

Research article

REGULAR EXTRA CURRICULAR SPORTS PRACTICE DOES NOT PREVENT MODERATE OR SEVERE VARIATIONS IN SELF-ESTEEM OR TRAIT ANXIETY IN EARLY ADOLESCENTS

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ABSTRACT

Physical activity is often presented as an effective tool to improve self-esteem and/or to reduce anxiety. The aim of this study was to measure the influence of a regular extra curricular sports practice on self-esteem and anxiety. We conducted a prospective cohort study, which has included all of the pupils entering the first year of secondary school (sixth grade) in the Vosges Department (east France) during the school year 2001-2002 and followed during three years. Data were collected every six months by self-reported questionnaires. 1791 pupils were present at each of the six data collection sessions and completed all the questionnaires, representing 10,746 documents: 835 boys (46.6 %) and 956 girls (53.4 %), in November 2001, the average age was 11.1 ± 0.5 years (mean \pm standard deviation). 722 pupils (40.3 %) reported that they had practiced an extra-school physical activity in a sporting association from November 2001 to May 2004 (ECS group), whereas, 195 (10.9 %) pupils had not practiced any extra-school physical activity at all (NECS group). The average global scores of self-esteem (Rosenberg's Scale) and trait anxiety (Spielberger's Scale) of the ECS pupils were, respectively, higher and lower than those of the NECS group. However, the incidence density (number of new cases during a given period / total person-time of observation) of moderate or severe decrease of self-esteem (less than "mean - one standard deviation" or less than "mean - two standard deviations") was not significantly different between the two groups, a finding that was also evident also in the case of trait anxiety. Finally, among ECS pupils, the incidence density of severe decrease of self-esteem was lower at the girls'. Practitioners and physical education teachers, as well as parents, should be encouraged to seek out ways to involve pupils in extra-school physical activities.

KEY WORDS: Adolescents, self-esteem, trait anxiety, extra-curricular sport practice.

INTRODUCTION

The practice of a regular physical activity induces benefits for health. These benefits are not only physiological but are also psychological. In particular, physical training results in increased self-esteem and perceived physical competence (Demarco et al., 1989; Sonstroem, 1984), especially when self-esteem is initially low (McAuley, 1994), and in reduced anxiety level (Landers and

Petruzzello, 1994; Carmack et al., 1999; Katula et al., 1999; Landers and Petruzzello, 1994).

Self-esteem can be defined as a positive or negative orientation toward oneself, an overall evaluation of one's worth or value (Rosenberg, 1979). Self-esteem is never definitive and may vary from a situation to another, from a meeting to another, according to problems to be solved or choices to be made (Tap et al, 2002). This factor is assumed to be responsive to enhancing interventions

(Robson, 1988). To define anxiety, a distinction between state and trait has become commonplace. State anxiety is defined by an unpleasant emotional arousal in face of threatening demands or dangers. On the other hand, trait anxiety is independent of specific situations and reflects the existence of individual differences in the tendency to respond with state anxiety in the anticipation of threatening situations (Spielberger, 1983). It is primarily through experiences that some individuals acquire low or high trait anxiety and persons who are high in trait anxiety tend to be anxious in many situations. This factor is considered to be relatively stable but it may increase, even if modestly, in some cases (Norris et al., 1988).

Self-esteem and trait anxiety vary during adolescence. There is a gradually but significant decrease of girls' (Basow and Rubin, 1999; Gilligan, 1990) and boys' (Eccles et al., 1989; Wigfield et al., 1991) self-esteem, as well as an increase of trait anxiety (Canals et al., 1992). These variations begin after the transition to secondary school as pupils adjust to the school change (Wigfield et al., 1991).

Low self-esteem and/or high trait anxiety are potentially linked to risk behaviours, such as substance abuse (alcohol, cannabis, and other drugs), risky sexual behaviour, suicidal ideation and attempts, dieting and other extreme weight control methods (Laure et al., 2005; McGee and Williams, 2000; Wasson and Anderson, 1995; Wild et al., 2004a). This is proposed to be the reason why, for a long time, the aim of numerous prevention programs among adolescents is to improve their self-esteem and/or to enable them to cope with mental stress.

To achieve these objectives, physical activity is often presented as an effective tool (Ekeland et al., 2005; Gruber, 1986), notably because compared to sedentary peers, young athletes usually show a higher self-esteem and a lower trait anxiety (Calfas and Talor, 1994; Crews et al., 2004; Jaffee and Manzer, 1992; Koivula, 1999; Strauss et al., 2001; Taylor, 1995). In particular, participation in extracurricular sports has been linked to higher self-esteem (Duda, 1989; Holland and Andre, 1994; Jaffee and Ricker, 1993), even if the underlying mechanisms, which entail this fact, remain unclear.

The theoretical basis for the relationship between sports and self-esteem or anxiety is found in other areas than sport psychology. For instance, the theoretical models and measurement scales of these two variables were developed in psychology, education, and mental health. However, subsequently, their applicability to other fields, notably sports, has been widely tested (Boyd and Hrycaiko, 1997).

According to Ekeland et al. (2005), the beneficial effects of sports on self-esteem and anxiety were mainly revealed by small and low quality trials. Moreover, to our knowledge, little is known about the potentially "protective impact" of physical exercise. In other words, does a regular physical activity practice help to limit problematic variations of self-esteem levels (decrease) and trait anxiety (increase)?

The aims of this work, conducted among a large sample of 11 year old adolescents followed up during a three year period, are 1) to compare self-esteem and trait anxiety levels between adolescents who are engaged in a regular extra curricular sports (ECS) practice and those who are not, and 2) to measure whether, or not, a regular ECS practice may help to maintain levels of self-esteem and avoid increases in trait anxiety.

This study results from the "Cohorte Myrtilles", financed by the French ministry of Youth and Sports and by the regional health program "Fight against drug dependence in the Lorraine region (France)".

METHODS

Participants

Participants have taken part in a prospective cohort study, namely "Cohorte Myrtilles", which included all of the pupils entering the first year of secondary school (sixth grade) in the Vosges department (Lorraine region, east France) during the school year 2001-2002 and followed for four years. The data presented in this paper results from a three year follow up period (follow-up began on November 2001 and continued to May 2004). Only the voluntary pupils were included in the study (Nov 2001: $n = 3323$). From November 2001 to May 2004, more than 18,900 completed questionnaires were returned.

Overall, 1791 pupils were present at each of the six data collection sessions and completed all the questionnaires, representing 10 746 documents. 1532 pupils missed at least one session (illness, change of school, etc) and therefore, they were not included in the study.

The responding pupils were composed of 835 boys (46.6 %) and 956 girls (53.4 %). In November 2001, the average age was 11.1 ± 0.5 years (mean \pm standard deviation). There is no data available on the ethnicity status of the participants.

The distribution of the parents' social and occupational groups was similar to the one that is generally found in the Vosges department.

Table 1. Half-yearly variations of global scores in self-esteem (measured by Rosenberg's Scale) and trait anxiety (Spielberger's Scale). Comparison between extra curricular sports (ECS) practice and no extra curricular sports (NECS) practice (mean age 11 years in Nov 01). Data are means (\pm SD).

| | Nov 01 | May 02 | Nov 02 | May 03 | Nov 03 | May 04 |
|-------------------------------|------------|-------------|-------------|-------------|-------------|-------------|
| Score of self-esteem | | | | | | |
| ECS | 31.5 (4.7) | 32.5 (4.6) | 31.1 (4.2) | 32.8 (5.6) | 32.8 (5.6) | 32.3 (6.0) |
| NECS | 29.5 (4.6) | 30.8 (4.7) | 29.4 (4.4) | 30.8 (5.6) | 31.0 (6.1) | 30.8 (6.0) |
| F values | 30.8 *** | 26.0 *** | 26.9 *** | 23.2 *** | 20.4 *** | 10.7 *** |
| Score of trait anxiety | | | | | | |
| ECS | 38.9 (9.6) | 35.7 (9.6) | 36.1 (10.5) | 36.3 (11.3) | 36.9 (11.1) | 37.3 (11.7) |
| NECS | 42.1 (9.6) | 38.4 (10.3) | 39.3 (10.8) | 39.9 (11.1) | 38.8 (11.0) | 39.9 (11.5) |
| F values | 20.0 *** | 17.4 *** | 17.0 *** | 15.4 *** | 6.5 ** | 9.7 ** |

** $p < 0.01$, *** $p < 0.001$.

Data collection

Data were collected every six months by self-reported questionnaires, designed with an easy answer format. They were administered by school physicians, school nurses or school social workers and completed individually at school. Pupils indicated their number of anonymity, and placed the questionnaire in an envelope, which was sealed at once. Confidentiality and anonymity was assured for the respondents. They were solicited to give honest answers. In the present study, we included subjects who supplied complete questionnaire data and who participated at each of the six data collection sessions.

Questionnaire

The questionnaire, of semi-structured type, was tested beforehand on 120 pupils to ensure the questions were understood and the obtained responses were as accurate as possible (answers obtained by the questionnaire were compared with those collected by interview).

The final document contained the usual socio-demographic items and included an evaluation of:

- *The school and extra-school sports practice (nature and volume schedule);*
- *Self-esteem (SE), measured by Rosenberg's (1979) Self-esteem Scale;*
- *Trait anxiety (AT), measured by Spielberger's (1983) State-Trait Anxiety Inventory. State anxiety was not retained, because this variable is too dependent on the situation. Trait anxiety, more stable over the course of time, is the most commonly used indicator.*

Statistical analysis

The data were managed and analysed using the Modalisa® 4,6 (Kynos, Paris) survey processing software (data entry verified by two operators). According to the nature of the variable, comparisons were made by the chi-square test or by ANOVA, on

series paired by pupil. The significant threshold employed was $p < 0.05$.

Subjects' welfare

The study received the approval of the Inspection of Academy of Vosges (ethical approval is not required in France for anonymous self-completed questionnaire surveys, but we followed the French bioethics law, a text which is comparable to the APA Ethics Code). Each headmaster, duly informed by mail, had the choice to participate or not (three of them declined participation in the study). A letter of information was sent to the parents, who could refuse the participation of their child.

According to French law, our computerized files of data were authorized by the CNIL (National Committee of Data-Processing and Liberty).

RESULTS

Sports practice

On the whole, 722 pupils (40.3 %) stated that they had practiced an extra-school physical activity in a sporting association from November 2001 to May 2004 ("Extra curricular sports practice group, ECS"). On the contrary, 195 (10.9 %) told us that they had not practiced any extra-school physical activity at all during this period ("No extra curricular sports group, NECS"). The rest of the sample (48.8 %) had only an occasional extra-school physical activity (they were not approached in this work).

The ECS adolescents stated that they had done 3.5 hours per week of extra-curricular sport as they entered the secondary school (Nov. 2001) and 4.8 hours per week three years later (May 2004) ($F = 1.32$, $p < 0.05$).

According to the boys, their most practiced five sports were soccer, tennis, judo, basketball and table tennis. Besides dance, girls practiced especially horse riding, gymnastics, swimming, athletics and tennis.

Table 2. Incidence density of decrease in self-esteem and increase in trait anxiety between Nov 01 and May 04. Comparison between extra curricular sports (ECS) practice and no extra curricular sports (NECS) practice (mean age 11 years in Nov 01).

| | | ECS | NECS | Chi ² values |
|--|-------------------------|-------|-------|-------------------------|
| Incidence density of decrease in self-esteem | Moderate: < mean – 1 SD | 129.0 | 124.1 | .24 |
| | Severe: < mean – 2 SD | 25.1 | 16.2 | 1.60 |
| Incidence density of increase in trait anxiety | Moderate: > mean + 1 SD | 105.6 | 129.0 | .25 |
| | Severe: > mean + 2 SD | 16.3 | 18.3 | .15 |

SD = standard deviation.

Among the ECS participants, the average rate of withdrawal of a sport for the benefit of another one was 23 % (this ratio was calculated as follow: number of withdrawal / sum of ECS pupils). There were no differences according to gender (Chi² = 1.01).

Self-esteem, trait anxiety

The average global scores of self-esteem and trait anxiety of the ECS pupils were, respectively, higher and lower than those of the NECS group (Table 1).

To describe the evolution of these scores, we have used the incidence density (number of new cases during a given period/total person-time of observation), which is one of the most common variables in the field of public health. The incidence density of moderate or severe decrease of self-esteem (less than “mean – one standard deviation” or less than “mean – two standard deviation”) was not significantly different between the two groups (Table 2). The incidence density of moderate or severe increase of trait anxiety (more than “mean + one standard deviation” or more than “mean + two standard deviation”) was not different either.

Finally, among ECS pupils, the incidence density of severe decrease of self-esteem was lower in the girls (Table 3). We did not notice any significant difference of the incidence density, neither of decrease of self-esteem, nor of increase of trait anxiety, between subjects who changed their sports and subjects who always practiced the same sport during the follow-up period.

DISCUSSION

This study has its limits. Firstly, data were collected

on a declarative mode. While this is common method, the investigators do not have the possibility to check the answers. On the other hand, this technique does not seem to disrupt excessively the validity of results even though it seems delicate to generalise them (Pate, 1993). Secondly, we have measured only global self-esteem and not its constituents: physical, social, and intellectual (Shavelson et al., 1986), or other more specific variables enrolled in the construction of teenagers' self-esteem, such as academic performance, physical appearance or athletic competence (Harter, 1993). This is due to the fact that « Cohorte Myrtilles » was a prospective study related to adolescents' drug use and abuse, and in this context, we felt more relevant to assess global self-esteem rather than a specific aspect of self-esteem (e.g. physical self-esteem).

Our study highlights an interesting finding: adolescents who engaged in a regular extra curricular sports practice had greater global self-esteem and lower trait anxiety than adolescents who did not engage in these activities. However, the link of causality between sports and self-esteem remains to be established: some studies show that physical exercise can improve self esteem in children and young people (Ekeland et al., 2005), whereas some others suggest that individuals with high self-esteem may be more likely to engage in exercise regularly (Fontane, 1996). There is probably a reciprocal influence of these two factors. In any case, these results are supported by a recent paper which emphasized that extra curricular activities are different than many other school activities because of the opportunities they provide to develop social and leadership skills, increase peer-awareness, and improve emotional fitness (Dworkin et al., 2003).

Table 3. Incidence density of variation in self-esteem and trait anxiety between Nov 01 and May 04 among extra curricular sports practice group. Comparison by gender.

| | | Girls | Boys | Chi ² values |
|--|-------------------------|-------|-------|-------------------------|
| Incidence density of decrease in self-esteem | Moderate: < mean – 1 SD | 91.1 | 138.2 | 0.31 |
| | Severe: < mean – 2 SD | 10.1 | 24.5 | 7.20 *** |
| Incidence density of increase in trait anxiety | Moderate: > mean + 1 SD | 130.0 | 184.7 | 0.62 |
| | Severe: > mean + 2 SD | 15.4 | 17.3 | 0.09 |

*** p < 0.001. SD = standard deviation.

Our second result is more disappointing, as we have found no “protective impact” of an extra-school physical activity over a period of 3 years: the ECS group showed as much moderate or severe variation of self-esteem or trait anxiety as the NECS group. Considering that self-esteem and trait anxiety certainly do not only depend on sports practice, but also on the adolescents’ social, school, and family life (Wild et al., 2004b), several hypothesis contribute to explain this result:

- 1) *The “protective impact” could be masked by the multiplicity and the heterogeneousness of practices in our population (more than 55 declared sports).*
- 2) *Three years of follow-up could be insufficient to show a “protective impact” of physical activity. Indeed, our pupils are young, positioned between childhood and adolescence. So the variations of self-esteem and trait anxiety could be more different to show and to connect with a particular behaviour such as sport practice (Lameiras Fernandez and Rodriguez Castro, 2003).*
- 3) *It is possible that the investigated “protective impact” does not exist.*

Nevertheless, we have found another interesting result: among young physically active pupils, girls have shown a less severe decrease in self-esteem than boys over 3 years. This result could be explained by the nature of the activities practiced by girls, maybe less centred on performance and competitive spirit, and more on “sensations”, such as those obtained from dance or horse riding, joyful and supportive camaraderie.

CONCLUSIONS

Our work shows that a regular extra-curricular sports practice is associated to better levels of self-esteem and trait anxiety among young adolescent and this activity seems to protect from severe variations of self-esteem in girls. Practitioners and physical education teachers as well as parents, should be encouraged to seek out ways to involve pupils in physical activities, in particular girls, who, traditionally, are not encouraged to pursue a physically active lifestyle.

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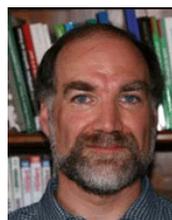
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KEY POINTS

- A regular extra-curricular sports practice is associated to better levels of self-esteem and trait anxiety among young adolescent.
- This activity seems to protect girls from severe variations of self-esteem.
- Boys do not seem to be protected from moderate or severe variations, neither of self-esteem, nor of trait anxiety, by a regular extracurricular sport practice.

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