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Analysis of the Behavioural and Emotional Profile of Adolescent Judo Practitioners

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Abstract

In recent decades, the number of social projects that use sports as a tool has been increasing dramatically, necessitating rigorous investigations into their immediate and long-term effects and the behavioural changes in children and adolescents who participate in these projects. This study aimed to assess the behavioural and emotional profile of adolescent judo practitioners. The participants of the Judo Social Project in São José do Rio Preto answered the Brazilian version of the "Youth Self-Report" (YSR/2001). In the analysis of scores, the borderline range was grouped with the clinical range to minimize the occurrence of false negatives, specifically, the number of adolescents with scores outside the clinical range on the YSR/11-18 scale (t scores ≥ 60 for the clinical range) who required psychological or psychiatric care. The scores on the anxiety and depression scale were significantly higher for female participants ($p=0.0431$). On the total scale of emotional and behavioural problems, 34.4% ($N=106$) of the study population had mean scores considered in the clinical range. Of these, the scores were found to be in the clinical range in 24.8% ($N=31$) of the female participants and 41% ($N=75$) of the male participants. The comparison between the sexes indicated that internalization symptoms (anxiety and depression) were more frequent in female participants, whereas externalization problems (rule-breaking and behavioural problems) were more frequent in male participants.

Keywords: adolescence, physical activity, health, judo

Introduction

Several studies have correlated physical activity and exercise with health benefits. A lack of physical activity, in turn, is associated with increased risks of cardiovascular disease, diabetes, obesity, hypertension, other causes of mortality (Centers for Disease Control and Prevention, 2010), and mental disorders (Rhodes & Mark, 2012). The association between mental disorders and physical inactivity (M.N. Baptista, A.S.D. Baptista, & Dias, 2001) is reinforced by studies on anxiety, depression, obsessive-compulsive disorder, and eating disorders, among others (Zschucke, Gaudlitz, & Ströhle, 2013), which are considered to be problems with significant personal, family, social, and economic impacts (Vianna & Lovisolo, 2009). In

the search for efficient and low-cost treatments with long-term benefits (Zschucke et al., 2013), physical activity and exercise continue to gain the attention of researchers, even for aspects related to prevention.

Olsen, Myklebust, Engebretsen, Holme and Bahr (2005) reported that physical activity has become an attractive therapeutic option and perhaps a prevention strategy due to several reasons, including fewer side effects, adaptability to clinical comorbidities and functional status of the patient, increased self-esteem, less stigma than psychiatric and psychological treatment, reduced need for pharmacotherapy, and decreased risk of cardiac and metabolic diseases.

Several authors have indicated that the effects of physical



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activity in children and adolescents are similar to those observed in the adult population (Baptista et al., 2001). In this respect, primarily physiological approaches or methods originally developed for adults are used for young people, although the validity of these methods has not been established for adolescents and children (Fleitlich & Goodman, 2000). Therefore, these therapeutic strategies should consider the differences between the target populations (Eime, Young, Harvey, Charity, & Payne, 2013) and evaluate different scenarios using qualitative and quantitative approaches with scientifically grounded studies (Chaddock-Heyman, Hillman, Cohen, & Kramer, 2014).

However, few studies have evaluated the correlation between physical activity and mental health among young people. Most studies have focused on emotional problems, particularly depression and anxiety. Furthermore, few studies have evaluated behavioural and social problems, and even fewer have addressed the phenomenon in a broader sense, including aspects related to internalization and externalization (Fleitlich & Goodman, 2000). The presence of emotional and behavioural problems in this age group and the limited practice of physical activity from youth to adulthood underscore the need to address the possibility of an association between these variables (Fleitlich & Goodman, 2000). Systematic reviews and meta-analyses have reported the benefits of physical activity on depression, anxiety, and behavioural problems in children and adolescents (Ekeland, Heian, & Hagen, 2005). However, the effect of physical activity and exercise on the mental health of individuals in this age group has not been elucidated (Ekeland et al., 2005).

Moreover, studies on this topic that use physical exercises as the main tool can help strengthen the protective factors (e.g., environmental, quality of life, social support, coping) and reduce problematic behaviours (Piccinelli & Wilkinson, 2000). Martial arts, such as judo, require specific psychological readiness to perform tasks. Emotional and mental states are subject to extreme oscillations during the fight. For young judokas, it is a challenge in a state of extreme tension to compete, to attack, and defend simultaneously, hiding their intentions from the opponent (Ziv & Lidor, 2013). The practice of long-term judo positively influences the “psyche” of young judokas, improving their concentration level, regardless of gender (Janowska, Wojdat, Bugajska, Paradowska, & Stepniak, 2018). There are many common beliefs regarding the social-psychological results of martial arts practice, ranging from very positive to very negative (Vertonghen & Theeboom, 2010). To the best of the authors’ knowledge, this is the first study to examine the behavioural and emotional profile of young judokas.

This study aimed to assess the behavioural and emotional profile of adolescents who participate in a judo social project in São José do Rio Preto, State of São Paulo, Brazil.

Methods

The study comprised 308 adolescents (183 boys and 125 girls) aged between 11 and 18 years (12.4 ± 1.54 years) who participated in the Judo Social Project “Sports for Children” developed in the city of São José do Rio Preto, Brazil. The project involved 16 centres located in different regions of the city and the provision of 60-minute judo classes two to three times per week. The study was approved by the Human Research Ethics Committee of the Medical School of São José do Rio Preto, Brazil (Decision No. 138/2011).

The inclusion criteria were informed consent by the par-

ticipants or guardians, age between 11 and 18, and enrolled in elementary education and the judo project. All project participants in this age group were invited to participate in the study.

The questionnaire was completed in class, on the premises of the judo centre, in the presence of researchers and the instructor responsible for the judo centre. The researchers assisted those who had difficulty reading the questionnaire.

The behavioural profile of the participants was evaluated using the Brazilian version of the “Youth Self-Report” (YSR) (Bordin et al., 2013). This instrument is a self-reported questionnaire, where individuals aged between 11 and 18 provide an overall assessment of their behaviour. The YSR consists of 105 items that assess the behavioural problems of the participants, and these items are grouped into eight syndrome scales, including anxiety/depression, withdrawal/depression, somatic complaints, social problems, attention problems, thought problems, rule-breaking behaviour, and aggressive behaviour. The sum of the first three items forms the internalization scale; the sum of the last two items forms the externalization scale; the total sum of the behavioural problems forms the full scale of emotional and behavioural problems. The instrument also contains open questions that assess the overall social competence and participation in activities such as sports and entertainment.

The YSR enabled the formation of groups using the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (Achenbach & Rescorla, 2007). These groups included affective disorders, anxiety disorders, somatic problems, attention deficit hyperactivity disorder, oppositional defiant disorder, conduct disorder, obsessive-compulsive disorder, and post-traumatic stress disorder. The YSR scores, even in the clinical range of the DSM scales, were not automatically equivalent to a diagnosis (Rhodes & Mark, 2012). Rather, they suggested the occurrence of problems in specific areas, helped identify children eligible for a detailed assessment, and confirmed the need for psychiatric or psychological care.

In this study, we analysed eight syndrome scales and the six groups guided by the DSM-IV, in which the rules are similar to those used in the validation study for the Brazilian population (Rocha, 2012). In the analysis of scores, the borderline range was grouped with the clinical range to minimize the occurrence of false negatives, meaning the number of adolescents with scores outside the clinical range on the YSR/11-18 scale (t scores ≥ 60 for the clinical range) who required psychological or psychiatric care. The raw scores (mean and standard deviation) were also evaluated and compared with those of the Brazilian validation study (Rocha, 2012). The instrument was validated for the Brazilian population by Rocha (2012). The Brazilian version is suitable for research on adolescents from all socioeconomic status, even those with family members with low education living in vulnerable regions (Rocha, Pereira, Arantes, & Silveiras, 2010). For analysis, the participants were placed into two groups: younger (11–14 years) and older (15–18 years); these groups were compared using the standards adopted in instrument validation for the Brazilian population.

The data were tabulated and analysed with descriptive statistics (mean, standard deviation, and relative frequency for all variables). Unpaired t -tests were used to compare the groups; p -values equal to or less than 0.05 were considered significant. The data were also presented as absolute and relative values.

Results

Although all adolescents enrolled in the project were invited to participate in the study, the estimated rate of non-participation was 5%. The most common reasons for non-participation were absence from classes in which data were collected and personal reasons. The mean period of adherence to the project varied between four months and three years, with an average period of judo practice of one year. The ethnic and racial distribution of the participants was 46.10% Caucasians and 53.9% African descendants, and family income ranged between R\$150.00 (ca USD 30) and R\$1,920.00 (ca USD 350) per month.

The results of the total scale of emotional and behavioural problems indicated that the mean scores were in the non-clinical range ($M=31.31\pm12.05$) for 202 adolescents (65.6% of the total sample). A total of 106 adolescents (34.4% of the total sample) had mean scores in the clinical range ($M=72.46\pm19.70$).

The analysis of the mean T scores on the YSR scale was compared in both sexes, and Table 1 shows the scores for the types of emotional and behavioural problems using the YSR scale in both sexes. Among the eight syndrome scales evaluated, only two showed significant differences between the sexes: anxiety/depression and rule-breaking behaviour.

Table 1. Adolescent participants of the Judo Social Project: differences in the scores obtained on the YSR scales for emotional and behavioural problems in both sexes

Scales	Male (N=183)	Female (N=125)	p
	Mean \pm SD	Mean \pm SD	
Anxiety/depression	6.85 \pm 4.1	7.88 \pm 4.74	0.043*
Withdrawal/depression	3.63 \pm 2.6	3.63 \pm 2.7	0.99
Somatic complaints	3.9 \pm 3.03	4.1 \pm 3.24	0.580
Social problems	4.32 \pm 3.1	4.45 \pm 3.51	0.732
Thought problems	3.68 \pm 3.19	3.29 \pm 3.34	0.302
Attention problems	4.97 \pm 3.18	4.78 \pm 3.38	0.616
Rule-breaking behaviour	4.43 \pm 3.47	3.18 \pm 3.45	0.002*
Aggressive behaviour	8.9 \pm 5.83	7.98 \pm 5.89	0.176
Internalization scale	14.38 \pm 7.86	15.61 \pm 9.08	0.206
Externalization scale	13.33 \pm 8.69	11.16 \pm 8.60	0.031*
Total scale of emotional and behavioural problems	46.16 \pm 23.79	44.46 \pm 26.09	0.554
Affective disorders	5.04 \pm 3.36	4.9 \pm 3.74	0.731
Anxiety disorders	3.33 \pm 2.23	4.22 \pm 2.47	0.001*
Somatic problems	2.39 \pm 2.18	2.54 \pm 2.23	0.557
Attention deficit and hyperactivity disorder	4.59 \pm 2.78	4.58 \pm 2.97	0.976
Oppositional defiant disorder	3.44 \pm 2.18	3.14 \pm 2.38	0.254
Conduct disorder	4.87 \pm 4.32	3.59 \pm 3.92	0.008*
Obsessive-compulsive disorder	4.37 \pm 2.72	4.26 \pm 2.92	0.735
Post-traumatic stress disorder	8.08 \pm 4.33	8.41 \pm 4.81	0.530

Legend: SD - standard deviation; * - $p<0.05$

For anxiety/depression, the mean score for boys and girls was in the non-clinical range, according to Brazilian norms. A comparison of the mean scores for anxiety/depression between the sexes indicated that boys (6.85 ± 4.1) had lower scores than girls (7.88 ± 4.74 ; $p<0.043$) did. On the scale of somatic complaints, only boys achieved scores within the clinical range.

Concerning rule-breaking behaviour, the scores of the study population were within the non-clinical range. Boys scored higher (4.43 ± 3.47) than girls (3.18 ± 3.45 ; $p<0.002$) did; however, the scores for both sexes were significantly lower ($p<0.001$) than those of the clinical range of the Brazilian norms and therefore were considered to be in the non-clinical range. The scores on the externalization scale were in the non-clinical range, and the mean scores for boys (13.33 ± 8.69) were higher than those for girls (11.16 ± 8.60 ; $p<0.031$).

For the syndrome scales, the mean scores of the study population were significantly lower ($p<0.05$) than those for the population within the clinical range of the Brazilian

norms. Comparing to the non-clinical range of the Brazilian norms, the mean scores for attention problems and rule-breaking behaviour were lower for both sexes ($p<0.05$). The mean scores on the internalization scale were lower for boys, whereas the mean scores for thought problems, aggressive behaviour, and the externalization scale were lower for girls ($p<0.05$).

On the total scale of emotional and behavioural problems, the study population did not reach the scores of the clinical range, and only girls had significantly lower ($p<0.05$) mean scores than the population within the non-clinical range of the Brazilian norms. Regarding the scores for withdrawal/depression and social problems, the study sample obtained scores within the non-clinical range, and the mean scores were similar for both sexes.

According to the Brazilian norms, the analysis of the six groups guided by the DSM-IV indicated that the scores were in the non-clinical range in both sexes. Female participants had significantly lower ($p<0.05$) scores than the non-clinical

population for affective disorders, anxiety disorders, somatic problems, attention deficit hyperactivity disorder, obsessive-compulsive disorder, and post-traumatic stress disorder. Male participants had significantly lower mean scores than the non-clinical population only for somatic problems. A comparison between the sexes indicated that girls achieved

significantly higher mean scores for anxiety disorders (boys: 3.33 ± 2.23 ; girls: 4.22 ± 2.47 ; $p < 0.001$), whereas boys achieved significantly higher mean scores for conduct disorders (boys: 4.87 ± 4.32 ; girls: 3.59 ± 3.92 , $p < 0.008$). Table 2 shows the differences in the groups for emotional and behavioural problems on the YSR scale by age group.

Table 2. Adolescent participants of the Judo Social Project: differences in the groups of emotional and behavioural problems on the YSR scale by age group

Syndrome type	Younger (N=274)	Older (N=34)	p
	Mean \pm SD	Mean \pm SD	
Anxiety/depression	7.33 \pm 4.49	6.74 \pm 3.51	0.412
Withdrawal/depression	3.67 \pm 2.63	3.35 \pm 2.70	0.505
Somatic complaints	4.12 \pm 3.15	2.85 \pm 2.52	0.024*
Social problems	4.42 \pm 3.31	4.03 \pm 2.92	0.512
Thought problems	3.55 \pm 3.32	3.32 \pm 2.72	0.698
Attention Problems	4.91 \pm 3.33	4.74 \pm 2.6	0.774
Rule-breaking behaviour	3.93 \pm 3.56	3.91 \pm 3.18	0.975
Aggressive behaviour	8.51 \pm 5.59	8.62 \pm 5.67	0.914
Internalization scale	15.12 \pm 8.52	12.94 \pm 7.01	0.153
Externalization scale	12.44 \pm 8.79	12.53 \pm 8.14	0.954
Total scale of emotional and behavioural problems	45.81 \pm 25.19	42.70 \pm 20.68	0.489
Affective disorders	5.06 \pm 3.5	4.41 \pm 3.65	0.310
Anxiety disorders	3.75 \pm 2.41	3.21 \pm 1.95	0.210
Somatic problems	2.55 \pm 2.23	1.62 \pm 1.72	0.019*
Attention deficit and hyperactivity disorder	4.62 \pm 2.85	4.32 \pm 2.57	0.559
Oppositional defiant disorder	3.28 \pm 2.25	3.65 \pm 2.44	0.371
Conduct disorder	4.42 \pm 4.26	3.76 \pm 3.69	0.388
Obsessive-compulsive disorder	4.34 \pm 2.88	4.21 \pm 2.35	0.800
Post-traumatic stress disorder	8.3 \pm 4.61	7.5 \pm 3.82	0.332

Legend: Younger - (11 to 14 years); Older - (15 to 18 years)

Among the eight syndrome scales evaluated, only somatic complaints showed a significant difference between the age groups. Younger adolescents had higher mean (4.12 ± 3.15) scores than older adolescents (2.85 ± 2.52 ; $p < 0.024$) did. On the scale of somatic complaints, younger adolescents achieved scores in the clinical range, whereas the scores of older adolescents were within the non-clinical range in relation to the Brazilian norms.

For the remaining syndrome scales, the study population reached the non-clinical range and achieved significantly lower ($p < 0.05$) scores for thought problems and attention problems than the Brazilian norms. Only older adolescents had lower mean scores ($p < 0.05$) for rule-breaking behaviour and on the total scale of emotional and behavioural problems compared to the non-clinical range Brazilian norms.

The analysis of the six groups guided by the DSM-IV indicated a significant difference only for somatic problems, and the mean scores in younger adolescents were higher (2.55 ± 2.23) than those in older adolescents (1.62 ± 1.72 ; $p < 0.019$). Compared to the Brazilian norms, younger adolescents reached the clinical range, whereas older adolescents reached the non-clinical range. For the remaining groups, the study population obtained scores within the non-clinical range with significantly lower ($p < 0.05$) mean scores for

anxiety disorders, hyperactivity attention deficit disorder, and post-traumatic stress disorder. Concerning conduct disorders, the mean scores of younger adolescents were significantly lower ($p < 0.05$) than those of the population that achieved the non-clinical range for the Brazilian norms.

In the qualitative section of the YSR scale, adolescents reported having positive relationships with their peers and engaging in sports and hobbies, particularly games. Most adolescents engaged in some activity at home (housework), and a few participants worked.

In the open answers section of the instrument regarding concerns or problems related to school, the participants recurrently reported concerns about failure in school. Furthermore, motivation and performance in the practice of judo also appeared regularly.

Discussion

Social projects that include sports activities have increased significantly in Brazil (Vianna & Lovisolo, 2009). These projects, which have a socio-educational nature, aim to meet the needs not covered by government-based health and leisure activities, particularly in socially disadvantaged areas. These projects improve mental health, eating behaviours, physical activity, self-concept, self-esteem, self-confidence,

coping mechanisms, and networking opportunities and decrease drug abuse levels (McLean & Anderson, 2009).

The greater participation of men in the Judo Social Project of São José do Rio Preto is understandable due to the form of sport offered and the traditional male hegemony in sports (Anderson, 2009a). Martial arts, in general, attracts men primarily for cultural reasons, although women have excelled in high-performance judo in recent years (Anderson, 2009b).

A predominance of participants of African descent was noted, although the population of São José do Rio Preto is predominantly Caucasian (Souza & Mourão, 2011).

Most participants achieved non-clinical scores for emotional and behavioural problems on the YSR scale. As low-income populations, both adults and children (Fleitlich & Goodman, 2000; Instituto Brasileiro de Geografia e Estatística, 2010) are considered most vulnerable to mental disorders; however, it is of note that this problem was not observed in our study population. Despite the absence of a control group in this study, the extensive literature on regular physical exercise and mental health (Chaddock-Heyman et al., 2014; Piccinelli & Wilkinson, 2000; Hinkley et al., 2014) allows us to infer that the low number of adolescents in the clinical range is associated with the protective role of physical exercise, in this case, the practise of judo. However, longitudinal studies are needed to corroborate this assumption.

A comparison of emotional and behavioural problems between the sexes indicated the prevalence of anxiety and depression in female participants and rule-breaking behaviour in male participants.

McLean and Anderson (2009) reported that girls are more likely than boys to develop anxiety disorders, with greater vulnerability in infancy and an increased likelihood of being currently diagnosed or having a lifelong diagnosis. By the age of six years, girls have a two-fold higher probability of developing anxiety disorders than boys, and this difference seems to persist during adolescence. Female adolescents reported a greater number of concerns and greater anxiety about divorce; female adolescents also have a six-fold increased likelihood of developing generalized anxiety disorder compared to boys (McLean & Anderson, 2009).

In the study population, the prevalence of depressive disorders among girls was consistent with epidemiological results, which indicated a higher prevalence, incidence, and risk of morbidity from depressive disorders in women (Piccinelli & Wilkinson, 2000). Studies also show a higher prevalence of depression and anxiety symptoms in young female athletes when compared to men (Junge & Feddermann-Demont, 2016). It should also be noted that the prevalence of depression and anxiety disorders in young athletes is similar to the female population in general (Junge & Prinz, 2018).

The predominance of behaviours that involve rule-breaking among male participants was similar to the results of previous studies. Evidence indicates that specific characteristics of male participants are associated with overt aggression and disruptive behaviour disorders and a higher incidence of disciplinary and behavioural problems in school. Low socioeconomic status and family and school characteristics are relevant variables associated with the early onset of conduct disorders in vulnerable children (Baptista et al., 2001; Strauss, Rodzilsky, Burack, & Colin, 2001). Mallia, Lucidi, Zelli, Chirico, and Hagger (2019), when researching the re-

lationships between socio-contextual, motivational factors, attitudes of young male athletes, concerning prosocial and antisocial behaviours and their real rules violations, from team modalities during the matches, concluded that the promotion of autonomous motivation and the satisfaction of needs through support for autonomy could promote attitudes towards prosocial behaviours and minimize rule violations in young athletes.

The somatic problems identified in the study population, with higher frequency in younger children than in older children, were also reported in the DSM-IV. In the case of depression, children may display an irritable mood rather than a depressed mood. In addition, younger children are more likely than older children to express somatic complaints, irritability, and social withdrawal (IBGE, 2010).

Social projects are usually offered in communities with greater vulnerability to behavioural problems due to economic disadvantages and other characteristics, including the presence of single-parent families (Baptista et al., 2001; Fleitlich & Goodman, 2000). In this context, physical exercise and inclusion in social programmes can improve social support, strengthen protective factors, and reduce stress and risk factors (Masi et al., 2008).

The limitations of this study include the need to longitudinally collect data from project participants (participants, family, and teachers) and to collect data from several informants about the overall status of children who participated in the evaluated judo programme.

The difference between the language of the instrument and the capacity of the participants to understand and interpret this tool made the application more arduous.

The validation of the instrument for the Brazilian population does not specify differences between practitioners and non-practitioners of physical exercises or differences in the characteristics of sports in their multiple contexts. Therefore, in this study, we could not infer whether the differences in the scores between the study population and the Brazilian norms were correlated with the practice of physical exercises.

Identifying behavioural problems such as anxiety disorders, depressive symptoms, conduct disorders, rule-breaking behaviour, and somatic complaints are critical areas of clinical research. The early identification of these problems and their manifestations in both sexes can improve diagnosis and prognosis and promote the development of preventive interventions to improve the outcomes in vulnerable populations during their transition to adulthood (Strauss et al., 2001).

Therefore, the services offered in social projects that are focused on sports should be organized in such a manner as to allow easier access of vulnerable social groups to these preventive and therapeutic programmes (Strauss et al., 2001).

The percentage of study participants with scores within the clinical range was lower than that found for the Brazilian population. A comparison between the sexes indicated that internalization symptoms (anxiety and depression) were more frequent among female participants, whereas externalization symptoms (rule-breaking behaviour and conduct problems) were more prevalent among male participants. Furthermore, younger children had more somatic problems and complaints than older children did.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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