the above mentioned developmental tendencies is the commercialisation of international gymnastics and the unification of the systems of sports preparation of the gymnasts who are dominant in this sports discipline. As one of the signs of uniformity of the preparation system one can include the transition to year long training with a huge part of centralised work, with often one day training using strategic means of physical and technical preparation. The content of individual programs also includes unifying tendencies. Generally accepted preparations with the use of much physical and mental load concern not only national teams, but also a large group of reserve athletes. During the training it is common to model stressful situations which are typical of the conditions during the sports event.

Apart from the above mentioned factors, many researchers whose work it is to verify and determine the modern direction of the development of this sports

discipline, like (Kochanowicz, 1998), claim that the development of gymnastics and, above all, the increase in technical abilities is twofold. On the one hand it is a subject of interest for the press, a number of experts and research institutes. It is caused by high achievement. The constant accumulation and the selection of experiences is done where the champion's achievement, the theory of the training and sports medicine meet. On the other hand, another way to progress in gymnastics – which is more rarely noticed and analysed, and where most of the phenomena seem to be sheltered from scientific observation – is the popularisation of higher standards of technology and sports efficiency and adopting a new cultural model (overcoming mental barriers). Some time ago, doing a free back somersault (with the trunk upright) was all a gymnast could think of. Today young adepts of the discipline infrequently do double free back somersaults with turns around the longitudinal axis. The elements which are accessible to most gymnasts these days, were impracticable a dozen or even a few years ago... It shows that apart from human abilities there are also some mental barriers which define how much and how fast something can be achieved and what exercises and combinations an athlete can do. It suddenly turns out that one can jump in a different way, and the acrobatic elements can be done with turns around different axes. Of course, it includes the overall increase in dexterity, agility, hygiene, as well as quantitative and qualitative increases and the psychophysical predisposition of a gymnast. The mastering and verification of the methods which are used make it possible to achieve mastery among most gymnasts, as well as to bring them closer to the athletes who represent the highest sports level. While analysing the considerations above, one can assume, that the best gymnasts in the world modify the basic rules of sports preparation, introduce new rules and determine new requirements for training loads. One has to mention here the acquisition of new, extremely difficult and complicated combinations. This principle requires a constant revision of sports programs and increased difficulty of the exercises which are done, while taking into consideration the latest developmental tendencies in gymnastics. Apart from this, many gymnasts are characterised by a constant readiness to take part and show their skills and abilities at sports events, or during model and control training or gymnastic shows. This principle leads to reaching a high level of functional stability and doing the exercise in a masterly fashion (Smolewskij & Gawierdowskij, 1999).

The technology of sports preparation of the gymnasts who represent the highest level assumes that sports and technical results as well as normative indexes should be obtained at all stages of the long-term preparation (Arkajew & Suczilin, 1997). The methodological basis for the preparation of highly qualified athletes constitutes, on the one hand, a long-term and prognostic attitude (Suczilin, 1980, 1989), and on the other hand, the principle of outpacing development. It is realised by eliminating the unwanted elements of the training process. The main part of the principle is to outpace the planned difficulty, the quality and the confidence of the exercises that are done during the sports events (Arkajew, 1994). It also makes it possible to outpace physical and emotional development (Sawczyn, 2000).

The functional excess which is used and developed in sports by dosing the sports loads (the amount and intensity), as well as the use of training and supplementary means, all these exceed the work which is done during the competition, based on which an optimal excess should be created, including the quality of its realisation, initial endurance, and physical and mental preparation. It can be done on the basis of creating the models of the sports preparation of the gymnasts and the methods of their achievements.

What is described as a model in sport is usually a collection of factors which guarantee the achievement of a certain level of mastery and the expected results. Looking at the model of the top athletes, sports activity is in first place. It can potentially guarantee the highest results and their stability. One of the main conditions which can decide about getting good results is the high level of the preparation factors. It is assumed that model characteristics lead to eliminating imperfections in the athletes' preparation, forming physical features which are not so well developed and reaching the level of sports mastery. The principle of the importance of the individual features and abilities is vital for sports gymnastics. In this discipline the individual skills and abilities are improved in the particular sports activity of the multi-discipline event. This is what makes the preparation in gymnastics different from other sports disciplines (Czeburajew & Kaczajew, 1986; Czeburajew & Arkajew, 1997).

The analysis of tendencies has shown that the improvement of training technology is the basic task of the training process, especially with regard to highly qualified athletes. It is high qualifications which result from effective, long-term training, in which one can see many issues that can be a subject to further scientific research.

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**POKUS O CHARAKTERIZACI VÝVOJE
MODERNÍ SPORTOVNÍ GYMNASTIKY
(Souhrn anglického textu)**

Vědecké ověřování, syntéza a analýza různých praktických i teoretických informací poskytují základ pro hodnocení a formulaci četných faktorů ovlivňujících vývoj sportovní gymnastiky.

Cílem článku je pokus o charakterizování vývoje moderní sportovní gymnastiky. Následující závěry vyplývají z teoretické analýzy literatury posledních několika let, z analýzy tréninkového procesu ukrajinských a ruských gymnastů, z vlastních zkušeností získaných ve funkci trenéra i soutěžícího a z dlouhodobého výzkumu předních polských gymnastů. Hlavními vývojovými tendencemi jsou individuální přístup k tréninkovému procesu, intenzifikace tréninku, rychlejší zvládnání sportovních programů vzhledem k neustálému vývoji metodiky, důležitost tělesné přípravy sportovců, sjednocování tréninkového procesu gymnastů vrcholové úrovně, zlepšování prostředků zajišťujících bezpečnější tréninkovou práci a vědecký výzkum hlavních součástí tréninkové přípravy.

Klíčová slova: sportovní gymnastika, vývojové tendence, faktory.

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Scientific orientation

Main areas of the scientific interests concern the determination of the influence of the intensified sports activity on physical and motor development among the gymnasts of varied age who practise sports gymnastics.

The research assumptions aim at determining the ways of optimisation of the control and methodology of the training process with respect to determination of practical direction of programming and planning of the training process.

In order to obtain the intended tasks, the systematic, multistage and multidirectional researches are conducted among the gymnasts at varied stages of sports and physical development.

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THE EFFECTS OF RECREATIONAL ACTIVITIES WITH VOLLEYBALL AND SWIMMING CONTENTS ON THE ANTHROPOMETRIC CHARACTERISTICS AND FUNCTIONAL ABILITIES OF STUDENTS

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The basic aim of this experimental research was to study the effectiveness of recreational programs with volleyball and swimming contents. It was carried out on a sample of 368 male students of the University of Niš, which were divided into 3 sub-samples; 115 subjects were part of an experimental group which trained volleyball contents, 126 made up the experimental group which trained swimming contents and 127 were part of the control group.

By using two different programs of recreational exercise in the training of the experimental groups, an increase in their functional abilities occurred, especially in the case of the experimental group which trained using recreational contents from volleyball. A more significant increase in maximal anaerobic ability and relative and absolute maximal oxygen uptake was determined for the experimental group which trained using contents from volleyball; therefore, the use of this type of exercise in the training aimed at their development is justified. In the case of the other experimental group, a significant increase in vital lung capacity was noted.

When it comes to circular measurements of the body and fatty tissue, a difference was noted in the decrease of fatty tissue and body weight for the experimental group in relation to the control one, and a simultaneous increase in circular measurements, which is the consequence of an increase in muscle tissue at the expense of fatty tissue. For the control group, an increase in circular measurements was noted, at the expense of fatty tissue.

Keywords: Recreational programs, experiment, functional abilities, anthropometric measurements, male students.

INTRODUCTION

Today, under the conditions of modern living and work, static work loads dominate, along with a very small engagement of the locomotor apparatus, which is why negative influences on the human body occur. The human body represents a uniquely organized whole, comprised of a row of dimensions of the psychosomatic status. That both the positive and negative changes to these dimensions are influenced by a large number of factors has been proven by Radovanović (1981) and Mikić (1991). Numerous analyses and much research show that people have really become addicted to the modern way of life and that they participate in physical activities to a very small extent, even less than is their natural need, which inevitably leads to "modern age" disease, as the consequence of an inadequate level of functional abilities.

The experience gained by working with the student population imposes a solution in the direction of a compensation for the negative influences of the modern way of life, by using well organized and expertly programmed physical activities. All the mentioned activities should

be an everyday necessity due to the adaptation of the body to new living conditions, the influence on one's health status (James, 1982; Simić et al., 1984; Ivković-Lazar, 1992), bringing abilities for work to a higher level or even for the purpose of an active holiday and the entertainment of younger generations. Daily walking and running over a period of 8-10 weeks can increase cardiovascular abilities by 20-25% (Balke, 1972).

Recreational exercise requires regular use of the model, adequate dosing of activity and regular monitoring and checking of the exercise effects. If children and students get used to everyday physical exercise and if it becomes a necessary element of their life regime and lifestyle, they could continue with it until late in life (Aleksandrov, 1978; Aslan, 1988).

Practice and the results obtained by working with the student population (Živković, 2005) indicate that various physical activities in their extent and content, cannot have an effect in regards to overall development, unless they are implemented over adequate and correct time spans. The reasons, which have so far been cited, along with the fact that physical education classes are, for the time being, not performed in an organized manner as

part of the curriculums of the Universities of Serbia, must inevitably lead to a stagnation of anthropological dimensions among the student population, considering the fact that a break occurs in systematic exercise after the completion of high school, a fact that was indicated by Nikolić (2003). In order to prevent the inadequate development of anthropological dimensions among the student population, a fact that many authors have indicted in the past (Đurašković, Mihajlović, & Nikolić, 1984; Radovanović & Božić, 1990; Mitić, 1990; Ilić, 1991), it is necessary to organize programmed recreational exercise (Blagajac, 1987), in order to directly affect the effectiveness of the transformation process. It has been proven in practice that each student has special characteristics and development dynamics.

Planned and programmed recreational exercise, apart from affecting the development and stabilization of anthropological dimensions, as proven by a number of authors (Bjorntorp, 1974; Todorovski, 1979; Mokeev et al., 1994; Štrbac, 1997; Nikolić, 2003) and being a preventive and corrective function, is part of the easier and more adequate completion of the obligations that students have within their study regime, which in the overall context means a preparation for the challenges which their future vocation, for the purpose of survival in modern society, places before them.

The problem of our research was to check the effects of various recreational activity programs (volleyball and swimming) on the morphological characteristics and functional abilities of students. The subject matter of our research were the morphological characteristics and functional abilities and their adaptation to work loads which are caused by the contents of these programs.

The basic aim of this experimental research was to examine the effectiveness of recreational programs with volleyball and swimming contents.

In regards to the set goals, the basic supposition was that the experimental groups, which as part of their exercise use recreational program contents, would achieve a significant decrease in measurements of circular dimensionality and fatty tissue in comparison to the control group which did not exercise. Another hypothesis was that the experimental group could achieve a statistically significant increase in functional abilities in relation to the control group.

METHOD

The sample of subjects

The population from which the sample was extracted for the purposes of this research is defined as a male student population, whose subjects are aged from 19 to 26, are clinically healthy and without any bodily aberrations. One of the more important criteria for choosing

the sample was that the students, during the course of the 2001/2002 school year, attend classes on a regular basis, along with voluntarily choosing to participate in the experimental group for Volleyball (E1), the experimental group for Swimming (E2) or the control group (KO).

The first experimental group (E1) was made up of students of the University of Niš, who of their own free will chose that they would, in the form of a recreational activity, only play volleyball according to a previously determined plan and program, three times a week at regular intervals. The subjects from this group were divided into three sub-groups and each numbered 35 students, so 115 students actively participated in these classes.

The members of the other experimental group (E2) were students who of their own accord decided that they would, in the form of a recreational activity, only swim according to a previously determined plan and program, three times a week at regular intervals. This group was divided into four sub-groups, each consisting of 30–35 students, so 126 students actively participated in these classes.

The control group was formed using 127 students of the University of Niš. The subjects of this group (KO) did not have regular or organized recreational physical activities, so the overall data that was included in the study consisted of only what was obtained from those students who were measured and tested at the beginning and end of the experiment, over regular intervals. For practical reasons most of the students from this group were students of the Faculty of Medicine.

The sample of variables

The research included those variables that best represent manifest and latent dimensions, and at the same time have metric characteristics which were determined in earlier research (correctness, reliability and objectivity).

All the measurements of anthropological variables were carried out by means of the International Biological Program (IBP) (Weiner & Lourie, 1969).

The research encompassed nine measurements of the morphological area which cover a three-dimensional hypothetical area, and the measurements for the evaluation of a rectilinear dimensionality were left out. This choice was motivated by the character of the research, including: body mass (ABDMS), average thorax volume (ATHVL), abdominal volume (ADVL), extended forearm volume (AFAVL), thigh volume (ATHVL), skin creases of the forearm triceps (ASCFT), back skin creases (ABCSC), abdominal skin creases (AADSC) and thigh skin creases (ATHSC).

In order to define the functional area, five tests were conducted, including: vital lung capacity (FVLCP), resting heart rate frequency (FRHRF), absolute maximal

uptake of O₂ (FAMOU), relative maximal uptake of O₂ (FRMOU) and a test for maximal anaerobic abilities according to Astrand (FMAAA).

In choosing the variables, the experience gathered from the research conducted so far on the student population was used, and what was also taken into consideration was the fact that the choice had to include the necessary metric characteristics (correctness, reliability and objectivity).

A description of the research

The experimental programs consisted of the realization of technical/tactical elements of volleyball and swimming by means of the interval method, and which were realized starting from 1. 10. 2001 with the start of the new school year at the University of Niš and lasted continuously until 15. 1. 2002, or to be more precise, for one semester or 45 classes (the duration of one class was 60 minutes). This period of time was judged to be the most suitable for the functioning of the changes to the studied values in a qualitative sense, considering the summer holidays and the initial state of the subjects' abilities.

At the beginning of the experimental program, an initial as well as a final measurement as part of all the tests used in the research was conducted, with the aim of determining the variability of the results from the initial and final states in the morphological development and the functional abilities of the students of the control and experimental groups.

With the purpose of a better adaptability of physiological functions and their being taken to a higher level, at certain points during the experiment the values and dynamics of heart rate when the subject is in motion and the frequency of breathing were checked. Registering the changes that took place in the course of the work had a direct impact on the further progressive increase of the intensity of the activities.

Methods of data analysis

In order to efficiently solve the problem of the effect of the experimental program on the somatic status of the subjects, it was necessary to determine whether there were any differences among the subjects of the experimental and control groups at the initial measuring, or whether while choosing the sample of subjects, a homogenizing of the groups occurred before the onset of the experimental treatment.

In order to determine the differences between the subjects of the experimental and control groups in regards to somatic status at the multivariate level, the multivariate analysis of the variance was used (MANOVA), and in order to obtain the data regarding in which of the

variables differences do occur, the univariate analysis of the variance was used (ANOVA).

After we had determined that there were differences at the initial state among the groups, it was necessary to determine the extent of the progress that each of the groups had made in the studied areas, during the period between the initial and final measuring. For that purpose, at the multivariate level, the multivariate analysis of the variance was used (MANOVA - repeated measures), while at the univariate level, the univariate analysis of the variance was used (ANOVA - repeated measures).

On the basis of the determined inter-group differences at the initial measuring among the experimental and control groups in the anthropometric and functional space, with the aim of determining the effectiveness of the applied experimental programs, an analysis of any possible inter-group differences at the final measuring in the studied areas was conducted, by means of the multivariate analysis of the covariance (MANCOVA), while the individual univariate differences among the groups in regards to certain variables were determined at the univariate level by means of the univariate analysis of the covariance (ANCOVA). In fact, by means of this analysis the noted differences at the initial measurements among the groups was neutralized, and the determination of the differences was done via partialized adjusted middle values at the final measurement.

Legend

Wilks' Lambda - value of Wilks' Lambda test;

Rao's R - value of Rao's test;

df1, df2 - degree of freedom;

Q - statistical pregnancy?, significance? of the value of Rao's test;

Mean - arithmetical middle value;

Std. dev. - standard deviation of the mean;

Var. - variable;

Adj. mean - adjusted mean;

F - value of the F-test;

p - statistical pregnancy?, significance? of the F-test.

THE RESULTS AND THE DISCUSSION

By inspecting TABLE 1-4 of the multivariate and the univariate analysis of the variance of the applied anthropometric measures and functional tests among the subjects of the experimental and control groups in their initial state, it can be concluded that a statistically significant inter-group difference is present at the .00 level (Q = .000). The noted difference most probably presents itself as the fact that the sample of subjects of the experimental groups is defined as a stratified sample

of subjects with affinities for sport, which most likely on its part draws the distinctions both in the anthropometric and functional structures of the subjects.

TABLE 1

The multivariate analysis of the variance among the subject groups within the anthropometric area at the initial measuring

Wilks' Lambda	Rao's R	df 1	df 2	Q
0.536	14.50	18	714	.000

TABLE 2

The univariate analysis of the variance among the subject groups within the anthropometric area at the initial measuring

Var.	Mean			Mean sqr effect	Mean sqr error	F(2.365)	p
	E1	E2	KO				
ABDMS	76.6	74.7	76.3	33945.1	93.0	1.40	.248
ATHVL	93.8	93.3	89.2	13590.7	37.2	21.45	.000
ADVL	78.9	79.6	79.1	15834.7	43.4	0.36	.697
AFAVL	28.0	28.2	27.8	2972.6	8.1	0.68	.506
ATHVL	55.0	54.6	53.3	7831.8	21.5	4.66	.010
ASCFT	10.2	10.0	14.4	8777.8	24.0	32.55	.000
ABCSC	10.7	11.6	12.9	7602.6	20.8	7.32	.001
AADSC	13.8	14.7	14.6	18479.3	50.6	0.61	.544
ATHSC	14.7	13.7	16.7	11860.6	32.5	9.19	.000

TABLE 3

The multivariate analysis of the variance among the subject groups within the functional area at the initial measuring

Wilks' Lambda	Rao's R	df 1	df 2	Q
0.840	6.57	10	722	.000

TABLE 4

The univariate analysis of the variance among the subject groups within the functional area at the initial measuring

Var.	Mean			Mean sqr effect	Mean sqr error	F(2.365)	p
	E1	E2	KO				
FVLCP	4476.52	4318.25	4748.82	139051947	380964.2	15.74	.000
FRHRF	79.51	81.83	82.96	22780	62.4	5.91	.003
FAMOU	3.13	3.09	2.92	167	0.5	3.43	.034
FRMOU	40.71	41.15	37.99	18315	50.2	7.32	.001
FMAAA	43.51	42.74	43.43	20038	54.9	0.41	.666

The results of the analyses of the differences between the initial and final measuring (TABLE 5-16) indicate that in the case of the experimental groups, a significant increase in all the functional abilities occurred, with the exception of the maximal anaerobic ability (FMAAA) of the swimmers, where no significant improvement was noted. In the case of the control group, the improvement in the results is evident in the case of absolute maximal oxygen uptake - FAMOU, and a decrease was noted in

the resting heart rate frequency - FRHRF and in the maximal anaerobic ability - FMAAA.

In the anthropometric area the decrease in body weight and fatty tissue located under the skin is evident, along with an increase in the circular measurements of swimmers (with the exception of the abdominal volume, which decreased) at the expense of the muscle tissue, while for the control group an increase in circular measurements was noted, but at the expense of an increase in fatty tissue under the skin.

TABLE 5

The multivariate analysis of the variance (repeated measures) between the initial and final measurements in the anthropometric area of the E1 group

Wilks' Lambda	Rao's R	df 1	df 2	Q
.149	67.14	9	106	0.00

TABLE 6

The univariate analysis of the variance (repeated measures) between the initial and final measurements in the anthropometric area of the E1 group

Var.	Mean		Mean sqr effect	Mean sqr error	F(1.114)	p
	Initial	Final				
ABDMS	76.61	75.62	57.00	.13	429.66	.000
ATHVL	93.84	93.91	.30	1.44	.21	.649
ADVL	78.86	78.51	6.89	3.89	1.77	.186
AFAVL	27.98	28.10	.90	.76	1.19	.277
ATHVL	55.00	55.02	.03	.46	.06	.800
ASCFT	10.21	9.67	16.28	.23	71.09	.000
ABCSC	10.68	10.20	13.15	.21	64.00	.000
AADSC	13.76	13.51	3.71	2.59	1.43	.234
ATHSC	14.73	14.18	17.15	.43	39.72	.000

TABLE 7

The multivariate analysis of the variance (repeated measures) between the initial and final measurements in the anthropometric area of the E2 group

Wilks' Lambda	Rao's R	df 1	df 2	Q
.122	93.31	9	117	0.00

TABLE 8

The univariate analysis of the variance (repeated measures) between the initial and final measurements in the anthropometric area of the E2 group

Var.	Mean		Mean sqr effect	Mean sqr error	F(1.125)	p
	Initial	Final				
ABDMS	74.71	73.93	38.50	.77	49.68	.000
ATHVL	93.33	93.94	23.16	.21	112.06	.000
ADVL	79.56	78.76	40.32	.91	44.08	.000
AFAVL	28.23	28.71	14.05	.53	26.33	.000
ATHVL	54.59	55.37	37.41	.86	43.56	.000
ASCFT	9.98	9.12	45.94	.35	132.92	.000
ABCSC	11.60	10.47	79.54	.14	558.43	.000
AADSC	14.67	13.63	68.83	.35	199.18	.000
ATHSC	13.66	12.41	98.81	1.08	91.11	.000

TABLE 9

The multivariate analysis of the variance (repeated measures) between the initial and final measurements in the anthropometric area of the KO group

Wilks' Lambda	Rao's R	df 1	df 2	Q
.777	3.72	9	118	.000

TABLE 10

The univariate analysis of the variance (repeated measures) between the initial and final measurements in the anthropometric area of the KO group

Var.	Mean		Mean sqr effect	Mean sqr error	F(1,125)	p
	Initial	Final				
ABDMS	76.24	77.22	60.52	25.68	2.36	.127
ATHVL	89.16	90.00	44.17	9.13	4.84	.030
ADVL	79.06	80.06	63.00	16.00	3.94	.049
AFAVL	27.78	28.56	38.89	2.32	16.79	.000
ATHVL	53.25	54.43	88.10	7.92	11.12	.001
ASCFT	14.44	15.38	55.70	16.25	3.43	.066
ABCSC	12.87	13.20	7.07	8.75	.81	.371
AADSC	14.60	15.02	11.40	15.22	.75	.388
ATHSC	16.70	17.83	80.02	16.98	4.71	.032

TABLE 11

The multivariate analysis of the variance (repeated measures) between the initial and final measurements in the functional area of the E1 group

Wilks' Lambda	Rao's R	df 1	df 2	Q
.153	121.81	5	110	0.00

TABLE 12

The univariate analysis of the variance (repeated measures) between the initial and final measurements in the functional area of the E1 group

Var.	Mean		Mean sqr effect	Mean sqr error	F(1,114)	p
	Initial	Final				
FVLCF	4476.52	4623.48	1241783.0	2484.4	499.84	.000
FRHRF	79.51	77.30	280.5	3.3	84.71	.000
FAMOU	3.13	3.27	1.2	.0	37.18	.000
FRMOU	40.71	43.06	316.5	5.0	63.20	.000
FMAAA	43.51	45.92	335.4	4.9	68.70	.000

TABLE 13

The multivariate analysis of the variance (repeated measures) between the initial and final measurements in the functional area of the E2 group

Wilks' Lambda	Rao's R	df 1	df 2	Q
.142	146.01	5	121	0.00

TABLE 14

The univariate analysis of the variance (repeated measures) between the initial and final measurements in the functional area of the E2 group

Var.	Mean		Mean sqr effect	Mean sqr error	F(1,125)	p
	Initial	Final				
FVLCF	4318.25	4526.98	2744802.0	4241.6	647.12	.000
FRHRF	81.83	79.87	240.1	5.4	44.28	.000
FAMOU	3.09	3.18	.5	.0	41.15	.000
FRMOU	41.15	43.00	216.3	2.5	88.22	.000
FMAAA	42.74	42.95	2.8	3.6	.77	.381

TABLE 15

The multivariate analysis of the variance (repeated measures) between the initial and final measurements in the functional area of the KO group

Wilks' Lambda	Rao's R	df 1	df 2	Q
.749	8.17	5	122	.000

TABLE 16

The univariate analysis of the variance (repeated measures) between the initial and final measurements in the functional area of the KO group

Var.	Mean		Mean sqr effect	Mean sqr error	F(1.126)	p
	Initial	Final				
FVLCP	4748.82	4745.67	629.9	76661.7	.01	.928
FRHRF	82.96	84.35	122.0	8.9	13.65	.000
FAMOU	2.92	2.96	.1	.0	4.40	.038
FRMOU	37.99	37.89	.7	5.1	.14	.711
FMAAA	43.43	42.29	83.1	11.5	7.23	.008

By inspecting TABLE 17, where the multivariate covariance analysis of the applied anthropometric variables among the subjects of the experimental and control groups at the final measuring with the partialization and neutralization of the noted differences at the initial measuring is shown, it can be concluded that a statistically significant inter-group difference exists at

the .00 level ($Q = .000$). The noted difference occurs under the influence of the applied experimental factors, by means of which a conclusion can be drawn that the applied experimental programs of recreational physical activities had a positive effect on the transformation of the anthropometric characteristics of the subjects of the experimental groups.

TABLE 17

The multivariate analysis of the covariance among the subject groups within the anthropometric area at the final measuring

Wilks' Lambda	Rao's R	df 1	df 2	Q
.768	5.46	18	696	.000

TABLE 18 shows the univariate differences of certain anthropometric tests among the experimental and control groups at the final state with the neutralization and partialization of the differences in anthropometric area at the initial measuring, where a significant inter-group difference in all the variables at the .05 level ($p < .05$) is evident, with the exception of the variable for the middle thorax volume (AMTHVL) and thigh volume (ATHVL). Body mass, abdominal volume and the fatty tissue under the skin were significantly reduced among the swimmers and volleyball players in comparison with the members of the control group, who regis-

tered an increase in body mass and fatty tissue during the experimental period.

From the obtained results the conclusion can be drawn that the experimental programs of the E1 and E2 groups gave good results when it comes to changes in anthropometric measurements, and especially when it comes to reducing fatty tissue under the skin and reducing body weight. What is also noticeable is the decrease in the circular dimensionality in the case of both of the experimental groups in relation to the control one, as a consequence of the decrease in fatty tissue under the skin, or the increase of the same among the members of the control group.

TABLE 18

The univariate covariance analysis among the subject groups in the anthropometric area at the final measuring

Var.	Adj. mean			Mean sqr effect	Mean sqr error	F(2.356)	p
	E1	E2	KO				
ABDMS	74.82	74.98	77.09	116.64	17.09	6.83	.001
ATHVL	92.16	92.71	93.02	16.18	6.92	2.34	.098
ADVL	78.69	78.53	80.15	58.82	11.54	5.10	.007
AFAVL	28.04	28.51	28.86	14.08	2.25	6.25	.002
ATHVL	54.46	55.11	55.27	16.85	5.60	3.01	.051
ASCFT	10.59	10.25	13.31	206.21	10.14	20.33	.000
ABCSC	10.83	10.39	12.70	112.67	5.20	21.66	.000
AADSC	13.85	13.11	15.22	89.88	11.17	8.05	.000
ATHSC	14.44	13.40	16.56	201.23	11.04	18.22	.000

By inspecting TABLE 19, where the multivariate covariance analysis of the applied functional tests among the subjects of the experimental and control groups at the final measuring with the partialization and neutralization of the noted differences at the initial measuring is shown, it can be concluded that a statistically significant inter-group difference exists at the .00 level ($Q = .000$).

The noted difference occurs under the influence of the applied experimental factors, according to which a conclusion can be drawn that the applied experimental programs of recreational physical activities had a positive affect on the transformation of the functional abilities of the subjects of the experimental groups.

TABLE 19

The multivariate covariance analysis among the subject groups in the functional area at the final measuring

Wilks' Lambda	Rao's R	df 1	df 2	Q
.517	27.81	10	712	.000

TABLE 20 shows the univariate differences of certain functional tests among the experimental and control groups at the final state with the neutralization and partialization of the differences in the functional area at the initial measuring, where a significant inter-group difference in all the tests at the .05 level ($p < .05$) is

evident. The volleyball players had the best results for the resting heart rate frequency - FRHRF, absolute maximal oxygen uptake - FAMOU, relative maximal oxygen uptake - FRMOU and maximal anaerobic ability - FMAAA, while the swimmers achieved the best results for the increase in vital lung capacity - FVLCP.

TABLE 20

The univariate covariance analysis among the subject groups in the functional area at the final measuring

Var.	Adj. mean			Mean sqr effect	Mean sqr error	F(2.360)	p
	E1	E2	KO				
FVLCP	4649.20	4702.66	4544.28	707892.1	53465.6	13.24	.000
FRHRF	78.84	79.50	83.18	587.7	9.6	61.15	.000
FAMOU	3.20	3.15	3.07	.4	.0	9.92	.000
FRMOU	42.40	42.02	39.53	261.1	7.2	36.45	.000
FMAAA	45.57	43.48	42.11	335.7	11.8	28.53	.000

In the discussion of the statistical analysis, what is emphasized is the fact that by using various programs of recreational exercise within the experimental group, an increase in functional abilities occurred, especially in the case of the experimental group which trained using recreational contents from volleyball. A more significant increase in the maximal anaerobic and relative and absolute maximal oxygen uptake was determined for the

experimental group which used volleyball contents in its training, and it was therefore justified that this type of exercise be used in the training for the development of these abilities. The E1 experimental group reached an increase in absolute maximal oxygen uptake from 3.13 and 3.27. The resting heart rate frequency (average value) for the students of the E1 experimental group was 77.3 beats per minute. These values are somewhat

greater in comparison to the average values of athletes (soccer players and handball players), and somewhat smaller in comparison to the values of men who do not participate in sport activities (Đurašković, 2002). This can be explained by the fact that the subjects were not, during the course of their exercise, burdened with the limits of submaximal and maximal work loads, which would lead to the prevailing influence of the parasympathetic nerves (n. vagus) over the sympathetic ones. In addition, it is well known that the programmed and correctly distributed physical activity leads to bradycardia (Đurđević, 1981), and this fact can be used to explain the lower heart rate frequency of our subjects in relation to men who do not actively participate in physical activities. Similar results were obtained in the research conducted by Đurđević (1981), Đurašković (2002) and Živanić (2004). The swimming program had a significant effect on the vital lung capacity. It was manifested in a value from 4318 ml at the initial up to 4527 ml at the final measuring.

When it comes to the circular measurements of the body and fatty tissue, the difference in the reduced amount of the fatty tissue and body weight can clearly be seen in the experimental groups in relation to the control one, and at the same time an increase in circular measurements, which can be explained by an increase in muscle mass at the expense of fatty tissue. In the case of the control group, an increase in is evident, but with an increase in fatty tissue.

CONCLUSION

On the basis of the analysis of the results obtained during the course of this research, it can be concluded that the experimental programs of recreational physical activities with contents from volleyball and swimming did make a significant contribution to the decrease in body weight and fatty tissue under the skin. The program of recreational physical activities with contents from volleyball gave the best results for the improvement of the maximal anaerobic abilities and maximal absolute and relative oxygen uptake, not to mention that it decreased the resting heart rate frequency, while the program of physical activities with swimming contents gave the best results for the increase of vital lung capacity.

On the basis of these research results it could generally be concluded that the applied experimental programs in volleyball and swimming had positive effects on the improvement of the anthropometric characteristics and functional abilities of the male student population.

The application of regular forms found in recreational activities is mostly of significance for the preservation of good health and the improvement of the functions of the respiratory and cardiovascular systems. This kind

of research could have multiple scientific and practical implications:

- the research results could relatively easily be applied in practice, as they give an insight into the verified programs of regular recreational activities;
- the results of this research could also have a positive affect on the motivation of the subjects for a systematic completion of recreational activities, considering the fact that hypokinesia is to a great extent present in people this age;
- the direct results and the applied programs of recreational activities enable a scientific validation of the set of variables by means of which it is possible to later track the effects of the programmed recreational activities on the somatic status of the subjects;
- the obtained research results enable the scientifically verified programs of recreational activities to receive more frequent application, to spread in everyday use and among people of various age groups;
- the direct results of the effects of recreational activities on the change in the status of the anthropometric and functional areas could be applied in the building of a system of programmed recreational activities and the methodological tracking of these effects on the overall anthropological status of the subjects from the student population.

Naturally, many questions are left open and in need of an answer. One of these questions is how to determine which exercises have significantly contributed to the determined differences among the experimental and control groups. The second question refers to the part played by the other leisure activities of the subjects, which to a great extent can influence the positive or negative reactions of the body, and which were not under our control. What remains is for upcoming similar research to follow a larger number of measuring instruments and keep under control as many factors which influence the changes in the studied dimensions as possible.

Finally, the fact that this research and other research similar to it will open other questions must not be excluded. These might be questions to which we cannot give a proper answer at this point, but which, in any case will be a motivation for further expert and scientific verification of such research.

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**ÚČINKY REKREAČNÍCH AKTIVIT
S VOLEJBALOVOU A PLAVECKOU NÁPLNÍ
NA ANTROPOMETRICKÉ CHARAKTERISTIKY
A FUNKČNÍ SCHOPNOSTI STUDENTŮ**

(Souhrn anglického textu)

Základním cílem tohoto experimentálního výzkumu bylo zkoumat účinnost rekreačních programů s volejbalovou a plaveckou náplní. Byl prováděn na vzorku 368 studentů mužského pohlaví z Univerzity v Niš, kteří byli rozděleni do 3 podskupin. 115 účastníků bylo přiřazeno do experimentální skupiny, která se věnovala volejbalu, 126 tvořilo experimentální skupinu, která se věnovala plavání a 127 představovalo kontrolní skupinu.

Při použití dvou různých programů rekreačního cvičení došlo v průběhu tréninku experimentálních skupin ke zvýšení funkčních schopností, zvláště v případě experimentální skupiny, která se věnovala rekreační volejbalové náplni. U experimentální skupiny, která se věnovala volejbalu, byl stanoven významnější nárůst maximální anaerobní schopnosti a relativního i absolutního maximálního příjmu kyslíku. Využití tohoto typu cvičení při tréninku zaměřeném na jejich vývoj se proto jeví jako opodstatněné. V případě zbývajících dvou experimentálních skupin byl pozorován významný nárůst vitální kapacity plic.

Pokud jde o obvodová měření těla a tukové tkáně, byl u experimentální skupiny vůči kontrolní skupině zaznamenán rozdíl ve snížení tukové tkáně a tělesné hmotnosti a zároveň nárůst hodnot při obvodovém měření, což byl důsledek nárůstu svalové tkáně na úkor tkáně tukové. U kontrolní skupiny byl při obvodovém měření zaznamenán nárůst hodnot, a to na úkor tukové tkáně.

Klíčová slova: rekreační programy, experiment, funkční schopnosti, antropometrická měření, studenti mužského pohlaví.

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THE SECULAR TREND IN THE SOMATIC DEVELOPMENT AND MOTORIC PERFORMANCE OF BOYS IN THE OLOMOUC REGION WITHIN THE LAST 36 YEARS

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In his study, the author analyses the changes in somatic development and motoric performance of boys from 7 to 15 years of age in the Olomouc region within the last 36 years. The author found a positive functioning of the secular trend regarding body height. The present probands have significantly higher height but almost the same weight as the boys of the same age examined 36 years ago. In the monitoring of changes in motoric performance, the author found that the present probands achieve the same results in 50 m runs, in the standing long jump with legs together, in throwing the medicine ball and in pull-ups as the boys examined 36 years ago. In conclusion, the author states that there is no improvement in the development of motoric abilities, on the contrary there is a stagnation of the development of the speed and strength abilities of boys from 7 to 15 years of age in the Olomouc region.

Keywords: Secular trend, boys 7 to 15 years of age, motoric abilities, motoric tests, motoric performance.

INTRODUCTION

The secular trend of somatic parameters has been monitored within the post-war program of regular anthropological measurements of our population starting in 1951 and the development trends of the population have been well mapped. The secular trend in the motoric performance of the non-sporting population has not been monitored as regularly as in the above mentioned anthropological research.

The first statewide representative measurement of the motoric performance of the common population was of children and youth aged 7 to 19 years and was carried out in 1966 by Pávek (1968), another research project was carried out in the years from 1968 through 1974 within the International biological program of the population aged 12 to 55 years by Seliger (1977), and in 1972, another measurement of the somatic parameters and motoric performance of the members of ČSTV (Czech Union of Sports and Physical Training) was carried out by Čelikovský (Čelikovský et al., 1973). The last representative measurement of our population was carried out by Moravec in 1987 (Moravec et al., 1990).

Although in somatic parameters we could observe a positive secular trend, in motoric performance the positive secular trend cannot be unambiguously confirmed (Čelikovský et al., 1985; Moravec et al., 1990). Moravec et al. (1990) compared the motoric performance of the population aged 7 to 18 years as measured in 1987 with results obtained by Pávek (1968) in 1966. Following

the finding of these results, he came to the conclusion that boys showed lower performance in all monitored motoric tests and girls have lower performance in the endurance run in comparison with the population evaluated by Pávek (1968) in 1966.

In the Olomouc region, somatic and motoric developments have been reviewed by many authors. The first study of somatic development and motoric performance was probably carried out in 1968 by Kubánek (1971). He monitored motoric performance and somatic development in primary school pupils of grades 6 to 9 and compared the results found with the study carried out by Pávek (1968). The relationships between parameters of somatic development and motoric tests in 12 year old boys in Olomouc were examined by Drlík (1970). The dependence of motoric development on physical conditions was examined by Drlík and Vaverka (1970). They used the electric dynamometer for testing strength in static action in a set of 86 untrained boys aged 12 years old. They analyzed the mutual interaction of the linear dimensions of upper limbs and active body mass in relationship to the strength of flexion and extension in the elbow. Riegerová (1984) in her semi-longitudinal study evaluated the development of children in relationship to intensive physical activities using the method of biological proportional age. She observed sets of boys and girls with a standard body height at Olomouc primary schools in sports classes specializing in ice-hockey and swimming. The efficiency of the physical training process in grammar schools was studied by Frömel (1987) in the period 1981–1983. He found out that the motoric

performance of boys improved within a period of two years. In comparison with the performance of twenty years ago he found out that motoric performance has improved only in girls. The highest deficiencies were found in the development of the endurance of boys and girls. Procházka (1990) studied the changes of somatotype in a set of 346 boys of 11 to 13 years of age within a semi-longitudinal anthropological study in the period 1987–1988. He observed and compared the changes of somatotype of boys in special sports classes (swimming, track athletics, volleyball, ice-hockey and football) and boys in classes with standard physical training lessons.

Monitoring of the physical loading of primary school pupils in lessons of physical training was carried out by Mazal and Spilka (1987). They monitored the heart rate of pupils using the tactile board and the BIOCARD reader. The main objective of the study was to monitor the heart rate values of pupils during their sporting activities in physical training classes.

Frömel, Novosad and Svozil (1999) studied the sports activities of children and youth on a long-term basis. They found out that the total amount of sports activities within a day's or week's schedule is declining and their interest in organized sports activities in their leisure time is also decreasing. This study also confirmed that both boys and girls have a noticeably negative attitude towards the development of endurance abilities.

Kopecký, Bezděková and Hřivnová (2002) examined somatic parameters and the level of motoric performance in children of 12 years of age. The measured values were compared with referential values of the International biological programme from 1968–1974 (Seliger, 1977). They found a positive influence of the secular trend in somatic parameters and a stagnancy in motoric performance. Similar results were found by Kopecký (2004) when comparing the motoric performance of boys who were tested in 2002 with the referential data from 1987 (Moravec, 1990).

The submitted study aims to add some new information on somatic and motoric development of boys of the Olomouc region of 7 to 15 years of age within the past 36 years.

OBJECTIVE OF THE STUDY

The objective of the study is to evaluate secular changes in somatic parameters and motoric performance in boys of 7 to 15 years of age measured in the period 2001–2002, in comparison with the first statewide research project on the physical performance of youth carried out by Pávek (1968) in 1966 and the study carried out by Kubánek (1971) in the Olomouc region.

METHODS

The study set includes 615 boys of 7 to 15 years of age. The research was carried out in 7 primary schools of both rural and urban type in the Olomouc region in the period 2001–2002. None of these schools specialized in sports. The chronological age of probands was set as to the date of the measurements in tenths of years following the principles of IBP (Weinier & Lourie, 1969). Probands were divided into particular age categories according to their chronological age within the span of ± 0.5 year (e. g. 10 years old = 9.51–10.50 years of age). The body height and weight were measured in accordance with the standard anthropometrical methodology, as stated by Riegerová and Ulbrichová (1998). The referential values of Pávek (1968), (hereinafter boys CR 1966), and Kubánek (1971), (hereinafter boys OL 1968), are compared with the examined set of Olomouc boys (hereinafter boys OL 2002) in the following somatic parameters: body height, body weight and in motoric parameters: 50 m run, standing long jump with legs together, throwing of the medicine ball using both hands, and pull-ups. The choice of motoric tests enabled the researchers to particularly observe the dynamic strength of the large muscle groups and speed abilities (Měkota & Blahuš, 1983).

For numeric processing of the observed data, we used mathematical statistical methods (Hendl, 2004) and STATISTICA.CZ programme package, release 6. For statistical evaluation, the one choice Student T-test was used to compare our sets with the population constants found in referential sets of statewide research projects on the physical performance of youth carried out in 1966 (Pávek, 1968) and with the results of the study of the motoric performance of pupils in the Olomouc region in 1968 presented by Kubánek (1971). The referential values adopted from Pávek (1968) from 1966, were obtained by measurements of somatic parameters and the motoric performance of primary school pupils of 7 to 15 years of age in Czech urban regions. The somatic and motoric parameters of pupils in the Olomouc region stated by Kubánek (1971) have values separated for urban and rural probands. Considering the fact that in these sets some age groups of boys were weaker in number ($n < 30$), the weighted averages were counted for each age group and gender following the supposed average values and the number of probands (Hendl, 2004). Tests were carried out on the level of significance (* $p < .05$, ** $p < .01$).

RESULTS AND DISCUSSION

Secular changes in somatic parameters

The differences in somatic development between the compared sets of boys were evaluated following their body height and weight.

Average values and development curves of the body height of boys suggest a declining trend in the age group 7–15 years of age in Pávek's (1968) sets and Olomouc boys (TABLE 1, Fig. 1). The average body height of Olomouc boys suggests a positive secular trend in all age groups in comparison with boys from 1966. Statistically significant variances in average body height were found in the age group of boys of 7, 8 and 13–15 years of age. In comparison with the average body height of boys in the Olomouc region from 1968 (Kubánek, 1971), there

is an obvious height predominance of present-day boys of the age group 12–15. The difference in the observed sets is obvious in the period when the boys reach the peak of their growth speed. In the set of boys from 1966, we found the peak of their growth speed between the 12th and 13th year of age, with the inter-annual increment of 6.45 cm, while in the set of boys from 1968 the maximum increment is 8.65 cm and in the set of present-day boys it is 9.1 cm and this peak of growth speed was achieved coincidentally between the 14th and 15th years of age (TABLE 1). Kubánek (1971) states that the body height of boys in 1968 in comparison with boys from 1966 varies within the framework of statewide standards. Considering the secular trend, the present Olomouc boys have higher body height by 5.57 cm in comparison with boys from 1966 and by 4.61 cm in comparison with boys from 1968 (TABLE 1).

TABLE 1

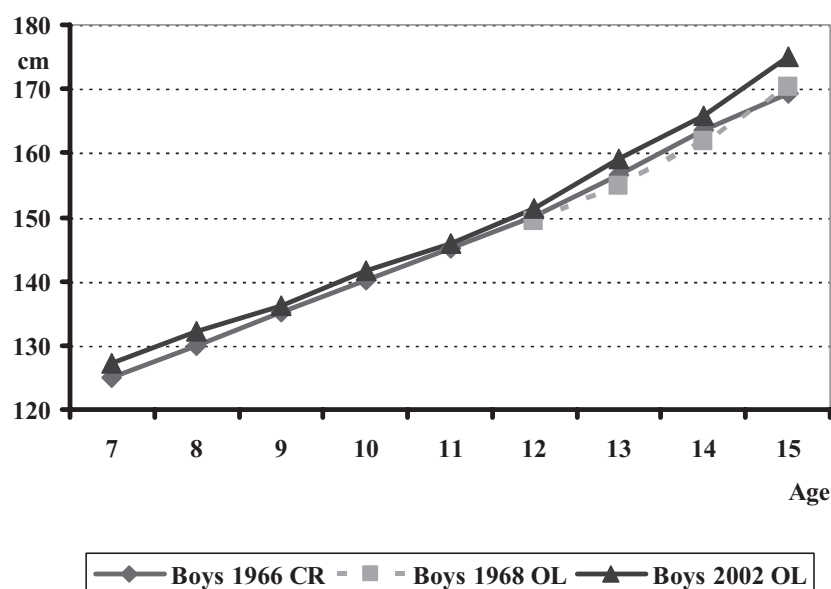
Body height (cm)

Age	Boys 1966 CR			Boys 1968 OL		Boys 2002 OL		
	n	\bar{x}	s	n	\bar{x}	n	\bar{x}	s
7	798	124.92*	5.63	-	-	28	127.26	6.69
8	944	130.02**	5.63	-	-	78	132.18	5.85
9	981	135.20	6.07	-	-	58	136.28	7.31
10	1026	140.27	6.36	-	-	70	141.64	6.25
11	1159	145.24	6.56	-	-	80	145.84	7.27
12	1093	150.04	7.46	87	149.33**	78	151.31	6.58
13	1142	156.49*	8.26	85	154.96**	68	159.06	7.30
14	1186	163.49*	8.75	45	161.71**	71	165.87	8.50
15	1056	169.40**	7.60	88	170.36**	84	174.97	7.95

(*p < .05. **p < .01.)

Fig. 1

Body height (cm)



The body weight of the observed sets of boys does not suggest a noticeable positive secular trend in comparison with body weight (TABLE 2, Fig. 2). The average body weight of present-day boys from the Olomouc region is approximately of the same value as of the boys of the same age from 1966 and 1968 in the age groups of 7–14 years of age. More distinctive variance in the body weight of boys is obvious at 15 years of age. Present-day Olomouc boys had significantly higher weight by 5.12 kg

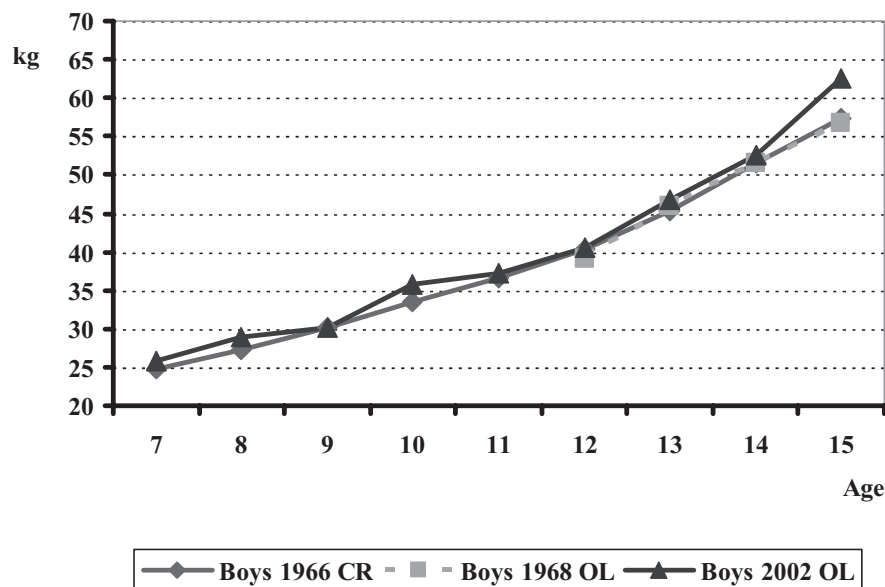
in comparison with boys from 1966 (Pávek, 1968) and by a 5.72 kg higher weight than boys from the Olomouc region from 1968 (Kubánek, 1971). The highest increment in body weight is in boys in 1966 between the 13th and 14th years of age (6.21 kg), in boys from 1968 between the 12th and 13th years of age (6.84 kg), in present-day boys it corresponds with the period of peak growth between the 14th and 15th years of age and it equals 9.96 kg (TABLE 2).

TABLE 2
Body weight (kg)

Age	Boys 1966 CR			Boys 1968 OL		Boys 2002 OL		
	n	\bar{x}	s	n	\bar{x}	n	\bar{x}	s
7	798	24.78	3.54	-	-	28	25.91	6.10
8	944	27.35**	4.27	-	-	78	28.98	6.04
9	981	30.07	4.70	-	-	58	30.16	5.66
10	1026	33.48**	6.03	-	-	70	35.80	8.53
11	1159	36.69	6.62	-	-	80	37.12	9.85
12	1093	40.30	7.41	87	39.07	78	40.63	8.36
13	1142	45.40	8.82	85	45.91	68	46.83	8.06
14	1186	51.61	9.28	45	51.52	71	52.49	9.77
15	1056	57.33**	8.71	88	56.73**	84	62.45	10.17

(*p < .05. **p < .01.)

Fig. 2
Body weight (kg)



Secular changes in motoric performance

The described positive development and growth changes that were found in the present population of children and youth in the past 36 years reflect the genetic disposition of each individual and the environmen-

tal factors (nutrition, health care, family background and peace of mind) that influence growth (Vignerová et al., 2005) as a result of social and economical changes within the stated period. It is obvious that the biological aspect of these changes reflect, besides morphological changes, also changes in the motoric performance of the present generation.

The development of the running speed of the observed sets of boys (TABLE 3, Fig. 3) in the 50 m run test has taken a similar course. It is obvious that the running speed increases with age in boys until 15 years of age. It is surprising that present-day boys have a similar or even lower level of performance in the 50 m run in comparison with referential data from 1966 (Pávek, 1968) and 1968 (Kubánek, 1971).

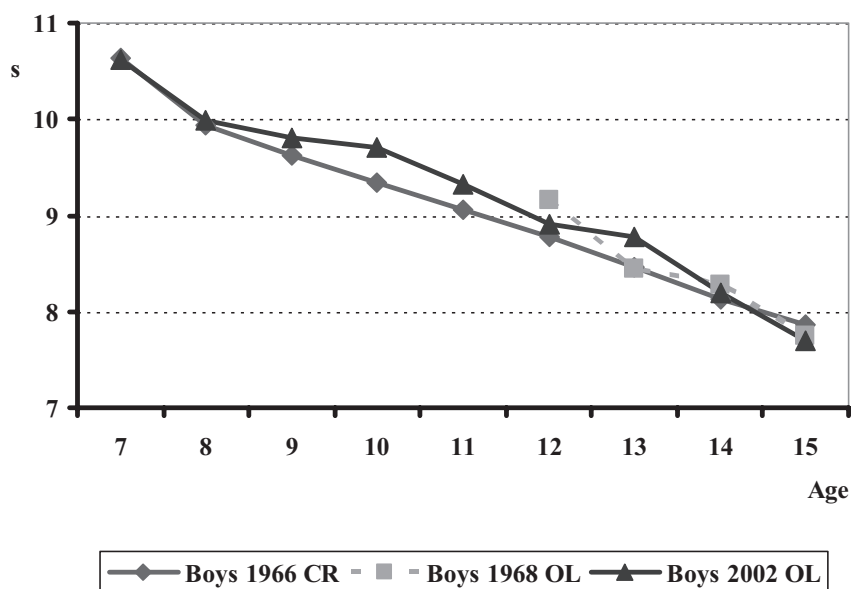
Following the results of measurements of the 50 m run of boys, Kubánek (1971) states that the performance of youth in the Olomouc region corresponds with the standards of youth in Czech regions stated by Pávek (1968). When comparing the results of Pávek (1977), Moravec et al. (1990) came to the conclusion that the boys in 1987 achieved in the 50 m run almost the same results as boys measured in 1966 (Pávek, 1977).

TABLE 3
50 m run (s)

Age	Boys 1966 CR			Boys 1968 OL		Boys 2002 OL		
	n	\bar{x}	s	n	\bar{x}	n	\bar{x}	s
7	754	10.64	1.15	-	-	28	10.61	1.33
8	932	9.94	1.00	-	-	78	9.98	1.24
9	951	9.63	0.84	-	-	58	9.81	0.97
10	998	9.34**	0.78	-	-	70	9.70	0.97
11	1081	9.06**	0.77	-	-	80	9.33	0.89
12	1027	8.77	0.76	87	9.15*	78	8.91	0.91
13	1043	8.46**	0.75	85	8.44**	68	8.77	0.75
14	1065	8.13	0.67	45	8.27	71	8.20	0.70
15	951	7.87*	0.65	88	7.75	84	7.70	0.55

(*p < .05. **p < .01.)

Fig. 3
50 m run (s)



The motoric test of the standing long jump with legs together evaluated the development of the dynamic instant strength of lower limbs of boys and possible changes of this motoric ability since 1966 (Pávek, 1968).

The results of the boys' standing long jump suggest that the performance of boys is unequally increasing from the 7th to the 15th year of age. The average results

of the boys' standing long jump suggest that the highest increments basically correspond with the period of rapid body growth, i.e. between the 12th and 15th years of age (TABLE 4, Fig. 4). When evaluating motoric performance we must take into account the degree of body development. Comparison of motoric performance in present-day boys with the referential data from 1966

(Pávek, 1968) and from 1968 (Kubánek, 1971) does not suggest any improvement in this discipline (TABLE 4, Fig. 4). Development curves of the boys' standing long jump in the observed sets are practically equal. The results of this test confirm that present-day boys achieve practically the same performance as boys from 1966 and 1968 (TABLE 4, Fig. 4) and suggest the boys' dynamic instant strength of their lower limbs is stagnating. The presented conclusions are supported by the fact that the performance of present boys does not exceed the

performance of boys of the same age from 1966 and 1968, although a positive secular trend in body height has been found, which partially influences performance on this motoric test. For completeness, we can mention that in 1968 (Kubánek, 1971) the performance of pupils in the Olomouc region was the same as stated by statewide standards from 1966 (Pávek, 1968). When comparing the populations of children and youth from 1987 with that of 1966, Moravec et al. (1990) found the same results of boys' standing long jump tests.

TABLE 4

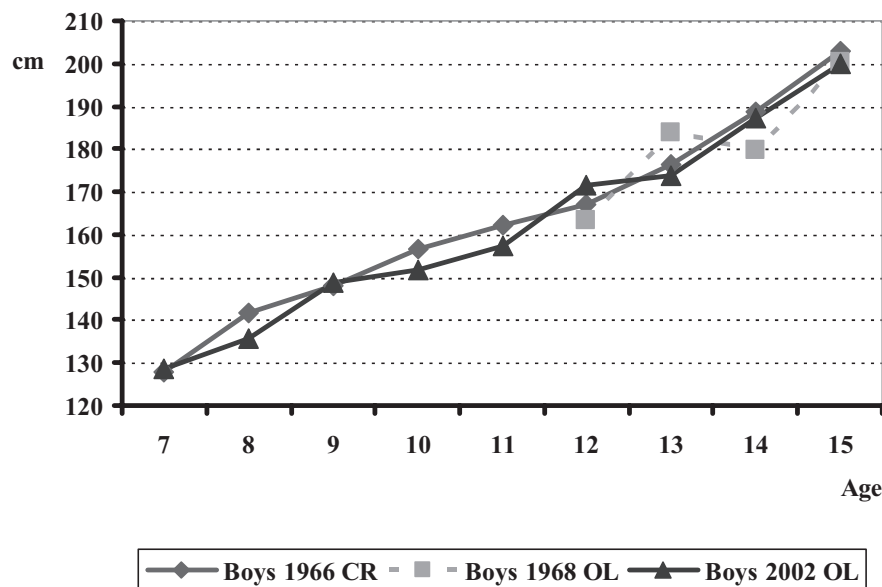
Standing long jump with legs together (cm)

Age	Boys 1966 CR			Boys 1968 OL		Boys 2002 OL		
	n	\bar{x}	s	n	\bar{x}	n	\bar{x}	s
7	784	127.69	26.63	-	-	28	128.50	15.26
8	933	141.53*	23.26	-	-	78	135.55	17.82
9	967	148.18	21.65	-	-	58	148.85	20.61
10	1011	156.65	22.69	-	-	70	151.90	18.95
11	1116	162.23*	20.03	-	-	80	157.18	18.55
12	1079	167.02	22.19	87	163.37**	78	171.41	17.35
13	1130	176.27	21.79	85	183.84**	68	173.74	18.73
14	1159	188.79	25.30	45	179.70**	71	187.21	21.08
15	1040	202.81	23.04	88	200.22	84	199.94	18.41

(*p < .05. **p < .01.)

Fig. 4

Standing long jump with legs together (cm)



A similar developmental secular trend of the motoric performance of present-day boys was found in the throwing the medicine ball test (TABLE 5, Fig. 5). Average values of the medicine ball throw confirm that present boys throw the 2 kg ball to the same distance as the boys of the same age 36 years ago. Development curves suggesting the level of dynamic instant-strength abilities of the upper limbs of observed sets of boys from 1966, 1968 and 2002, are nearly the same. From the stated results, it is obvious that it is not possible to confirm

a positive secular trend of motoric performance in the medicine ball throw test of present boys for the past 36 years. According to Kubánek (1968), pupils in the Olomouc region do not reach the same performance in this discipline as stated by nation-wide performance found in 1966 (Pávek, 1968). On the contrary, Moravec et al. (1990) found a slightly higher results of performance in this discipline in 1987 when comparing them with the statewide standards found in 1966 (Pávek, 1968).

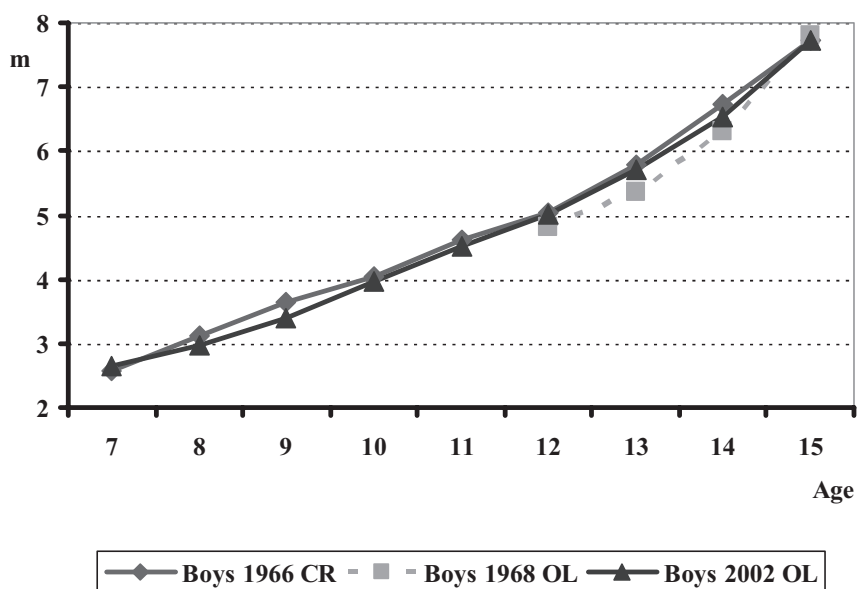
TABLE 5

Throwing medicine ball (m)

Age	Boys 1966 CR			Boys 1968 OL		Boys 2002 OL		
	n	\bar{x}	s	n	\bar{x}	n	\bar{x}	s
7	785	2.58	0.81	-	-	28	2.65	0.63
8	932	3.12	0.62	-	-	78	2.98	0.61
9	966	3.65*	0.75	-	-	58	3.40	0.74
10	1000	4.04	0.81	-	-	70	3.97	0.72
11	1138	4.61	0.87	-	-	80	4.51	0.87
12	1075	5.03	0.91	87	4.82	78	5.02	0.90
13	1125	5.79	1.15	85	5.37*	68	5.70	1.21
14	1159	6.73	1.39	45	6.30	71	6.54	1.27
15	1032	7.73	1.41	88	7.79	84	7.73	1.40

(* $p < .05$. ** $p < .01$.)**Fig. 5**

Throwing medicine ball (m)



The last evaluated motoric performance test consists of pull-ups of boys of 12 to 15 years of age (TABLE 6). The level of dynamic, endurance-strength ability of the upper limbs and shoulder girdle has not changed for the past 36 years. In comparison with the statewide standards from 1966 (Pávek, 1968), we can find a stagnation of this motoric ability. In comparison with boys of the Olomouc region in 1968 (Kubánek, 1971), the found

performance levels are lower. The number of overgrasp pull-ups made on the horizontal bar by the present Olomouc boys of 14 to 15 years of age is lower by one when compared with the boys of the same age in 1968 (Kubánek, 1971).

Moravec et al. (1990) came to a similar conclusion; he found lower performance in the pull-up in 1987 in comparison with statewide standards from 1966 as stated by Pávek (1977).

TABLE 6
Pull-ups (number)

Age	Boys 1966 CR			Boys 1968 OL		Boys 2002 OL		
	n	\bar{x}	s	n	\bar{x}	n	\bar{x}	s
12	673	3.39	2.39	87	2.94	78	3.16	1.94
13	821	4.05	2.76	85	3.37	68	3.47	3.00
14	964	4.66	3.03	45	5.00**	71	3.93	2.82
15	936	5.40	3.13	88	6.42**	84	5.24	3.25

(*p < .05. **p < .01.)

CONCLUSION

Comparison of the average values of the somatic and motoric development of present-day boys in the Olomouc region with the results of a statewide study of the physical performance of youth in 1966 (Pávek, 1968) and the study of Olomouc boys in 1968 (Kubánek, 1971) basically confirmed the present knowledge of somatic and motoric development of the present-day population of children and youth.

The results confirmed a positive secular trend in the body height of boys from 1966 to 2002. Considering body weight, no noticeable changes were found; we can speak rather about a stagnation. The results confirmed the unequal development of body height and weight in the observed sets of boys within the past 36 years, which has been observed for several decades (Bláha, Vignerová, Kobzová, Krejčovský, & Riedlová, 2003; Moravec et al., 1990; Vignerová et al., 2005).

The development trend of motoric performance in the compared motoric tests of boys in the Olomouc region has not remarkably changed since 1966 and for the non-sporting population this is a constant state. The results confirm the fact that present-day boys of 7 to 15 years of age achieve almost the same motoric performance in comparison with the boys of the same age in 1966 (Pávek, 1968) and 1968 (Kubánek, 1971). Similar conclusions have been found by Měkota (1985), Moravec et al. (1990) and others.

The finding of stagnation of the motoric performance of boys is probably caused by the present way of life that offers to children and young people a number of time consuming activities, which results in the decreas-

ing of motoric stimulation in their daily programmes; as well as by a lower involvement of young people in organized forms of sports activities in their leisure time (Frömel, Novosad, & Svozil, 1999) and a predominant sedentary lifestyle that leads to hypokinesia with all its consequences.

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**SEKULÁRNÍ TREND V SOMATICKÉM VÝVOJI
A MOTORICKÉ VÝKONNOSTI CHLAPCŮ
V OLOMOUCKÉM REGIONU
ZA POSLEDNÍCH 36 LET
(Souhrn anglického textu)**

Ve své studii autor analyzuje změny somatického vývoje a motorického výkonu chlapců ve věku 7 až 15 let z Olomouckého kraje v průběhu posledních 36 let. Autor konstatoval pozitivní fungování sekulárního trendu v oblasti tělesné výšky. Současní probandi vykazují významně větší výšku, ale téměř tutéž hmotnost jako chlapci téhož věku před 36 lety. Při monitorování změn motorického výkonu autor konstatoval, že v běhu na 50 m, ve skoku dalekém z místa odrazem snožmo, v hodu těžkým míčem a ve shybu dosahují současní probandi totožných výsledků jako chlapci před 36 lety. Závěrem autor konstatuje, že nedošlo k zlepšení vývoje motorických schopností a že naopak u chlapců ve věku od 7 do 15 let z Olomouckého kraje dochází ke stagnaci vývoje rychlostních a silových schopností.

Klíčová slova: sekulární trend, chlapci ve věku 7 až 15 let, motorické schopnosti, motorické testy, motorický výkon.

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THE CORRELATION OF SPORTS ACTIVITY AND EATING HABITS IN PRESCHOOL CHILDREN AND THEIR PARENTS

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The aim of this research was to analyze sports activity and eating habits in preschool children and their parents. We were interested in the correlation between parents' and preschool childrens' eating habits and sports activity.

A questionnaire consisting of 32 questions was used to interview 93 parents of three to five year old children from 3 Slovene kindergartens. The data was processed by the SPSS program, calculating the frequency and contingency tables.

We have established that nutrition of the majority of preschool children is regular and proper; despite the fact that quite a few five year old girls and 3 year old boys have an increased BMI (body mass index). Their parents' eating habits are far from exemplary though – over 50% eat only 2 to 3 meals a day. Even though no statistically characteristic correlation was ascertained, the results show that children whose parents are sports active have more adequate nutrition than those children whose parents are not sports active. It is statistically characteristic that parents, who are more sports active, involve their children in sports more. The majority of them also spend their holidays actively.

We are of the opinion that at the time when children are still prone for parents' and teachers' influences, children should adopt a positive attitude towards a sports active way of life and healthy nutrition which represent the fundamental condition for a normal way of life without any unnecessary troubles due to harmful habits and modern diseases.

Keywords: Preschool children, parents, sports activity, eating habits.

INTRODUCTION

Obesity is a growing problem in contemporary society. The reasons are various ranging from genetics, metabolism processes, social and economic standards, psychological reasons, and lack of exercising to irregular nutrition. Lack of exercising in particular is the factor that causes an increase in obesity and diabetes, while genetics is among the prevailing factors causing obesity (Bratanič, 2000). Of obese children, 40 to 50% come from families where one of the parents is obese, and 80% of obese children come from families where both parents are obese. The proportion of obese children where both parents have normal body weight is 10%. Losing the extra body weight is closely related to regular sports activity, whereas irregular sports activity and quick diets do not produce satisfactory results (Battelino, 2000).

Experts are of the opinion that Slovene national cuisine includes all the good eating habits. Nutrition used to be based on meals prepared from grains and vegetables, meat was eaten on Sundays and holidays only, and people used to have regular fasting days. Unfortunately, the plain country meals have almost disappeared from our dining tables, and like the rest of the modern world, Slovene people eat more and more unhealthy fast food

(Jurovič, 2003). An increased interest in a healthy way of life, which combines more suitable nutrition and more physical activity, is noticeable in public though. However, we cannot overlook the fact that nutrition organizers in kindergartens and schools still follow standards over thirty years old. The nutritional and caloric values of these meals are way beyond today's standards (Sušnik, 2005).

Up until today, the Ministry of Education and Sport has not yet updated the standards for planning meals in Slovene kindergartens and schools. We may be following the British government's example, which is planning to withdraw all food substances containing more than 10% fat. This way, the "black list" will include all fizzy and sweet drinks, hamburgers, puddings, and chocolate desserts, cakes, French fries and the like. The British government will increase the financial contribution for meals; therefore, meals will contain more fruit and vegetables of the local distributors, who will be obliged to undertake certain food production standards. These changes have proved to be successful especially because the main initiator was the celebrity Jamie Oliver (Sušnik, 2005).

Nutritional experts, among others, also blame the advertising industry that pushes to sell every food regardless of how healthy or unhealthy the food is (Sturm,

2002). For advertising food, the food industry spends approximately 420 per consumer a year, while less than 1 per consumer a year is spent for promoting healthy food. Positive examples are the Scandinavian countries (Norway, Sweden). They have decided to prohibit television advertisements for children. The majority of other countries have introduced numerous incomplete and sometimes cross-covering educational and promotional initiatives with nutritional instructions. It is not just the advertising industry that should be blamed. The internet, the availability of fast food restaurants and food vending machines, and above all, lack of movement, add a lot to this problem (Blenkuš, 2001). Parents play here a very important role, too. Very concerning in Slovenia are the facts that 30% of boys and 38% of girls come to school without having breakfast, and that only 10 to 15% of high school students are signed up for school meals.

Healthy, balanced and quality meals, combined with an active life style in childhood and adolescence, are the essential factors for appropriate children's physical and mental development and for a quality life (Strel, Kovač, Leskošek, Jurak, & Starc, 2002). Unfortunately, there are examples where laws and regulations are not followed. By law, primary schools must employ one person for planning school meals for every 420 pupils (for schools with fewer pupils, a corresponding share). In her study, Zakotnik (2005) has stressed that only 382 (79%) of 485 primary schools in Slovenia have an organizer of school meals, and only 34% of these employees have the required qualifications. School meals planning in the rest of the schools is done by history, geography, and math teachers, even by secretaries. In kindergartens, meals organization is less of a problem, though they too follow standards and norms prepared by the Kindergarten community 23 years ago. Nutrition in kindergartens is integrated into the educational process, the purpose of which is to assure adequate meals, accustom children to healthy food, encourage independency and assure an encouraging atmosphere at meal times. Education for healthy nutrition namely does not take place only during actual consumption of meals; it is a process integrated into a variety of activities.

Sports or movement activity in general plays a significant role in life. When talking about people who are sports active, this usually means no unhealthy food, alcohol, cigarettes and many other bad habits that are too frequent in the "domain of the modern man" (Wang, 2001). Sport helps to suppress negative factors when already present, or helps prevent them from occurring. Sport is a way to enrich one's life at any age, early or late.

The research by Pišot, Fras and Zaletel-Kragelj (2005) has shown that 41% of the Slovene population does not even practice one single sport or recreational activity. Despite this, an encouraging fact is that in the past few years records show an increase in the number of sport-

recreational activities, in the percentage of sports active population and in regular and frequent sports activity (Sila, 2005). There are fewer people who are inactive and more of those who are active and practice regularly. The ratio among inactive, occasionally active and regularly active is around 4:3:3. An increased number of active women is also very encouraging, meaning a significant decrease in sex distinction. There is a drop of sports activity related to the population getting older, primarily among occasionally active individuals. The regularly active population is normally faithful to an active life style, even in late ages. Sports activity is still strongly related to social status, primarily defined by education and income. The higher the social status, the more often individuals are sports active. Comparing Slovenian results with other European countries shows that Slovenians are far ahead of the Mediterranean countries, also ahead of the central European countries, but behind the northern and Nordic nations. According to the 2001/2002 international research paper "Health behavior in school aged children", Slovene children aged 11 are on average sports active at least one hour a day, approximately 4 days a week. When older, the number of days when children are active at least one hour a day is decreasing. A similar situation is shown by the research on physical characteristics and movement activities of children. The results have shown that the numbers of hours per week, including PE at school, 11 to 14 year old pupils are sports active is approximately five and a half hours. Decreasing sports activity when children are getting older is present in various countries and regions across Europe. On one hand, the number of days per week children are sports active (particularly significant with girls) is decreasing, while on the other side, boys compared to girls of the same age are sports active more frequently (Zakotnik, 2005). The research by Kropelj and Videmšek (2003), studying sports activity among four to six year old children in the Ljubljana region, has shown that 50% children at this age are not involved in any activity. About 25% children are sports active (organized sport activities). The research has also ascertained that children whose families spend holidays inactively, are less frequently sports active as well. Studying the sample of parents of preschool children from around Slovenia, Kropelj and Videmšek (2002) have ascertained that there are certain factors which increase sports activity in children that their parents can directly influence: parents being sports active, active holidays, getting used to social gatherings, and the parents' positive opinion about sport.

Practicing sport in childhood and adolescence are benefits for a lifetime. Experts believe that the problem of wide-spread cardio-vascular diseases today has roots in the childhood period. Inadequate exercising extensively contributes to excessive body weight, high cholesterol level and high blood pressure. All of these

symptoms may be present already in adolescence and represent a high risk of developing serious heart diseases later in life (Willet, 2001). If alcohol, cigarettes and unhealthy nutrition are added, the risk of developing various diseases increases highly.

Childhood and adolescence are the most significant periods of growing up. Growing up into an adult person can be developed through sport and its specific movement activities, and through proper eating habits (Uršič-Bratina, 2000a). As the process of socialization starts in childhood, the family plays a very important role in developing a child's personality. Knowing that parents today are often overloaded with work and have very little time for raising children, the role of a kindergarten or school is thus even more important. Children can often adopt many bad habits in an inappropriate environment. Kindergartens and schools are a kind of a counterpoise, trying to guide children in the most appropriate way. Kindergartens and schools should help individuals to develop the potentials they possess, in order to be able to enter and start an independent life based on their own capabilities, having high self-esteem and strong determination (Vrba, 2000).

Since the problems and issues described here are most prevalent and interesting, we decided to carry out a research project to analyze the sports activity and eating habits of three to five year old children. We were interested in the correlation between parents' and pre-school children eating habits and sports activity.

METHOD

Participants

The questionnaire was completed by 93 parents whose children visit 3 Slovene kindergartens (region Koper). The children are aged three to five.

Instruments

Data was obtained with a questionnaire including 32 (closed type) questions (resumed from: Pogelšek, 2006).

The sample of variables is as follows:

1. Child's sex?
2. Child's year of birth?
3. Child's weight?
4. Child's height?
5. Parents education?
6. Are you satisfied with your child's weight?
7. How many meals a day do you usually have?
8. How many meals a day does your child have?

9. Does your child have breakfast before going to kindergarten?
10. Where does your child most often eat when he/she returns from the kindergarten?
11. How often do you visit a fast food restaurant?
12. Do you eat seasonal fruit and vegetables?
13. Do you pay attention to the content of the meals for your child?
14. How many times a week do you prepare the following foods for your child?
15. Do you accustom your child to scheduled meals with appropriate intervals between meals?
16. Do you allow your child to have sweets and snacks between meals?
17. Do you manage to persuade your child to taste different foods?
18. What is the easiest and most frequent way you teach your child to get accustomed to good eating habits?
19. How many times a week do you offer your child an industrially prepared meal?
20. Why do you offer your child an industrially prepared meal?
21. Do you think your child is picky?
22. Ways and types of sports activity?
23. How often do you practice sport or are you sports active?
24. How many hours a day does your child spend outdoors when he/she returns from the kindergarten?
25. How do you spend your holidays?
26. Do you think your child is active enough (playground, sandpit, playing with a ball, running, cycling, playing with friends...)?
27. Do you encourage your child to play and to undertake movement activities?
28. Are there any clubs or associations in your town, which organize sport activities for children?
29. Does your child visit any of the organized sports activity?
30. How many times a week are you sports active with your child?
31. If your child shows interest in a certain sport, would you sign him/her up to do this sport?
32. What is your opinion about influences of sport on children?

Procedure

The data was processed by SPSS software. Frequency and contingency tables were generated with the help of FREQUENCY and CROSSTABS sub-programs. The probability relations among the variables were tested by contingency coefficient. Statistical characteristics were evaluated at a 5% risk level.

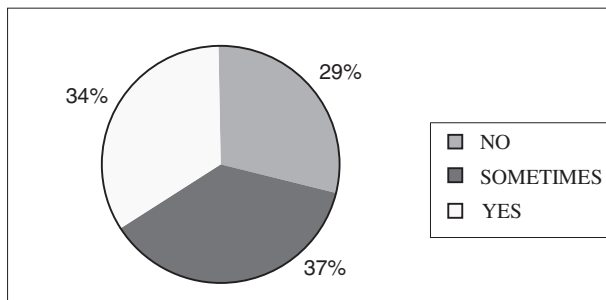
RESULTS

The sample includes randomly selected parents of three to five year old children of different education levels. The majority of parents have high school education (43%), following are parents with university education (40%), and the lowest percentage is those with vocational (11%) or primary school education (5%). Two thirds of these parents practice sport recreationally and irregularly, 20% practice recreationally and regularly (at least two times a week), and 15% do not do any sport.

42% of parents have three meals a day, 29% have four and only 19% have five meals a day. 10% of parents have only two meals a day, and none of the parents have more than five meals a day. The situation with children is slightly different; 47% have five meals, 39% have four meals, 11% have only three meals, and 3% have six or more meals a day. Before going to a kindergarten, only one third of children regularly have breakfast, 37% have breakfast occasionally, and as many as 29% never have breakfast (Fig. 1).

Fig. 1

Percentage of children having regular breakfast before kindergarten



Even though no statistically characteristic correlation was ascertained, the results show that children whose parents are sports active have more adequate eating habits. Parents, whose children have more than four meals a day, are sports active at least once a week. Parents' regular sports activity however does not influence children having breakfast; among these are namely parents who are sports active at least twice a week. The reason may be the fact that the majority of children come to kindergarten just before breakfast time, so they do not eat at home.

When they return from kindergarten. Of participating parents, 50% stated they never visit fast food restaurants, 36% visit fast food restaurants once a year, and the rest of them more often whereas 6% of the parents take a child to a fast food restaurant even one to two times a week, or every day. Almost all parents (95%) make sure their children have seasonal fruit and vegetables, but only 15% always pay attention to the content of children's meals (TABLE 1).

TABLE 1

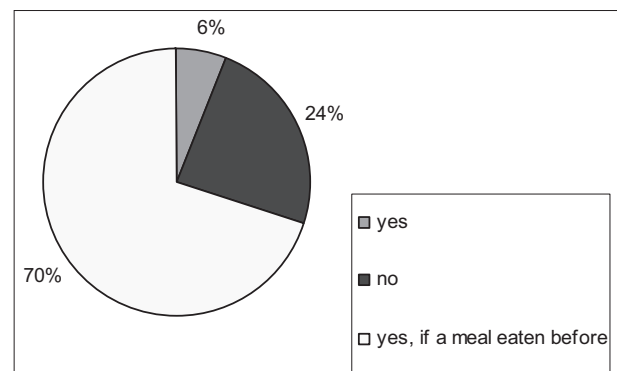
Pay attention to contents of children's meals

Attention	% of answers
No	3
Sometimes	37
Often	45
Always	15

Two thirds of parents prepare meat for their children four times a week or every day. Every day, only 77% parents offer children fruit and vegetables, 87% have dairy products every day, and 71% have bread, cereals, legumes or potatoes, whereas 8% of parents offer their children a dessert, chips or fizzy drink every day, one third of children get a dessert once a week and 9% never. Although 25% parents do not allow having sweets and snacks between meals, 70% allow this, provided that a child eats up the meal (Fig. 2). Only 5% of parents cannot persuade their children to taste different foods, over 50% manage to persuade them occasionally, 41% manage every time. They answered the question "How do they manage?" as follows: most parents (39%) explain to their children how beneficial and healthy the food is, 36% parents try to act as a good example, only a small percentage of parents answered they first taste the food themselves, or they try to trick their children, they promise a reward or they threaten a child. A little over one third of parents think their children are picky. Whereas 82% offer their children industrially prepared meals only once a month or less frequently, 14% offer such meals once a week and 4% offer such meals every day, usually due to a lack of time. These answers coincide with other results on children's eating habits - a majority of parents ensure a regular eating schedule, they do not eat in fast food restaurants and have varied meals including seasonal fruit and vegetables.

Fig. 2

Snacks in between meals



Based on the table of percentile distribution to estimate BMI (body mass index) in children and adolescents (Bratina, 2000b), overeating is estimated in those children whose BMI exceeds the 95th percentile according to their age and sex (TABLE 2). This research has established that three to four year old girls of the sample studied here, on average have adequate nutrition, the BMI of 75% five year old girls is above average, while in 25% cases the BMI even exceeds the 95th percentile which is concerning. The average BMI (ratio between body mass and the square of height) in five year-old girls of the sample studied is 17.06 kg/m² (TABLE 3). The value does not exceed the 95th percentile, however it is getting close. The situation is quite the opposite with boys: four to five year old boys have proper nutrition, while as many as one third of 3 year old boys have BMI above average, and 20% even exceed the 95th percentile (TABLE 4). The results show that the majority of parents (90%) are satisfied with their children's weight. Based on the above findings we are of the opinion that quite a few parents are satisfied with their children's weight even though they are overweight.

TABLE 2

The body mass index (BMI) in 3–5 year old boys and girls, National health and nutrition examination survey (Uršič-Bratina, 2000b)

BOYS				GIRLS			
AGE	95. P	50. P	5 P	AGE	95. P	50. P	5 P
3 years	18.4	16	14	3 years	18.3	15.6	13.9
4 years	18.1	15.8	13.8	4 years	18.2	15.4	13.6
5 years	18	15.4	13.7	5 years	18.3	15.3	13.5

P = percentile

TABLE 3

Basic statistical parameters: body mass index (BMI) – girls (kg/m²)

Age	Average	Minimal result	Maximal result	Standard deviation
3 years	15.09	10.96	18.00	2.53
4 years	15.75	12.70	19.95	1.96
5 years	17.06	12.53	25.42	3.46

TABLE 4

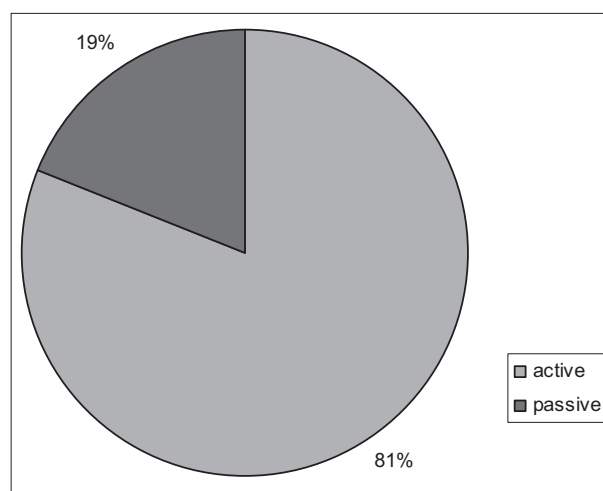
Basic statistical parameters: body mass index (BMI) – boys (kg/m²)

Age	Average	Minimal result	Maximal result	Standard deviation
3 years	16.43	13.20	20.99	2.27
4 years	15.85	13.22	22.22	2.30
5 years	15.77	14.83	20.83	1.96

When they return from kindergarten, the majority of children (even 93%) spend more than one hour a day outdoors. The same percentage of parents are of the opinion that their children are active enough and they get enough movement activities. Also, 81% spend active holidays, too (Fig. 3). Even though 79% parents stated that they encourage their children to participate in movement activities, 18% do not know of any sport clubs or associations in their town. Over 50% of children do not visit organized sport activities. Nearly all the parents are sports active with their children; the majority (41%) 2 to 3 times a week, 23% at weekends, 17% even every day (TABLE 5). Parents who are more sports active, are statistically characteristically more active with their children, too (TABLE 6); most parents (29%) who are active at least twice a week, are more sports active with their children, take them to trips, play ball with them, cycle, etc. Those parents who are active less than once a week, more often take time for their children at weekends or once a week.

Fig. 3

Ways of spending holidays

**TABLE 5**

Parents sports active with their children

Answer	% of answers
None	3
1 × week	16
2–3 × week	41
Every day	17
Weekends	23

TABLE 6
Parents sports activity according to sports activity with their children

How often are you sport active with children?	How often are you (parents) sports active?						
	Never	1 time to couple times a year	1 to 3 times a month	1 time a week	2 to 3 times a week	4 to 6 times a week	Every day
	F %	F %	F %	F %	F %	F %	F %
None	1 33.3	0 0	1 33.3	1 33.3	0 0	0 0	0 0
1 time a week	0 0	3 20	7 46.7	2 13.3	1 6.7	1 6.7	1 6.7
2 to 3 times a week	1 2.6	1 2.6	8 21.1	11 28.9	13 34.2	2 5.3	2 5.3
Every day	0 0	2 12.5	2 12.5	2 12.5	3 9.5	2 12.5	5 31.3
Weekends	0 0	3 14.3	6 28.6	8 38.1	2 9.5	1 4.8	1 4.8
Contingency coefficient: 0.568			Statistical characteristic: 0.007				

If a child shows interest in a certain sports activity, the majority of parents would sign him/her up in the following cases: if they could coordinate their schedules, if the price was affordable or depending on the sports activity. Nearly all the parents (97%) are of the opinion that sport has a positive influence on a child's development and health; some parents commented that the activity has to be appropriate and professionally conducted.

DISCUSSION

Parents of the three to five year old children included in this research, have a rather high level of education – nearly half of them have university education. The percentage of those who are not sports active is lower compared to the results obtained in a public opinion survey (Sila, 2005); therefore, it was expected that the sample studied here – parents of three to five year old children, are adequately informed about healthy nutrition and the importance of sports activity, and how these factors influence a child's integral development and one's health respectively.

Based on the obtained results it can be seen that the majority of children have proper nutrition, meaning that they have at least four meals a day, and that their meals are primarily based on fruit, vegetables and dairy products. The majority of parents provide for regular intervals between meals and offer their children snacks only after they have eaten the main meal. Even though parents provide for a sufficient number of meals for their children, they are not so consistent about their own meals. Only one third of children eat breakfast at home. It is assumed that those children who come to kindergarten just before breakfast time do not eat

breakfast at home. Results of various research projects (Wang, 2001) indicate that children's productiveness is decreased by about 20% if they do not have breakfast. Sentočnik (2005) is of the opinion that a unified nutritional approach of a child's guardian leaves positive effects on eating habits later in life. We can develop the child's taste and attitude towards food up until they are five years old. This is the age when a child develops nutritional patterns which cannot be changed easily at a later time.

Children included in this research on average have proper nutrition. An above average BMI was found in five year old girls and three year old boys. Despite this, the majority of parents are satisfied with their children's weight. Bošnjak (2005) estimates that over 30% of European children aged between 7 and 11 are obese. They mostly come from Italy, Portugal, Spain and Malta. According to the International Association for the Study of Obesity, the number of obese children in Europe is increasing by at least 400.000 a year. Obesity is complex and the most wide spread disease of our modern time – in the developed countries, 50% of adults and 25% of children aged between 10 and 17 are obese (Sentočnik, 2005). The 2003 research paper on Slovene children and adolescent nutrition has shown that 9% of boys and 8% of girls are obese (Pavlič, 2006). According to Accetto and Bulc (2005), 43% of men and 54% of women from Ljubljana are obese.

The majority of parents are aware of how significant movement activities are for children's development – almost all of them spend more than one hour outdoors with their children and in addition, families spend their holidays actively. Despite this, over one half of children do not visit organized sport activities, and a lot of parents do not know of any organized sports activity in their town.

Parents, who are more sports active, are more active with their children. According to Žibret (2005), if parents are a good example, this is very significant for a child's attitude towards sport. The research on sport habits of primary and secondary school children has namely shown that children practice sport if their parents are sports active themselves. In sports inactive families, as many as 53% children are active only at PE classes in school. Sports active parents regularly or frequently direct their children to sign up for organized sport activities, since as many as 40% children regularly practice in different sport clubs.

We can change our habits – bad and good alike. We wish good eating and sport habits that we give to our children to remain a part of their lives forever. Therefore, we must, every day, pay special attention to influences from society – primarily the good examples of everyone in contact with children (kindergarten and school teachers, as well as coevals). A huge influence is represented by advertising information and information in the media about fashion trends (Robinson, 1998). The fact is that good eating and sport habits are far more difficult to be given up than going over from bad to good habits. We are aware that the bad eating habits of the Slovene population (adults and children) are related to inappropriate eating schedules and a consumption of food which is too high in calories. We must thus search for a way; first of all we must get people to know about regular daily meals and about proper food selection of what they eat. Koch (2002) quotes different studies which show that people who eat healthily, more often also lead a more healthy way of life. Obviously these people are more conscious of what health means for their qualitative way of life. A healthy life style is namely much more than just eating healthily (Kozjek, 2005). One of the most important foundations for a healthy life is undoubtedly also regular sports activity.

The experts think it is the government who is responsible for proper nutrition and sports activity of children in educational institutions. The government must set a legal framework, providing appropriate standards and norms in scope of organization, employment of trained specialists and regulation of the food's quality. It must also enable or ensure appropriate daily sport activities for young people. It is essential of course that the execution of these provisions is supervised.

At the time when children are still prone to parents' and teachers' influences, children should adopt a positive attitude towards a sporty way of life and healthy eating which represent the fundamental conditions for a normal way of life without any unnecessary troubles due to harmful habits and modern diseases.

We are aware that this research is just a small piece in the mosaic representing the study of eating habits and sports activity in young people. The sample of subjects

studied here is relatively small and not representative for Slovene children and their parents. In spite of this, we have established interesting conclusions, valid for this sample of subjects. Future research on the eating habits and sports activity of young people should be more thoroughly studied and the assumptions stated here should be analyzed.

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**KORELACE SPORTOVNÍ AKTIVITY
A STRAVOVACÍCH NÁVYKŮ
U DĚTÍ PŘEDŠKOLNÍHO VĚKU
A JEJICH RODIČŮ**
(Souhrn anglickéh textu)

Cílem výzkumu bylo analyzovat sportovní aktivitu a stravovací návyky u dětí předškolního věku a jejich rodičů. Zajímala nás korelace mezi stravovacími návyky rodičů a dětí předškolního věku a sportovní aktivitou.

Pro dotazování 93 rodičů tří až pětiletých dětí ze tří slovinských školek byl použit dotazník obsahující 32 otázek. Údaje byly zpracovány programem SPSS, který počítá frekvenci a kontingenční tabulky.

Zjistili jsme, že výživa většiny dětí předškolního věku je pravidelná a vhodná, přestože některé pětileté dívky a tříletí chlapci mají zvýšený BMI (index tělesné hmotnosti). Stravovací návyky rodičů však nejsou ani zdaleka vzorné – přes 50 % má pouze 2 až 3 jídla denně. Přestože nebyla potvrzena žádná statisticky charakteristická korelace, výsledky ukazují, že děti, jejichž rodiče jsou sportovně aktivní, mají vhodnější výživu než děti, jejichž rodiče sportovně aktivní nejsou. Statisticky charakteristické je, že rodiče, kteří jsou sportovně aktivnější, zapojují své děti do sportu ve větší míře. Většina z nich rovněž tráví aktivně prázdniny.

Domníváme se, že v době, kdy ještě podléhají vlivu rodičů a učitelů, by děti měly přijmout pozitivní přístup ke sportovně aktivnímu způsobu života a zdravé výživě, které představují základní podmínku normálního způsobu života bez zbytečných problémů způsobených škodlivými návyky a civilizačními chorobami.

Klíčová slova: děti předškolního věku, rodiče, sportovní aktivita, stravovací návyky.

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We look forward to our further cooperation!

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