



Quality of Life of Children Engaged in Regular Physical Activities

Djordje Arsenovic¹, Bojan Djokic², Zoran Kovacevic², Dejan Stevanovic³, Katarina Janicijevic⁴, Mirjana A. Janicijevic Petrovic⁵, *Svetlana Radevic⁴, Snezana Radovanovic⁴

1. Student Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia
2. Department of Internal Medicine, Clinical Center of Kragujevac, Kragujevac, Serbia
3. Department of Psychiatry, Clinic of Neurology and Psychiatry for Children and Youth, Belgrade, Serbia
4. Department of Social Medicine, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia
5. Department of Ophthalmology, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia

*Corresponding Author: Email: cecaradevic@yahoo.com

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Abstract

Background: We aimed to examine the quality of life of children who engage in regular physical activities.

Methods: We conducted a cross-sectional study with intersectional 301 children (182 boys and 119 girls) involved in regular sporting activities and the control group of 100 children (67 boys and 33 girls), not involved in extracurricular sports. Children in both groups were from 8 to 13 years, attending elementary school, and without any associated illnesses. The quality of life (QOL) was assessed using the Quality of Life questionnaire Kidscreen-27 version for parents. For comparison of groups, we used χ^2 test, and for comparison of mean values among groups we used ANOVA test.

Results: More boys were engaged in sport than girls and the choice of sport is gender-dependent ($P < 0.01$). Boys preferred collective sports, while girls were more oriented towards individual sports ($P < 0.01$). A significant statistical difference in the mean values of the socializing dimension was given to children who trained football ($P = 0.04$) and basketball ($P = 0.02$). In children engaged in volleyball, a statistical difference in the mean values was observed in all dimensions of the questionnaire. In children who trained water polo, a statistically significant difference in the mean values for dimensions of health ($P < 0.01$), mood ($P < 0.01$) and friendship ($P = 0.01$) was seen.

Conclusion: KIDSCREEN scores were significantly higher in the examined group than in the control group, with a statistically significant difference between scores for different sports. Children involved in regular extracurricular physical activities had better QOL.

Keywords: Quality of life; Children; Extracurricular physical activity; Questionnaire

Introduction

Physical activity has a very important role in the psycho-physical development of a child (1). It includes physical education, active and recrea-

tional sports. Physical activity allows meeting the need for play and movement. The health benefits of physical activity are multiple, such as maintain-



ing a desired body weight, blood pressure, maintenance of serum cholesterol and glycaemia levels (2). Physical activity and regular physical exercise can bring a lot of benefits in terms of preventing and preserving health, thus improving quality of life (QOL) (3). There is an observed increase in a number of obese children and children with some postural deformity (4). Nowadays, children have more incorrect and too abundant food intake and the problem of overweight and obesity has been taken to an epidemic level (5). Several studies have shown that obesity has a negative effect on QOL (3-5). Good physical fitness in children is considered an important parameter of health (6).

Several studies have analyzed the relationship between physical fitness and quality of life in children (6, 7). There are few studies dealing with QOL in the population of children engaged in sports. Children and adolescents with higher BMI have a proportionally lower QOL (8). Improving cardio-respiratory fitness and muscle strength could be particularly useful for improving QOL and children (9). Children who achieved the recommended level of 60 minutes of moderate-to-vigorous intensity physical activity (MVPA) per day have better wellbeing than less active children (10). Parental physical activity (PA) is positively associated with children's extracurricular sport participation. The type of PA practiced by the parents was not related to boys and girls participation in sport (11). During development, sport positively affects physical, social and mental health in children and adolescents with physical deformity and some chronic disease (12).

One of the most recently developed and frequently used questionnaires for QOL assessment in children and adolescents is the KIDSCREEN Questionnaire (13). A recent study examining the effect of physical-activity intervention on children's health-related quality of life using KIDSCREEN-27 has showed a significant effect for psychological wellbeing, social support and peers, and school environment (14). The sensitivity of the KIDSCREEN-27 tool, as regards to reflecting change in quality of life related to physical activity in studies, remains poorly documented.

The strength of the KIDSCREEN questionnaire is that it provides clarity about specific aspects of the children's environment that may be relevant to health and well-being promotion. A few studies have found KIDSCREEN-27 to be applicable to different populations across different countries (15-17).

We aimed to examine the QOL of children engaged in regular physical activity through the particular sport.

Materials and Methods

Study design and population

We conducted a cross-sectional study of 301 children involved in regular sports and the control group of 100 children not involved in extracurricular sports. The research was conducted in the period from January 1, 2019 to March 31, 2019. All children were 8 to 13 years, attending elementary school on the territory of the city of Kragujevac, Serbia and without any reported associated illnesses or disability. Children in the control group had physical activity only at classes of physical education at school. The investigated group of children was engaged in extracurricular physical activities in sport clubs. All children in the examined group had been trained the chosen sport for at least 3 years.

Our survey included popular collective ball sports as well as basic sports such as swimming and sports gymnastics. Children had a minimum of 3 to 6 hours of training per week. The study involved several sport clubs. We divided all children considering gender and type of sport (i.e., basketball, football, volleyball, swimming, water polo and gymnastics). We measured body mass index (BMI/kg/m²) of each child based on body height and body weight and the BMI results were interpreted using a percentile curve (18). Based on the type of activity, children were subdivided in groups of those dealing with collective sports and those dealing with individual sports. Based on the type of sport, we grouped them into basic sports and sports games.

Questionnaire

The QOL of the respondents was assessed using the QOL questionnaire, the Kidscreen-27 version for parents (13). It represents one of three generic questionnaires, depending on the number of subjects (Kidscreen-52, Kidscreen-10, Kidscreen-27) that examines the quality of life related to health of children and adolescents. There are questionnaire versions filled by children alone, as well as versions filled by their parents. We have opted for a version filled out by parents and used the Serbian version (19). The Kidscreen-27 contains 5 dimensions: 1) physical activity and health, 2) general mood and feeling, 3) family and leisure time, 4) friends, and 5) school and learning. When completing the questionnaire, the parents responded to the claimed statements on the five-degree Likert type scale, expressing their agreement with the claimed assertion. The scales are as follows: none (never) - 1 point, a little (rarely) - 2 points, central (sometimes) - 3 points, very (often) - 4 points, exceptional (permanent) - 5 points.

Data analysis

The results obtained for each group of children are compared with the average result of the corresponding population on the same scale, with results ranged around the arithmetic mean. Evaluation values below this limit are considered to be indicators of a low quality of life, and above the indicator of a high quality of life. The results are expressed in T values and percentages (20). A higher score indicates on higher QOL. Questionnaires were distributed to all clubs giving them a deadline of three weeks to submit legally filled questionnaires.

In addition to the questionnaire, the parents of the children also signed the agreement on voluntary participation in the study. This research was approved by the Ethics Committee of the Faculty of Medical Sciences, University of Kragujevac (Number 01/19/854).

Statistical analyses

We used the statistical program SPSS ver.19 (IBM Corp., Armonk, NY, USA). As statistical

methods we used frequency, mean value, standard deviation and median. For comparison of groups, we used χ^2 test and for the comparison of mean values among groups we used the ANOVA test.

Results

In the sample tested, out of a total of 301 respondents, there were more boys who were training in relation to girls ($P < 0.001$) (Table 1). The average age of the subjects was 10.53 ± 1.60 , and the average BMI was $18.87 \pm 2.24 \text{ kg/m}^2$. The control group consisted of 67 (67.0%) boys and 33 girls (33.0%), with an average age of 10.04 ± 1.24 years and an average BMI of $18.65 \pm 2.90 \text{ kg/m}^2$. As shown in Table 1, the distribution of the frequency of sports in the examined group was quite similar ($P=1.00$). However, there was a statistically significant difference in the selection of sports among boys and girls ($P<0.01$). In a group of boys, the following distribution of frequency in sports was: basketball 44 (24.4%), football 51 (28.3%), volleyball 26 (16.1%), swimming 27 (15.0%), water polo 29 (16.1%) and gymnastics 5 (2.8%). Girls had the following distribution: basketball 4 (3.4%), football was not trained by any girl (0%), volleyball 26 (21.8%), swimming 23 (19.3%), water polo 21 (17.6%), gymnastics 45 (37.8 %). In the examined group, collective sports in relation to individual sports (58.8% vs. 39.5%, $P < 0.001$) were much more represented, as well as sports games compared to basic sports (58.2% vs 40.2% $P<0.001$). Boys were choosing more collective sports than girls (72.2% vs 27.80%), while individual sports were slightly more represented in girls compared to boys ($57.0\% \pm 43\%$). A statistical difference was observed in relation to gender and type of activity ($P<0.001$). Sports games were more prevalent in boys than girls (71.9% vs 28.1%), while basic sports were somewhat higher in girls than boys (43.9% vs 56%). A statistical difference was noticed between the type of sport and gender ($P<0.001$).

Table 1: General study population data of the main group

| <i>Variable</i> | | | <i>n</i> | <i>P-value</i> |
|--------------------------------------|-------------------|------------|----------|-----------------|
| Gender | Boys | 182 (60.5) | n=301 | <i>P</i> < 0.01 |
| | Girls | 119 (39.5) | | |
| Age | Boys | 10.76±1.59 | n=301 | <i>P</i> =0.92 |
| | Girls | 10.18±1.54 | | |
| Body Mass Index (kg/m ²) | Boys | 18.82±2.24 | n=301 | <i>P</i> =0.95 |
| | Girls | 18.93±2.25 | | |
| Sport | Basketball | 50 (16.3%) | n=301 | <i>P</i> =1.00 |
| | Football | 51 (16.7%) | | |
| | Volleyball | 50 (16.3%) | | |
| | Swimming | 50 (16.3%) | | |
| | Water polo | 50 (16.3%) | | |
| | Sports gymnastics | 50 (16.3%) | | |
| | Collective sports | 180(58.8%) | | |
| Type of activity | Individual sports | 121(39.5%) | n=301 | <i>P</i> =0.001 |
| | Basic sports | 123(40.2%) | | |
| Type of sport | Sports games | 178(58.2%) | n=301 | <i>P</i> =0.002 |

Table 2 shows the mean values of different questionnaire segments in the examined and control group. Statistical analysis shows a significant sta-

tistical difference in the mean values of all questionnaire segments compared to the test and control group.

Table 2: KIDSCREEN scores of the questionnaire on the quality of life of the examined and control group

| <i>Kidscreen-27 items</i> | <i>MEAN (SD)</i> | | <i>P-value</i> | <i>95% Confidence Interval for Mean</i> | |
|---------------------------|------------------|---------------|-----------------|---|-------------|
| | Examined group | Control group | | Lower Bound | Upper Bound |
| Physical well-being | 4.68 (0.38) | 4.22 (0.57) | <i>P</i> < 0.01 | 0.33 | 0.58 |
| Psychological well-being | 4.54 (0.41) | 4.16 (0.53) | <i>P</i> < 0.01 | 0.26 | 0.49 |
| Parent relations autonomy | 4.61 (0.44) | 4.19 (0.55) | <i>P</i> < 0.01 | 0.29 | 0.53 |
| Social support and peers | 4.67 (0.42) | 4.21 (0.49) | <i>P</i> < 0.01 | 0.34 | 0.56 |
| School environment | 4.63 (0.45) | 4.24 (0.64) | <i>P</i> < 0.01 | 0.24 | 0.51 |

The mean values for KIDSCREEN scores for different sports are shown in Table 3. By comparing the mean values of each of the five dimensions of the questionnaire with different sports, we have come up with the following results. A

significant statistical difference in the mean values of the socializing dimension was given to children who train football (*P*=0.04) and basketball (*P*=0.02). In children engaged in volleyball, a statistical difference in mean values was observed

in all dimensions of the questionnaire (physical activity and health, general mood and feeling, family and leisure time, friends ($P<0.01$), school and learning ($P<0.001$). In children practicing swimming, there was no statistically significant difference in the mean values of the questionnaire dimensions. In children who trained water polo, a statistically significant difference in the

mean values for dimensions of health, mood ($P<0.001$) and friendship ($P=0.01$) was observed. In children with gymnastics, a statistically significant difference was noted in the mean values in the field of health ($P=0.02$), mood ($P<0.001$) and family ($P=0.02$). We have shown that the dimension of friendship dominates in all collective sports.

Table 3: Mean values for KIDSCREEN scores for different sports

| <i>Sports</i> | <i>Mean (SD)</i> | <i>P-value</i> | <i>95% Confidence Interval for Mean</i> | |
|------------------------------|------------------|----------------|---|-------------|
| | | | Lower Bound | Lower Bound |
| Basketball-water polo | 0.241 (0.07) | $P=0.02$ | -0.45 | -0.45 |
| Volleyball-sports Gymnastics | 0.239 (0.07) | $P=0.02$ | 0.02 | 0.02 |
| Water polo-sports Gymnastics | 0.292 | $P=0.002$ | 0.07 | 0.07 |

Discussion

This study showed that there were more boys who were engaged in sport than girls and that the choice of sport is gender-dependent. Boys preferred collective sports, while girls were more oriented towards individual sports. The KIDSCREEN scores were statistically significantly higher in the examined group than in the control group, and there was a statistically significant difference between the mean values for the Kidscreen-27 questionnaire in different sports. Underweight and overweight among Polish adolescents were associated with low QOL (21). In our study, no statistical evidence was presented in the state of nutrition of the exchange of the examined and control group. The reason for this can be a small sample of respondents. Health and good physical fitness are prerequisite for success in school and life. According to NAYS (National Alliance for Youth sports), one of the most popular extracurricular activities in children is sport (22). About 65% of children around the world are involved in out-of-school sports activities, 55% of American children are involved in youth sports, while this percentage among German children is even greater than 70% for the age of 6 to 14 years. In many countries, such as America,

these activities are subsidized by their republics (23). There are no studies in our area showing how many children of school age are involved in sports activities outside the school. According to the German Olympic association (24), 76% of boys and 59% of girls 7 to 14 years of age, are engaged in sports within the sports clubs. In our research, we also showed increased interest in boys for sports rather than girls. Meyer et al. in their experimental study have shown that physical activity contributes to better bone development in children (25). Doing sports also provides a more attractive physical appearance and greater self-confidence, builds greater emotional strength of an individual (26). In Germany, physical education is part of the educational program (27). Very rare children at school are in addition to sports. So kids who want to practice sports are referred to sports clubs in their surroundings. The most popular sports among German children are in soccer football 45%, gymnastics 14%, tennis 5%, handball 5% and athletics 5%. For girls, the most popular are gymnastics 37%, football 11%, riding 8%, athletics 7%, and swimming 6% (28).

Our research showed great interest in basketball and football among boys, while girls were more interested in gymnastics and volleyball, while girls

were not interested in football. We showed greater interest in swimming among girls (19.3%) than the above mentioned study. Dills, Morgan and Rottbof have shown a positive impact of physical activity and a pause on the learning process (29). The German child panel (GCP) dealt with the choice of sport based on the specific individuality of the individual and the characteristics of the environment (30). According to them, the children who train are on average taller than their peers, have better BMI and their parents are more educated (31). Our research showed a significant difference in all domains of KIDSCREEN questionnaires (physical, psychological, parenting, social and school) in children who deal with some sport in relation to the examined group. The German KiGGS cohort study "German Health Interview and Examination Survey for Children and Adolescents" which was carried out by the Robert Koch Institute dealt with the causal effect of children's participation in sports clubs on health, social welfare and education (32). Children with good health have better school success and higher social capacity and are more likely to engage in sports, which can later improve these characteristics (33). Activities in sports clubs can help children develop an initiative; reinforce inner motivation and a desire for success (34). Physical activity also develops curiosity, persistence, responsibility, self-criticism. Interaction with the team and peers promotes better social relationships, empathy, loyalty, team spirit (35). Participation in sports clubs encourages developmental qualities, especially in urban children who are deprived of free space, reduces time spent on TV and computer (36). Training sports is extremely useful for the proper psychophysical development of a child (37). The right choice of sports is very important for children of the younger school age (38). It is considered that the best time for a child to start with a sport is six years of age. In our research, we showed significantly higher interest in dealing with collective sports activities in relation to individual (58.8% vs 39.5%, $P = 0.001$). The choice should be made upon the individual characteristics of a child of his/her physical characteristics, stillness and

traits. Children with better anthropometric characteristics have a better predisposition for dealing with collective sports. They have more confidence and a greater desire to compete. In individual sports, a higher degree of concentration is needed, more patience and repetition (39, 40).

In this study, we dealt with four of the most popular collective sports: basketball, football, volleyball and water polo. This can be explained by the fact that boys were more encouraged to involve in collective sports than girls from the earliest age. In collective sports predominate natural forms of movement (running, jumping, throwing, capturing) which is combined with the ball and a larger number of players create a creative game that is dynamic and interesting. Children realize their need for movement, games, competition and mutual communication. They also realize their specific needs for affirmation, domination and belonging to the group.

Conclusion

KIDSCREEN scores were significantly higher in the examined group than in the control group, with a statistically significant difference between scores for different sports. Children involved in regular extra-curricular physical activities had better QOL.

Journalism Ethics considerations

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

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Conflict of interest

All authors declare no support from any organization for the submitted work; no financial rela-

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