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Article

# Sports Club Membership in Children. Gender Differences, Consequences through the COVID-19 Pandemic, and Implications for Future Promotion Strategies

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**Abstract:** The COVID-19 pandemic globally had worrisome effects on health-promoting behaviors of children. Currently, the impact on primary school children's membership in sports clubs, especially considering gender differences, is poorly studied. The main objective of this study was to analyze the status of sports club memberships among children in Austria after the stringent COVID-19 restrictions in June 2021 and to identify gender differences. 755 Austrian school children (mean age 9.9 years, 49.9% girls) were interviewed about their sports club memberships. Our results show significantly lower self-reported sports club membership in June 2021 compared to pre-pandemic studies. 50% of boys reported being a member of a sports club, while the percentage for girls was only at 29.7% ( $p < 0.001$ ). Besides, a significant gender difference in the type of sports club membership was observed with most boys being members of ball sports clubs, while girls were more likely to be members of other sports clubs ( $p < 0.001$ ). Reduced rates of sports club membership after the COVID-19 pandemic underline the need of intervention programs. Health authorities, schools, sports clubs and families should form an alliance to promote an overall increase of physical activity and thus to support the long-term healthy development of children.

**Keywords:** sports club membership; primary school; children; physical activity; health

## 1. Introduction

In late 2019, when the COVID-19 pandemic began spreading globally from Wuhan, China, heavy restrictions were enforced on public places all over the world to mitigate the spread of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1].

Children and adolescents were particularly affected by the restrictions due to school closures and severely limited sports and leisure opportunities [2,3]. This greatly reduced physical activity levels [3–10] led to lifestyle changes such as increased screen time [5–7,9,10] and sedentary behavior during leisure time [2,8], changes in eating habits [5–7,11], and shifted sleep times [5–7,12]. Children from socially underprivileged households were most affected by the stringent restrictions, as they are dependent on public assistance in many ways [13]. These changes may have significant negative long-term consequences on many health related fitness parameters [14].

In general, sports are considered to be extremely beneficial for physical health, social well-being and other areas of life [15]. Furthermore, membership in a sports club has positive effects through its social structure, the shared norms and values, and the commitment to fairness and respect [16,17]. In the long run, membership in a sports club and active participation in sports activities positively affect physical, mental and social well-being and thus contribute to an overall increase in the quality of life [18–22]. This holds true both for ball sports as well as other sports [23].

In school-aged children and adolescents, physical activity is associated with numerous health benefits [24–26]. The high number of children who are not active in a sports club represent a

significant challenge, especially in the eastern part of Europe, where significantly fewer children are involved in sports clubs compared to the western part [27]. Internationally, countries such as Denmark, Italy, Ireland, and Latvia have high rates of >75% of 8-year-old children in sports clubs, indicating a strong cultural emphasis on sports participation and broad availability of sports opportunities [27]. In general, rates are higher for boys than girls [23,27,28].

The aim of this investigation was to examine gender differences in sports club membership among 10-year-old primary school children in an Austrian community after the COVID-19-related stringent lockdowns.

## 2. Materials and Methods

This study was part of a randomized controlled trial to investigate the effects of a physical education intervention on the fitness and health status of primary school children in Klagenfurt, Austria. Measurements were performed between September 2019 and June 2022, and a series of research reports have been published previously [29–32]. In this paper, thus far unpublished data focusing sports club membership are presented. In June 2021, all children participating in the study were asked in detail about their sports club membership. The questions were answered verbally by the children themselves and documented in writing by the test leader. The study was approved by the Research Ethics Committee of the University of Graz, Styria, Austria (GZ. 39/23/63 ex 2018/19).

### Participants

A list of all 39 primary schools in the greater Klagenfurt area, Austria, was used to select the schools. Using a random number generator, 12 schools were selected, all schools agreed to participate in the study. 1013 children aged 7-10 years attending these 12 schools were invited to participate, and legal guardians of 860 (85%) children provided written consent for their children's participation.

In June 2021, finally 757 children participated and answered questions about their sports club membership.

### Outcomes

The primary outcomes for this study were self-reported differences concerning sports club memberships in third- and fourth-grade primary school boys and girls after termination of the stringent COVID-19 related restrictions.

#### *Subjective measurements / data - Self-reported sports club membership*

The children were asked whether they had an active membership in a sports club in June 2021. If this question was answered by "no," the answer was documented by the test leader and the children were not further interviewed. If this question was answered by "yes," this answer was documented by the test leader and the children were asked two more questions.

First, the children could choose whether their sports club was a ball sports club or a sports club not related to ball sports. If the children were not sure about the type of their sports club, this was clarified by the test leader asking specific questions. If the children reported membership of more than one sports club, they were asked which of them they preferred most.

All answers given by the children were documented by the test leader.

If the children indicated a (preferred) sports membership in a ball sports club, they were asked to specify whether it was a soccer, tennis, basketball, handball or other ball sports (e.g. table tennis, golf, bowling, etc.). If the children declared to be members of a sports club without ball sports-specific training, they could choose among gymnastics, athletics, swimming or ice hockey. If the sports club could not be categorized as one of the above mentioned (e.g. figure skating, horse riding, circus gymnastics etc.) the answer was documented under the category "Other sports club" (Figure 1).

#### *Objective measurements / data - Anthropometrics*

Anthropometric data included height (cm) and weight (kg). The children's height was measured to the nearest 0.1 cm using a portable stadiometer (SECA 213, Hamburg, Germany). Weight was

measured to the nearest 0.1 kg using an electronic scale (BOSCH PPW4202/01, Nuremberg, Germany). BMI was calculated by dividing weight in kilograms by height in meters squared.

National reference values were used for BMI standardization and weight classification. Absolute BMI values were converted to EQUI-BMI values (referred to as EQUI BMIAUT in this paper) using the procedure described by Mayer et al. [33] (based on Cole et al. [34]).

### **Statistical Analysis**

Descriptive statistics were calculated. Continuous variables are presented as the mean (M) and standard deviation (SD) and categorical variables as absolute values (No.) and percentages (%). No imputation of data was performed.

An unpaired t-test was performed to test for differences of means between boys and girls. Chi-square test ( $\chi^2$ ) was used to test for differences in percentages between boys and girls, if expected cell frequencies were at least 5. For Cross Tables with cell values less than 5, a Monte Carlo simulation with 1000 repetitions was calculated to get an unbiased estimate of the exact level of significance. To be able to calculate the p values of the post hoc tests, the corrected residuals were calculated for the cross-tabulations. Bonferroni-Holm correction was used for post hoc tests.

Phi ( $\phi$ ) (for 2x2 tables) and Cramer's (V) (for 2x(>2)tables) according to Cohen [35] were calculated to estimate the effect size between genders.

The strength of these correlations was classified according to Cohen [35] (effect size:  $\geq 0.1$ , small;  $\geq 0.3$ , medium; and  $\geq 0.5$ , large).

All tests were two-tailed, with a p-value  $< 0.05$  considered statistically significant. All statistical calculations were performed with SPSS version 29 (IBM Corp. Released 2022. IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp).

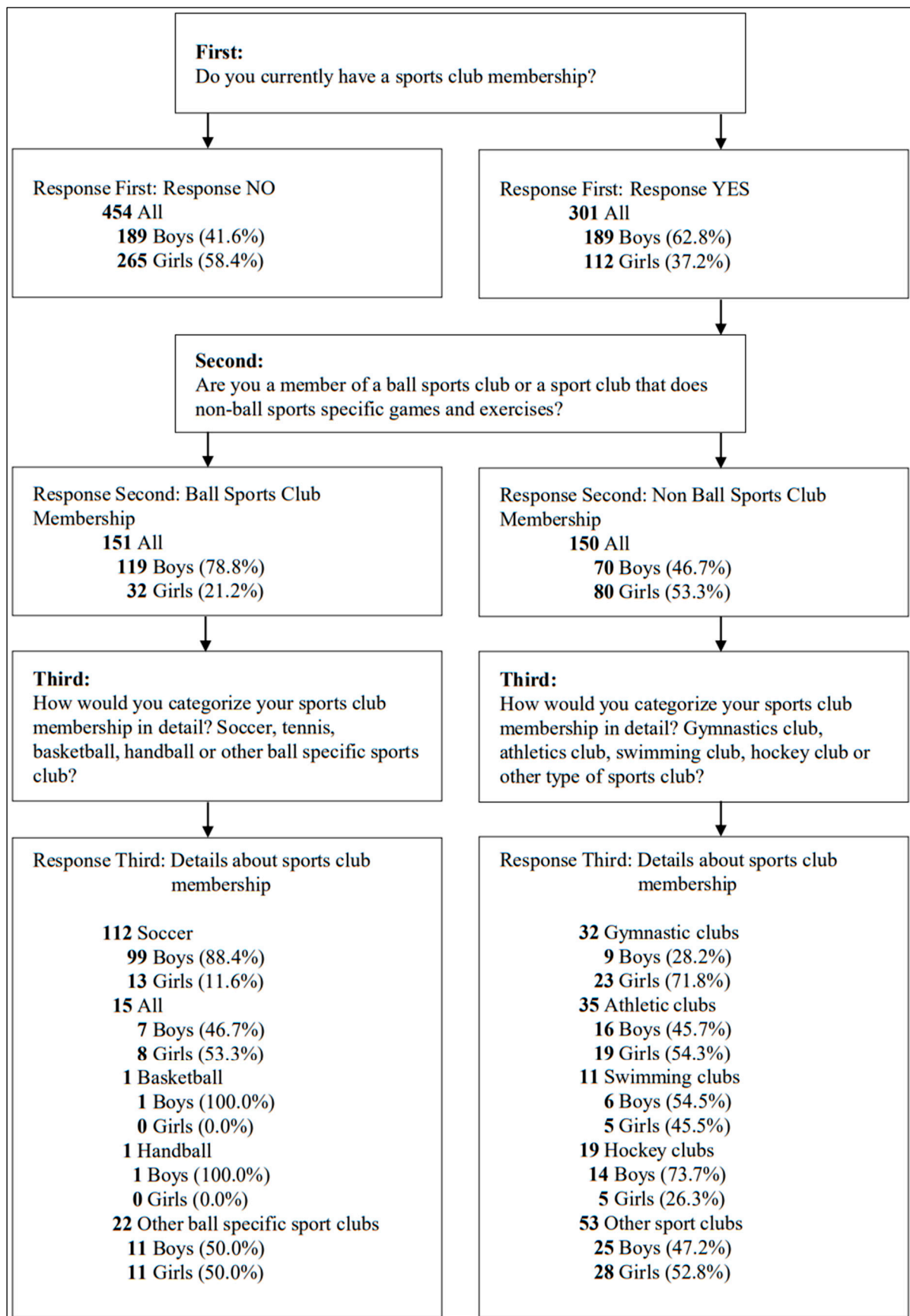


Figure 1. Questionnaire sports club membership.

### 3. Results

755 children were included in the analyses, the mean age was  $9.9 \pm 0.7$  years (range 8.5–11.7 years). 377 (49.9%) were girls, and 301 (39.9%) children were member of a sports club (Table 1). The answer options “basketball” and “handball” were chosen once each (both times by boys). Due to the low number, these two answer options/groups were merged with the group “Other ball sports club” and subsequently only three different groups of ball sports club membership (soccer, tennis, other ball sports club) were used for analyses.

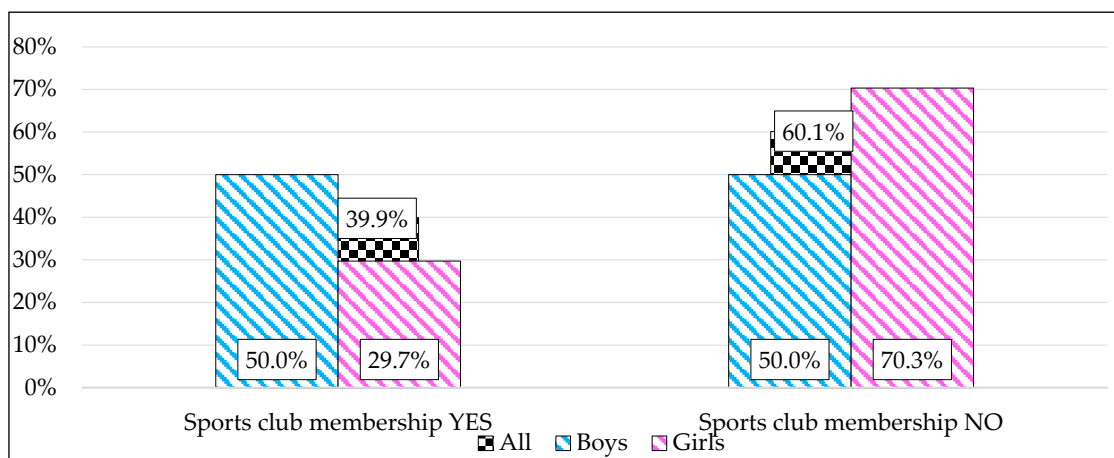
**Table 1.** Study characteristics - descriptive statistics of raw scores and standard deviation scores (SDS).

Variable	All	Boys	Girls	$X^2_a$	t	P value	Phi ( $\phi$ )	p-lvl
No, (%)	755	378 (50.1%)	377 (49.9%)					
Sports club membership yes, No (%)	301 (39.9%)	189 (50.0%)	112 (29.7%)	32.419		<.001	0.207	***
Ball specific sports club membership Yes, No (%)	151 (50.2%)	119 (63.0%)	32 (28.6%)	33.272		<.001	0.332	***
Age, y	$9.9 \pm 0.7$	$9.9 \pm 0.7$	$9.9 \pm 0.7$		0.366	0.71		
Height, cm	$142.2 \pm 7.2$	$142.2 \pm 6.9$	$142.2 \pm 7.5$		-0.1	0.92		
Weight, kg	$37.9 \pm 10.2$	$37.7 \pm 10.2$	$38.1 \pm 10.2$		-0.542	0.59		
BMI, kg/m <sup>2</sup>	$18.5 \pm 3.7$	$18.5 \pm 3.6$	$18.6 \pm 3.7$		-0.698	0.49		
EQUI BMI <sub>AUT</sub>	$22.97 \pm 3.98$	$23.38 \pm 4.20$	$22.56 \pm 3.71$		2.837	0.002		**

Data are No. (%) or mean (SD); No. = number, % = percentage,  $X^2$  = chi-square test value, t = test statistic t-test, P value = significance (two-sided),  $\phi$  = Phi as coefficient of effect size according to Cohen (small:  $\phi \geq 0.1$ ; medium:  $\phi \geq 0.3$ ; large:  $\phi \geq 0.5$ ); p-lvl = p-value level (\* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ ); y = years, kg = kilogram, cm = centimeter, m = meter, BMI = body mass index, EQUI BMI<sub>AUT</sub> = equivalent BMI based on Austrian reference centile curves passing through adult BMI values (Mayer et al, 2015).

Detailed descriptive statistics on the raw scores collected, standard deviation scores (SDS), and differences between boys and girls are presented in Table 1 and Figure 1.

Concerning sports club membership, a highly significant difference ( $p < 0.001$ ) was found between boys and girls. While 50% of boys reported to be active members of a sports club, only 29.7% of girls reported such membership (Table 1, Figures 1 and 2).



**Figure 2.** Self-reported sports club membership for the overall study population and additionally by subgroup gender.

Among children reporting membership in a sports club, boys predominantly mentioned membership in a club that focused on ball-related practices and games (63.0%). In contrast, girls predominantly reported being active in a club that taught non-ball game-oriented skills (71.4%,  $p < 0.001$ ). For details see Table 1, Figures 1 and 2.

Significant gender differences ( $p < 0.001$ ) were also found within ball game-oriented sports. Soccer was the most frequently mentioned sport (74.2%) of ball game-oriented activities, and the difference between boys (83.2%) and girls (40.6%) was most pronounced ( $p < 0.001$ ). In contrast, significantly more girls mentioned tennis when compared to boys (25.0% vs. 5.9%,  $p = 0.004$ ). Gender differences ( $p = 0.004$ ) were also reported for the group of other ball game-oriented sports (see Table 2, Figure 3).

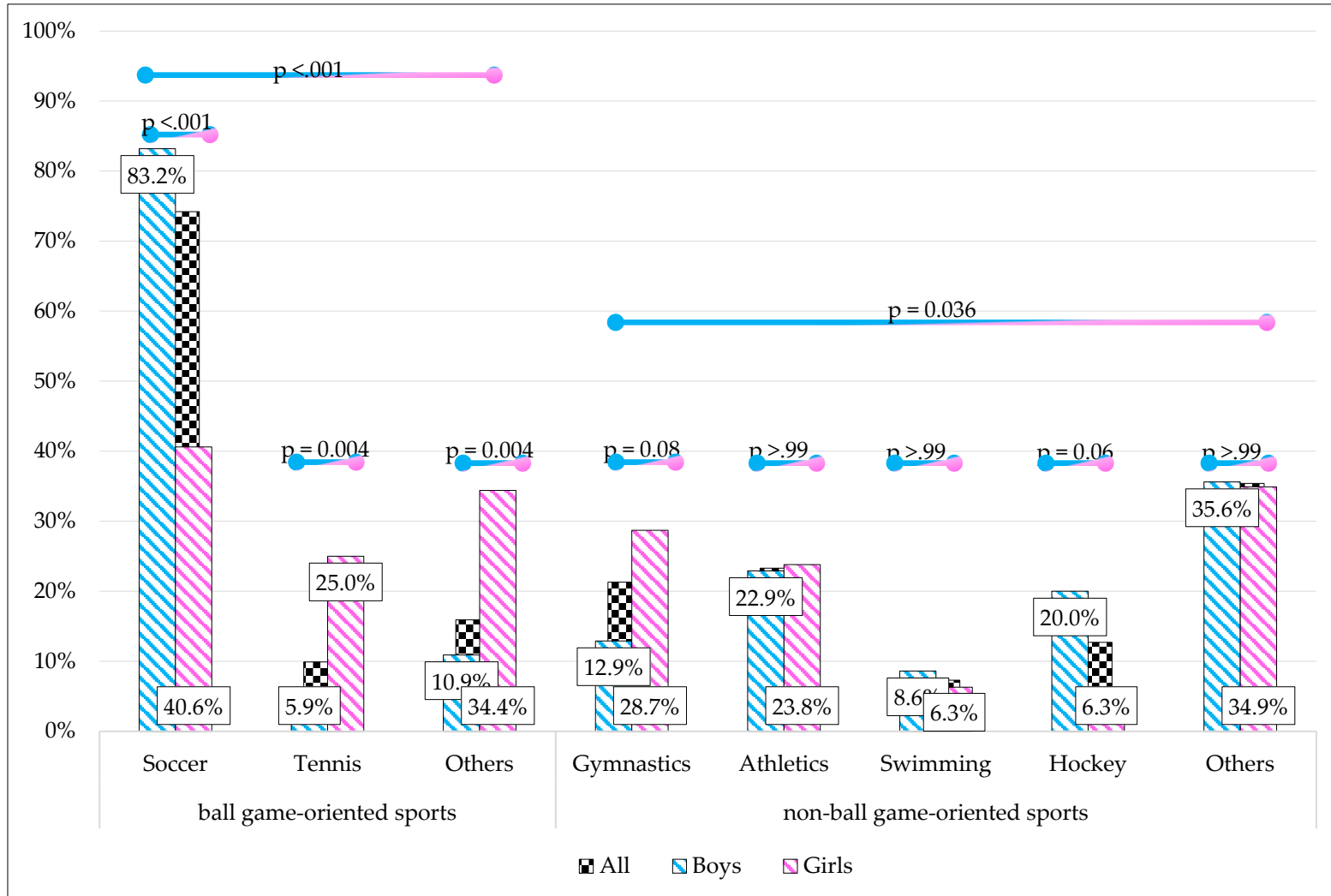


Figure 3. Self-reported detailed sports club membership for the overall study population and additionally by subgroup gender.

**Table 2.** Self-reported sports club membership for the overall study population and additionally by subgroup gender.

Sport focus	Kind of sports club	All	Boys	Girls	X <sup>2</sup> <sub>a</sub>	P value	V	P.H.T. <sub>b</sub>
<b>Ball specific sports club membership, No (%)</b>	Soccer	112 (74.2%)	99 (83.2%)	13 (40.6%)	24.165	<.001	0.400	<.001
	Tennis	15 (9.9%)	7 (5.9%)	8 (25.0%)				0.004
	Other ball sport club	24 (15.9%)	13 (10.9%)	11 (34.4%)				0.004
<b>Non-Ball specific sports club membership, No (%)</b>	Gymnastic	32 (21.3%)	9 (12.9%)	23 (28.7%)	10.285	0.036	0.262	0.08
	Athletics	35 (23.3%)	16 (22.9%)	19 (23.8%)				>.99
	Swimming	11 (7.3%)	6 (8.6%)	5 (6.3%)				>.99
	Hockey	19 (12.7%)	14 (20.0%)	5 (6.3%)				0.06
	Other sport club	53 (35.3%)	25 (35.7%)	28 (35.0%)				>.99

a) 0 cells (0.0%) have an expected frequency less than 5. The minimum expected frequency is 5.00. b) We used the Bonferroni-Holm method to correct for multiple comparisons. No. = number, % = percentage, X<sup>2</sup> = chi-square test value, P value = Asymptotic significance (two-sided), V = Cramér's V as coefficient of effect size according to Cohen (small: V ≥ 0.1; medium: V ≥ 0.3; large: V ≥ 0.5); P.H.T. = post hoc Tests adjusted by Bonferroni-Holm correction.

There was also a difference between boys and girls in the area of non-ball game-oriented sports ( $p = 0.036$ ). However, no clear attribution of single sports of this difference could be identified due to the performed error correction (Bonferroni-Holm). The lowest p-values were found for the sports of gymnastics ( $p = 0.08$ ) and ice hockey ( $p = 0.06$ ). Almost no difference was found for the sports of athletics and swimming, as well as in the category "other non-ball sports club membership" (Table 2, Figure 3).

#### 4. Discussion

Our results are in line with the findings of a comprehensive Austrian survey [36] conducted during the COVID-19 pandemic. This survey highlights a pronounced decline in sports club membership of 10-year-old children between 2017 and the end of 2020 / beginning of 2021 (period characterized by severe COVID-19-related restrictions in Austria). During this period, membership dropped from 47.7% in 2017 to 32.7% in 2020 [36,37].

The gender differences described in our present study were also existing in above mentioned previous evaluations, however overall levels were higher prior to the COVID-19 pandemic.

In 2017, 54.9% of boys reported being a member of a sports club, while only 40.5% of girls reported such membership [36]. These percentages decreased to 39.4% for boys and 26.2% for girls in 2020 (according to data from the Austrian Federal Sports Organization - BSO) [36]. Our recent study data also reflect divergent percentages with boys at 50.0% and girls at 29.7%. Thus, our values are higher when compared with the Austrian survey data during the COVID-19 lockdowns [36], however have not reached the pre-pandemic levels.

In contrast to our findings in primary school children (age 8-10 years), latest data from the European Union Eurobarometer show that the number of young people (≥ 15 years) and adults reporting sports club membership were comparable before (2017) and after COVID-19 (2022), however with a shift towards gym membership and culture clubs with physical training programs [38]. Different observations and habits in different age groups lead to the suspicion that children were particularly affected by restriction measures and may experience more negative consequences also in the long run.

Membership in a sports club has been shown to lead to higher levels of mental satisfaction compared to physical activity and exercise outside of a sports club [39].

The COVID-19 pandemic has led to major behavioral changes in children and adolescents [40] and an alarming increase in the number of children suffering from depression [41–43]. An Australian study published in 2023 reports that physical activity is a potential antidepressant, with positive effects similar to those achieved by psychotherapy or medication [44].

Children and young adolescents are not the target group for gyms and have the highest percentage of all age groups in terms of sports club membership. For children in particular, fun and enjoyment of exercise play a major role rather than competition [45]. It is therefore advisable to pursue several strategies and to combine different approaches to ensure comprehensive promotion of health development in children and adolescents.

To achieve these goals, it will be necessary to create opportunities and incentives to increase and even surpass children's membership in sports clubs to pre-COVID-19 pandemic levels. Innovative approaches to change sports competitions could play a role. For example, ballgame-related competitions could focus not only on the final score but also on the individual performance. Advancing technological capabilities could help to capture and present these individual results. In non-ballgame-related sports, pre-set timings or modified competition conditions could be applied to encourage wider participation. In our study, girls have a greater tendency to be members of nonball-related sports clubs. This trend is also reflected in a generally lower membership of girls compared to boys in various studies. Additional targeted and gender-specific incentives could help to increase the number of girls joining sports clubs. By tailoring these incentives to the specific interests and needs of girls, inhibitions could be reduced and girls could be encouraged to participate and thus to experience the multiple benefits of sports club membership.

Sports clubs play a major role in the national health promotion policies, but this aspect could be more pronounced [46]. Additional continuous evaluation of members' health development [47] could have a positive and stimulating effect.

Beyond sports clubs, schools certainly represent the optimal place to motivate a wide range of children and young people to practice sufficient physical activity regularly [28]. As a space where daily activities can be well organized, school provides an excellent opportunity to promote exercise. The school subject of physical activity and sports enjoys a high level of popularity among children, making the possibility of expanding the number of hours in this area a positively perceived initiative. Such an extension could not only help to increase physical activity, but also raise awareness of the importance of physical activity and sports in general, and thus motivate children to adopt a healthy lifestyle in the long term. The implementation of the daily moderate physical activity time of at least 60 minutes suggested by the WHO could probably additionally increase the motivation to join a sports club.

Simultaneously, it could be beneficial to introduce a standardized and user-friendly national monitoring system (for example AUT FIT [47]) which can be used in schools, sports clubs and privately. The implementation of such a system would make it possible to continuously monitor and transparently present the fitness and health development of children and adolescents. Away from simple results and scores, such a system would allow evaluation of any intervention like daily physical activity unit or raised sports club memberships.

A strength of our study is that the children were all interviewed personally by a test leader, so that any unclear aspects could be clarified directly face to face.

One limitation of our study is that we only had access to data from children in 12 schools in the greater Klagenfurt area, Austria. However, the sample size was large enough to estimate the habits of students in primary schools in Austria.

Another limitation is that the reported sports club memberships resulted from self-reflection by underage participants and no objective assessment was available.

## 5. Conclusions

Our study shows a significant gender gap concerning sports club memberships of primary school children. Beside this, boys and girls apparently prefer different sports. These differences should be considered in intervention programs, equally in and outside schools. Reduced rates of sports club membership after the COVID-19 pandemic, higher BMI values of school children and a worsening of motor skills underline the need of intervention programs, these should be age- and gender-targeted. Health authorities, schools, sports clubs and families should form an alliance to promote an overall increase of physical activity and thus to support the long-term healthy development of the young.

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**Institutional Review Board Statement:** The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Research Ethics Committee of the University of Graz, Styria, Austria (GZ. 39/23/63 ex 2018/19).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy/ethical restriction.

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