Effects of playing multiple sports on sport life, and basic lifestyle among elementary school children

○ T. Nakano (Chukyo University: taka@sass.chukyo-u.ac.jp), A. Goto (Chukyo Unovbersity), K. Kasuga (Gifu University), T. Sakai (Nagoya Gakuin University), K. Oguri (Gifu Shotoku Gakuen University), FACSM, K. Tanaka(University of Tsukuba)

1. Background and Purpose

The Sports Agency in Japan is promoting the reform of sports club activities in schools. It recommends that sports clubs must maintain their educational significance, promote playing multiple sports, and encourage local residents to become leaders. Under these circumstances, Nagoya City has reformed its elementary school club activities. This reform may be very effective from the perspective of growth and development. Therefore, we examined the outcomes of the reform with the cooperation of the city. Specifically, we focused on playing multiple sports. Japanese children tend to play a single sport; however, in recent years, the importance of experiencing multiple sports during childhood has been reaffirmed. Therefore

This study focused on multiple sports activities and examined their effects on increasing the duration of playing sports and promoting healthy lifestyles.

3. Methods (Subjects, Data collect, Measurement items, Analysis procedures)

【Subjects】

A questionnaire survey was conducted among 3,446 fourth- to sixth-grade children, and data from 2,159 children who consented to participate in this study and completed all items were analyzed.

Table 1. Number of Subjects

Gender	Grade			Total
	grade 4	grade 5	grade 6	
Boys	390	358	354	1102
Girls	360	367	330	1057
Total	750	725	684	2159

【Data collection】

The Board of Education distributed the questionnaire to each school. Subsequently, the classroom teachers distributed the questionnaire to the children, and the guardians and children answered the questions jointly at home. As a rule, guardians filled out the answers. After answering all questions, the questionnaire was submitted to the classroom teacher in a sealed envelope. An explanatory document regarding the study was attached at the beginning of the questionnaire, and informed consent was obtained from all participants.

【Analysis items】

A questionnaire comprising nine domains was developed. We analyzed items related to participation in club activities, sports preferences, sports life, sleeping and study habits, and use of screen media.

Analysis domains and items

Participation in club activities
1. Do you participate in school club activities? (Yes/No)
2. How many sports do you play in school clubs? (3 is max)

Sports preferences
1. Do you like sports? (4-point Likert scale)
2. Are you good at sports? (4-point Likert scale)

Duration of playing sports and physical fitness
1. How many minutes a day on average do you play sports/exercise? (Weekdays and weekends)
2. Please self-assess your physical fitness. (5-point Likert scale)

Daily life-time: sleeping and study
1. What time do you go to bed? (weekday)
2. How many hours a day do you study? (weekday)

Use of screen media
1. How many minutes a day do you play TV games?
2. How many minutes a day do you use your smartphone? (Weekdays and weekends)

【Analysis procedures】

Relationship between the number of sports played in school clubs and sports preferences.
- Differences in liked/disliked sports and being good/poor at sports based on the number of sports played in school clubs. ⇒ Cross tabulation & chis-square test

Step 2: Relationship between the number of sports played in school clubs and duration of playing sports and physical fitness.
- Differences in time spent playing sports based on the number of sports played in school clubs. ⇒ One-way ANOVA
- Differences in self-assessed physical fitness based on the number of sports played in school clubs. ⇒ Cross tabulation & χ^2 test

Step 3: Relationship between the number of sports played in school clubs and bedtime and study time.
- Differences in bedtime based on the number of sports played in school clubs.
- Differences in study time based on the number of sports played in school clubs. ⇒ Cross tabulation & χ^2 test, Three-way ANOVA

Step 4: Relationship between the number of sports played in school clubs and the use of screen media.
- Differences in game-playing time and smartphone usage time based on the number of sports played in school clubs. ⇒ Three-way ANOVA

2. Summary of results

☆ Relationship between the number of sports played in school clubs and sports preference

Children who played multiple sports were significantly more likely to indicate that they liked and were good at sports. Although a causal relationship could not be established, these results suggest that playing multiple sports positively affects exercise preferences and skills.

☆ Relationship between the number of sports played in school clubs and sports time and physical fitness

Children who played multiple sports spent significantly more time playing sports. Additionally, children who played multiple sports exhibited significantly better self-assessed physical fitness. Thus, playing multiple sports appears to be effective in increasing the duration of playing sports and positively affects self-confidence in physical fitness.

☆ Relationship between the number of sports played in school clubs and bedtime and study time

Bedtime was earlier as the number of sports played increased. Particularly, it was significantly later for children who did not play any sports. Study time decreased as the number of sports played increased. Particularly, it was significantly longer for children who did not participate in any sports. Thus, playing multiple sports positively affects bedtime, but balancing study and sports remains a challenge.

☆ Relationship between the number of sports played in school clubs and use of screen media

Game-playing time was significantly longer for boys, and smartphone usage time was significantly longer for older students. However, no significant relationships were found between playing multiple sports and game-playing and smartphone usage times.

4. Results

Result I: Relationship between the number of sports played in school clubs and sports preferences

Figures 1 and 2 illustrate the differences in the ratios of liked/dislike sports and being good/poor at sports, respectively, based on the number of sports played in school clubs.

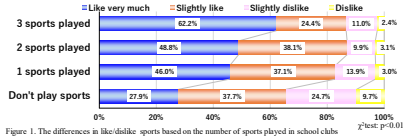

Figure 1. The differences in like/dislike sports based on the number of sports played in school clubs

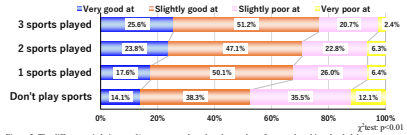

Figure 2. The differences in being good/poor at sports based on the number of sports played in school clubs

Children who played multiple sports were significantly more likely to indicate that they liked and were good at sports. Although a causal relationship could not be established, these results suggest that playing multiple sports positively affects exercise preferences and skills.

Result II: Relationship between the number of sports played in school clubs and duration of playing sports and physical fitness

Figures 3 shows the difference in the time spent playing sports (weekdays/weekends) based on the number of sports played in school clubs.
Figures 4 shows the differences in the ratio of self-assessed physical fitness based on the number of sports in school clubs

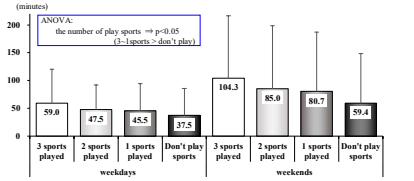

Figure 3. The differences in time spent playing sports based on the number of sports in school clubs

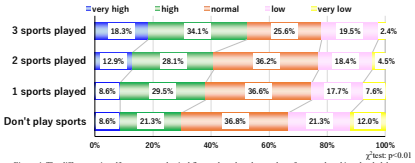

Figure 4. The differences in self-assessment physical fitness based on the number of sports played in school clubs

Children who played multiple sports spent significantly more time playing sports. Additionally, children who played multiple sports exhibited significantly better self-assessed physical fitness.
Thus, playing multiple sports appears to be effective in increasing the duration of playing sports and positively affects self-confidence in physical fitness.

Results III: Relationship between the number of sports played in school clubs and bedtime and study time

As the main effect of grade was confirmed for bedtime and study time, differences based on the number of sports played in school clubs were observed for each grade (Figures 5 and 6).

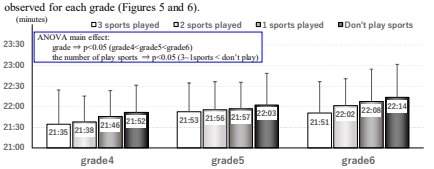

Figure 5. The differences in bedtime based on the number of sports played in school clubs

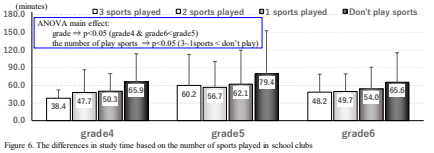

Figure 6. The differences in study time based on the number of sports played in school clubs

The main effects of grade on bedtime and study time were confirmed, indicating significant differences between grades.
Bedtime was earlier as the number of sports played increased. Particularly, it was significantly later for children who did not play any sports. Study time decreased as the number of sports played increased. Particularly, it was significantly longer for children who did not participate in any sports. Thus, playing multiple sports positively affects bedtime, but balancing study and sports remains a challenge.

Results IV: Relationship between the number of sports played in school clubs and the use of screen media

As the main effect of sex was confirmed for game-playing time, differences based on the number of sports played in school clubs were observed for each sex. As the main effect of grade was confirmed for smartphone usage time, differences based on the number of sports played in school clubs were observed for each grade (Figures 7 and 8).

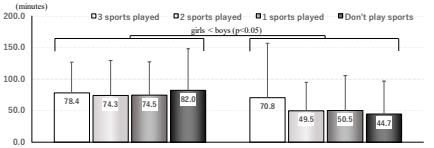

Figure 7. The differences in TV game playing time based on the number of sports played in school clubs

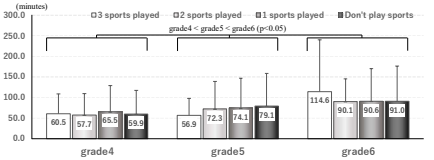

Figure 8. The differences in smartphone usage time based on the number of sports played in school clubs

Game-playing time was significantly longer for boys, and smartphone usage time was significantly longer for older students.
However, no significant relationships were found between playing multiple sports and game-playing and smartphone usage times.