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Sports-related factors predicting maintained participation and dropout in organized sports in emerging adulthood: A four-year follow-up study

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Abstract

This study explored sports-related factors predicting organized sports participation in emerging adulthood. In the Finnish Health Promoting Sports Club (FHPSC) study, 354 sports club participants aged 15 at baseline reported their main sport, onset age, training volume, current competitive level, and future competitive orientation and participated in the follow-up study at age 19. There were differences in the proportions of maintainers and dropouts in a few sports: football (maintainers 58.6%), and among females, skating (maintainers 60.7%), and swimming (dropouts 80.0%). A binary logistic regression analysis showed that those who had started their main sport by school age (females OR 3.05/95% CI 1.34, 6.98; males OR 3.97/95% CI 1.48, 10.64) and had competed at national top level plus had aimed at success at the adult level competitions in future (females

OR 3.42/95% CI 1.16, 10.09; males OR 3.58/95% CI 1.12, 11.41; among females, also had competed at national top level plus had aimed at success at junior level competitions [OR 3.42/95% CI 1.20, 9.78]) were more likely maintainers than dropouts. Early onset in the main sport and competitiveness were related to maintained sports participation while the opposites were related to dropouts in the current organized sports system.

KEYWORDS

cohort study, competitive level, competitive orientation, sport discipline, training volume

1 | INTRODUCTION

About 40% of children (aged 5) and adolescents (aged 15) drop out of all organized sports while about 30%–50% of children and adolescents maintain their participation in sport(s) by emerging adulthood[1] (at age 19).[2,3] Dropout is defined by Gould (1987) on a continuum from dropping out of one sport (activity-specific) to dropping out of all sports permanently (domain-general).[4] Since participation in organized sports has multi-dimensional health benefits (e.g., related to fitness, body fat, lean mass, self-esteem, depressive symptoms, or social interaction),[5–7] dropping out from all sports can also be viewed as a public health concern.

Systematic reviews have shown factors impacting adolescents' organized sports participation (e.g., health and enjoyment)[8] and dropout (e.g., perceived lack of competence and injuries).[9,10] They have also revealed that prospective studies,[8,10] and research on, for example, the characteristics of club sports[8–10] and the transition into adulthood[11] are scarce. Moreover, operational definition for dropout (based on information about registration for season) was provided only by half of the studies,[10] or the majority of the studies focused on prolonged withdrawal from one sport (not all sports).[9]

International studies have shown that children's participation in organized sports has tended to begin at ever earlier ages (e.g., at age 3–4 in Denmark and Iceland),[12] adolescent (15–19 years old) club sports maintainers have *started participation at an early age*,[13] and have a longer sports history compared to dropouts.[14] Moreover, maintenance and dropout of *sports* have been shown to vary between disciplines in transition from childhood to adolescence (from age 10 to 14)[15] or to emerging adulthood (from age 10 to 23),[15] and more likely *team sports* participants maintain their participation compared to *individual sports* participants.[14] Furthermore, high *training volume* has been associated with maintained sports participation in later adolescence,[14] but also with dropout when physical, emotional, and scheduling problems as well as non-improving performance have been perceived.[17] Low *competitive levels* may also lead to dropout.[18]

Previous studies have explored organized sports participants' goal orientation,[14,19–21] and motivation,[21,22] and why they continue in sports.[13] The results suggest that (early) adult (18–61 year old) rock climbers in the United States are more task-oriented (e.g., improving one's skills) than ego-oriented (e.g., social comparison).[21] Moreover, the early onset age in sports, high training volume, and competitive experience have been associated with high skill development and competing motivations among Brazilian (12–18 years old) adolescent athletes in different sports.[22] Furthermore, team sports have been associated with high skill development motivation and individual sports with high competitive motivation.[22] Also, c*ompetitiveness* has been associated with maintaining sports participation in later adolescence.[13,14] However, longitudinal research is lacking on the association of *recreational*, *physical development*, *and competitive orientations* with maintained participation and dropout in organized sports.

In Finland too, mean *onset age* in organized sports in general has decreased over the decades (12 years before 1950s, 10 years in 1960s, 8 years in 1980s, and 7 years in the 21st century).[23–25] Current upper secondary school adolescents (16–20 year olds) have started on average at age 7, with football as their most *popular sport* (15%) (followed by dancing, horse riding, ice hockey, and floorball), average of three coach-led (90 min each), and one to two self-directed (75 min each) main sport *training sessions* weekly.[25] Overall, 73% of them (females 67%, males 82%) participate in *competitions*; 35% (f 28%, m 44%) at national level and 37% (f 24%, m 29%) at regional/local level competitions. Overall, 57% of adolescents (f 53%, m 62%) have *competitive orientation*: success at adult level [29% (f 23%, m 37%)] or at junior level [28% (f 30%, m 25%)] competitions. On the other hand, many adolescents participate without competitive orientation (43%, f 47%, m 38%).[25] Adolescents continue

in some sport disciplines (e.g., ice hockey) to a later age compared to some other disciplines (e.g., track and field).[26] Moreover, those who have high competitive orientation train more,[27] and maintainers have higher ego and task orientation than dropouts do.[28]

To date, there is lack of longitudinal studies exploring various sports-related factors simultaneously and non-competitive aspects as predictors of maintained organized sports participation and dropout. Identifying factors that favor maintained participation and dropout in organized sports among adolescents is important for supporting lifelong participation. Therefore, as permitted by the cohort data of the Finnish Health Promoting Sports Club (FHPSC) study,[29] the aim of the present study was to explore how various sports-related factors in adolescence predict organized sports participation in emerging adulthood. Maintained participation is considered as continuous participation in organized sport(s), and dropout as withdrawal from all organized sports during this four-year follow-up study.

2 | MATERIALS AND METHODS

2.1 | Sample

This study was based on the longitudinal health behavior questionnaire data of the Finnish Health Promoting Sports Club (FHPSC) study. In baseline (years 2013–14), 870 sports club participants aged 15 (mean age 15.4, SD 1.3; males 58%) from the six districts of the Centres of Excellence in Sports and Exercise Medicine in Finland answered sports-related queries. Of these, 354 participated in the follow-up study (years 2017–18) at age 19 (mean age 19.6, SD 1.4; males 43%) being sports club participants (i.e., maintainers, $n = 161$) or nonparticipants (i.e., dropouts, $n = 193$). The study participants represented the ten most popular winter and summer sports in Finland: basketball, cross-country skiing, floorball, ice hockey, skating, football, gymnastics, orienteering, swimming, and track and field. A detailed description of the baseline data collection can be found in the FHPSC study protocol article,[29] and of follow-up data collection in the recent FHPSC study.[3]

2.2 | Ethics

The Ethics Committee of the Healthcare District of Central Finland approved the study in 2012 and 2016 (record number 23U/2012&2016). Informed written consent was gathered from participants, and when participants were under 18 years old, from their guardians.

2.3 | Measures

Longitudinal organized sports participation patterns constructed in the previous FHPSC study[3] were used as the dependent variable with the categories of *maintainers* (reported participation in club sport training at baseline *and* follow-up) and *dropouts* (reported participation in club sport training at baseline but *not* in follow-up). *Sports-related factors* reported at age 15 at baseline were used in this current study as independent variables. The same kinds of survey items related to these factors and described below have been used in previous studies.[22,29–31]

Reported *main sports* (i.e., sports in which the adolescent participated the most) were coded according to the above-mentioned ten most popular winter and summer *sport disciplines* (also from the follow-up study data). The variable *type of sport* was created with two categories—*individual* and *team sport*—due to the small number of participants in some sports.

Study participants reported age of *onset of participation in their main sport*. The answers were categorized as *≤7*, *8–10*, *and 11–15* years (average age for onset of participation in main sport was 8.2 years) for discovering the most informative differences between maintainers and dropouts.

Adolescents reported the typical amount of coach-led main sport training sessions/week, self-directed main sport training sessions/week, and training minutes/session of these two training modes. *Main sport training volume (hours/typical week)* was calculated. The variable was dichotomized as ≤9 h/week (0–9 h) and >9 h/week (9.2–33.0) (average main sport training volume/week was 8.9 h).

Current competitive level was asked about with the following response options: 'National top level', 'Other national level like I Division', 'Regional level', 'Local level', 'I/we do not compete'. These were dichotomized as *national top-level* and *lower than national top-level* (all the other options).

Future competitive orientation as an athlete (the highest goal level) was asked about with the following response options: 'I have no competitive orientation, I play sports for recreation, 'I have no competitive orientation, I play sports for physical development', 'Success at junior regional/local level competitions', 'Success at junior national level competitions (national top level or similar)', 'Success at junior international level competitions', 'Success at adult national level competitions (national top level)', 'Success at adult international level competitions (European/World Championship or professional)'. These were categorized as *no competitive orientation*, *success at junior-level competitions*, and *success at adult-level competitions*.

The variable *current competitive level and future competitive orientation* were formed by combining the

recategorized current competitive level with the recategorized future competitive orientation, for a total of six categories: *national top level and success at adult level competitions*, *or success at junior level competitions*, *or no competitive orientation; lower than national top level and success at adult level competitions*, *or success at junior level competitions*, *or no competitive orientation*.

2.4 | Statistical analysis

The analyses were performed using SPSS Version 26, with the statistical significance set at $p < 0.05$. Differences in the proportions of maintainers and dropouts in the ten main sports, also separately among females and males, were assessed using chi-square test and Fisher's exact test. The maintenance of sports disciplines from age 15 to age 19 was explored using crosstabs. Differences in other sports-related factors between maintainers and dropouts, between individual and team sports maintainers as well as individual and team sports dropouts were assessed using a chi-square test and *z*-test. Differences between the main sport training hours and future competitive orientation were assessed using a chi-square test. The effect size was estimated by Cramer's V. The factors showing statistically significant differences in the bivariate analyses between maintainers and dropouts were entered into binary logistic regression analysis separately by gender for identifying the predictors of maintained organized sports participation and dropout. As there was interaction between the variables of current competitive level and future competitive orientation, the combined variable was used as a more interpretable variable.

3 | RESULTS

Among the ten *main sports* reported at age 15, there were differences in the proportions of maintainers and dropouts in football (maintainers 58.6%, χ^2 (1) = 4.83, $p = 0.028$, effect size = 0.12), and when females were explored separately, in skating (maintainers 60.7%, χ^2 (1) = 5.52, $p = 0.019$, effect size = 0.17), and swimming (dropouts 80.0%, χ^2 (1) = 3.88, $p = 0.049$, effect size = 0.14) at age 19. Among males, there was no difference in any main sport (Table 1).

All maintainers who had reported football, floorball, orienteering, or track and field ($n = 14$–31) as the main sport at age 15 reported the same sport as the main sport at age 19. Among the other main sports ($n = 9$–16), few participants had changed their main sport by age 19.

Onset of participation in main sport, *training volume*, *current competitive level* and, *future competitive orientation* were associated with organized sports participation at age 19. The distributions are presented in Table 2.

Training volume was associated with *future competitive orientation*. Adolescents who trained their main sport over 9 h/week at age 15 ($n = 120$) had more success at adult-level competitions as an orientation (60.0%) than success at junior-level competitions (31.7%) or no competitive orientation (8.3%) (χ^2 (2) = 37.23, $p < 0.001$, effect size = 0.34). Those who trained their main sport for a maximum of 9 h/week ($n = 203$) had more success at junior-level competitions as an orientation (44.3%) than success at adult-level competitions (27.6%) or no competitive orientation (28.1%).

When the sports-related factors were simultaneously explored, *onset of the main sport* and *current competitive level together with future competitive orientation* predicted organized sports participation. Onset of the main sport by age 7 compared to by age 11 or later (*females* 3.05, CI 1.34–6.98, $p = 0.008$; *males* 3.97, CI 1.48–10.64, $p = 0.006$), and competing at national top level aiming at success at adult-level competitions compared to lower or non-competitive level and non-competitive orientation (*females* 3.42, CI 1.16–10.09, $p = 0.026$; *males* 3.58, CI 1.12–11.41, $p = 0.031$) increased the odds of being a maintainer rather than a dropout at age 19. In addition, among *females*, a combination of competing at the national top level and having success at junior-level competitions as an orientation increased the odds of being a maintainer rather than a dropout (3.42, CI 1.20–9.78, $p = 0.022$) (Table 3).

The distribution of individual and team sports maintainers and individual and team sports dropouts by sports-related factors is presented in Table 4.

4 | DISCUSSION

This study explored how various sports-related factors predicted maintained participation and dropout in organized sports in a cohort from adolescence to emerging adulthood.

As a result of exploring *main sports*, there were differences in the proportions of maintainers and dropouts in a few sports at age 19. Previous studies have shown variability in the maintenance, start, and dropout of different sports,[15,16,26] and suggest that this is due to cultural context,[15,16] opportunities to participate, promotion by national-level associations,[16] and the studied age group.[15] Hence, in Finland, a larger proportion of maintainers compared to dropouts in football may be due to better promotion of the sport and the availability of clubs and teams of different levels because of the large number of participants. On the other hand, in figure skating, a need for

TABLE 1 Distributions of maintainers and dropouts at age 19 by main sport discipline reported at age 15 ($n = 354$).

	Total							Females							Males						
		Maintainers ($n = 161$)	Dropouts ($n = 193$)	χ^2			Effect size		Maintainers ($n = 81$)	Dropouts ($n = 119$)	χ^2			Effect size		Maintainers ($n = 80$)	Dropouts ($n = 73$)	χ^2			Effect size
Main sport discipline at age 15	***n***	**%**		**Value**	**df**	***p***	**Cramer's V**	***n***	**%**		**Value**	**df**	***p***	**Cramer's V**	***n***	**%**		**Value**	**df**	***p***	**Cramer's V**
Skating	30	60.0	40.0	2.79	1	0.095	0.09	28	60.7	39.3	5.52	1	**0.019**	0.17	2	50.0	50.0	0.00	1	1.000[a]	0.01
vs. Other sports	324	44.1	55.9					172	37.2	62.8					151	52.3	47.7				
Football	58	58.6	41.4	4.83	1	**0.028**	0.12	23	52.2	47.8	1.47	1	0.225	0.09	35	62.9	37.1	2.03	1	0.154	0.12
vs. Other sports	296	42.9	57.1					177	39.0	61.0					118	49.2	50.8				
Floorball	36	47.2	52.8	0.05	1	0.825	0.01	13	53.8	46.2	1.03	1	0.311	0.07	23	43.5	56.5	0.84	1	0.359	0.07
vs. Other sports	318	45.3	54.7					187	39.6	60.4					130	53.8	46.2				
Cross-country skiing	34	47.1	52.9	0.04	1	0.846	0.01	18	38.9	61.1	0.02	1	0.884	0.01	16	56.3	43.8	0.11	1	0.737	0.03
vs. Other sports	320	45.3	54.7					182	40.7	59.3					137	51.8	48.2				
Orienteering	30	46.7	53.3	0.02	1	0.891	0.00	22	54.5	45.5	2.02	1	0.155	0.10	8	25.0	75.0	2.52	1	.152[a]	0.13
vs. Other sports	324	45.4	54.6					178	38.8	61.2					145	53.8	46.2				
Ice hockey	31	45.2	54.8	0.00	1	0.970	0.00	3	0.0	100.0	2.07	1	0.273[a]	0.10	28	50.0	50.0	0.07	1	0.789	0.02
vs. Other sports	323	45.5	54.5					197	41.1	58.9					125	52.8	47.2				
Basketball	33	42.4	57.6	0.14	1	0.711	0.02	18	33.3	66.7	0.42	1	0.516	0.05	15	53.3	46.7	0.01	1	0.932	0.01
vs. Other sports	321	45.8	54.2					182	41.2	58.8					138	52.2	47.8				
Track and field	42	35.7	64.3	1.83	1	0.176	0.07	27	25.9	74.1	2.75	1	0.097	0.12	15	53.3	46.7	0.01	1	0.932	0.01
vs. Other sports	312	46.8	53.2					173	42.8	57.2					138	52.2	47.8				
Gymnastics	30	33.3	66.7	1.95	1	0.163	0.07	28	32.1	67.9	0.94	1	0.331	0.07	2	50.0	50.0	0.00	1	1.000[a]	0.01
vs. Other sports	324	46.6	53.4					172	41.9	58.1					151	52.3	47.7				
Swimming	30	30.0	70.0	3.17	1	0.075	0.10	20	20.0	80.0	3.88	1	**0.049**	0.14	9	55.6	44.4	0.04	1	1.000[a]	0.02
vs. Other sports	324	46.9	53.1					180	42.8	57.2					144	52.1	47.9				

Note: Bold indicates significant *p*-values.

[a]*Fisher's exact test*.

TABLE 2 Distributions of maintainers and dropouts at age 19 by sports-related factor reported at age 15 ($n = 323$).

		Maintainers ($n = 1490$	Dropouts ($n = 174$)	χ^2			Effect size
Sports-related factors at age 15	***n***	**%**		**Value**	**df**	***p***	**Cramer's V**
Type of main sport							
Team	169	50.3	49.7	2.48	1	0.116	0.09
Individual	154	41.6	58.4				
Onset of participation in main sport							
≤7 yr.	143	58.0[a]	42.0[a]	17.81	2	**<0.001**	0.24
8–10 yr.	104	42.3	57.7				
11–15 yr.	76	28.9[a]	71.1[a]				
Main sport training volume (hours/typical week)							
>9	120	55.0[a]	45.0[a]	6.05	1	**0.014**	0.14
≤9	203	40.9[a]	59.1[a]				
Current competitive level							
National top level	174	52.9[a]	47.1[a]	6.90	1	**0.009**	0.15
Lower than national top level	149	38.3[a]	61.7[a]				
Future competitive orientation							
Success at adult-level competitions	128	60.2[a]	39.8[a]	19.80	2	**<0.001**	0.25
Success at junior-level competitions	128	41.4	58.6				
No competitive orientation	67	28.4[a]	71.6[a]				
Current competitive level & future competitive orientation							
National top level & success at adult-level competitions	96	61.5[a]	38.5[a]	21.94	5	**0.001**	0.26
Lower than national top level & success at adult-level competitions	32	56.3	43.8				
National top level & success at junior-level competitions	64	46.9	53.1				
Lower than national top level & success at junior-level competitions	64	35.9	64.1				
Lower than national top level & no competitive orientation	53	30.2[a]	69.8[a]				
National top level & no competitive orientation	14	21.4	78.6				

[a]Difference according to *z*-test.

high investments and international success may explain the larger proportion of maintainers compared to dropouts among females.

Previous research suggests that there may be a stable period in the activity changes after puberty.[15] In addition, in the current study, only a few adolescents had *changed* their main sport. One interpretation is that the organized sports system emphasizes competitiveness that does not allow a later start. Moreover, few adolescents may participate in various sports and are hence able to change their main sport, or the adolescents may choose their main sport at an earlier age. The results highlight a need to develop and promote possibilities to change and start sport later in adolescence for lifelong participation.

This study shows that the *onset of participation in the main sport* by school age is predicted maintain participation in organized sports. Moreover, finding one's main sport at an early school age predicted that maintaining participation was as likely as dropping out. Previous studies have explored the overall onset of participation in organized sports, showing that late teenage maintainers had started participation at an early age,[13] and earlier than dropouts.[14] One interpretation is that parents' support in sport (e.g., encouragement, transport, and doing physical activity or sports with child or adolescent) through childhood and adolescence affect early and maintained participation.[3,32] Moreover, early participation may lead to the formation of organized sports

TABLE 3 Sports-related factors predicting maintained participation compared to dropping out by gender ($n = 323$).

Sports-related factors at age 15	Females ($n = 184$)	OR (95% CI)	p	Males ($n = 139$)	OR (95% CI)	p
Onset of participation in main sport						
≤7 yr.	73	3.05 (1.34–6.98)	**0.008**	70	3.97 (1.48–10.64)	**0.006**
8–10 yr.	64	1.69 (0.71–4.02)	0.233	40	1.72 (0.59–5.03)	0.320
11–15 yr.	47	1		29	1	
Main sport training volume (hours/typical week)						
>9	60	0.75 (0.37–1.53)	0.434	60	1.79 (0.81–3.99)	0.153
≤9	124	1		79	1	
Current competitive level & future competitive orientation						
National top level & success at adult-level competitions	44	3.42 (1.16–10.09)	**0.026**	52	3.58 (1.12–11.41)	**0.031**
National top level & success at junior-level competitions	45	3.42 (1.20–9.78)	**0.022**	19	0.94 (0.25–3.64)	0.933
National top level & no competitive orientation	9	0.94 (0.16–5.66)	0.945	5	0.29 (0.03–3.36)	0.321
Lower than national top level & success at adult-level competitions	11	3.39 (0.72–15.97)	0.122	21	2.98 (0.80–11.15)	0.104
Lower than national top level & success at junior-level competitions	43	1.89 (0.66–5.41)	0.233	21	1.01 (0.28–3.70)	0.990
Lower than national top level & no competitive orientation	32	1		21	1	

Note: Females: $R^2 = 0.09$ (Cox & Snell), 0.12 (Nagelkerke). Model χ^2 (8) = 17.28; Males: $R^2 = 0.18$ (Cox & Snell), 0.24 (Nagelkerke). Model χ^2 (8) = 27.79.
Abbreviations: CI, confidence interval; OR, odds ratio.

participation as a lifestyle habit and hence maintain participation, as research has shown that a physically active lifestyle tracks from early childhood onwards.[33] On the other hand, competitiveness in the current sports system requires the early onset of participation. Moreover, later onset compared to one's peers may negatively affect perceived competence, which is an important dropout reason among adolescents.[9,10]

Previous international research has shown the health benefits of organized physical activity at an early age (age 0–4),[34] and that early participation (age 2–5) in organized individual or team sports (e.g., dance, judo, hydro-gymnastics, t-ball) is mostly beneficial in psychosocial development.[35,36] Although the current study did not explore if adolescents had participated only in the main sport or various sports, it suggests that a long training history in the main sport seems not necessarily to lead to getting bored with the sport, which is, however, one significant dropout reason in late adolescence.[3] This is supported by recent studies that suggest, contrary to earlier understanding, that *early sport specialization* may not be a dropout risk.[37,38] Hence, encouragement to find enjoyable sports by school age may be in many ways beneficial and better ensure maintained participation in organized sports in emerging adulthood.

This study showed that those who had had a high *main sport training volume* were more often maintainers than dropouts in line with previous research.[14] Moreover, high future competitive orientation was associated with high training volume as in the previous FHPSC study,[27] and the result supports the study that associated high competitive motivation with high training volume.[22] However, in the current study, when training volume was explored simultaneously with other sports-related factors, it did not predict maintained participation. It seems that high training volume does not necessarily lead to boredom and dropout, and that it depends on how other factors support or disturb sports participation. High training volume may be seen as a sacrifice or an investment that keeps one playing sports. Research has shown that high training volume with perceived tiredness, negative relationships in sports, scheduling problems, and non-improving performance may lead to dropout.[17] Providing sufficient rest and sleep, flexibility in sport (goals) and other activities (e.g., school studies[3]), and positive relationships in sports could support maintained participation.

The highest *current competitive level* and highest *future competitive orientation* characterized more maintainers than dropouts, a finding that is in line with

TABLE 4 Distributions of individual and team sports maintainers and individual and team sports dropouts at age 19 by sports-related factor reported at age 15 ($n = 323$).

	Maintainers ($n = 149$)							Dropouts ($n = 174$)						
		Individual	Team	χ^2			Effect size		Individual	Team	χ^2			Effect size
Sports-related factors at age 15	***n***	**%**		**Value**	**df**	***p***	**Cramer's V**	***n***	**%**		**Value**	**df**	***p***	**Cramer's V**
Onset of participation in main sport														
≤7 yr.	83	41.0	59.0	0.58	2	0.748	0.06	60	51.7	48.3	0.53	2	0.765	0.06
8–10 yr.	44	47.7	52.3					60	55.0	45.0				
11–15 yr.	22	40.9	59.1					54	48.1	51.9				
Main sport training volume (hours/typical week)														
>9	66	34.8	65.2	3.18	1	0.075	0.15	54	63.0[a]	37.0[a]	3.96	1	**0.047**	0.15
≤9	83	49.4	50.6					120	46.7[a]	53.3[a]				
Current competitive level														
National top level	92	52.2[a]	47.8[a]	8.35	1	**0.004**	0.24	82	63.4[a]	36.6[a]	8.49	1	**0.004**	0.22
Lower than national top level	57	28.1[a]	71.9[a]					92	41.3[a]	58.7[a]				
Future competitive orientation														
Success at adult-level competitions	77	45.5	54.5	1.20	2	0.548	0.09	51	62.7	37.3	6.12	2	**0.047**	0.19
Success at junior-level competitions	53	43.4	56.6					75	41.3[a]	58.7[a]				
No competitive orientation	19	31.6	68.4					48	56.3	43.8				

[a]Difference according to z-test.

previous research showing adolescent maintainers are willing or adapting themselves to compete[13,14,28] or to be more ego-oriented than dropouts are.[28] Moreover, maintainers' early onset of participation in their main sport and competitiveness are in line with the research that shows an association of early onset with competitive and skill development motivation.[22] The current study results also support previous research showing that participation at a lower competitive level may predict dropout.[18] One reason may be the lack of motivation if there are no opportunities (e.g., due to the team's competitive goals or the athlete's competence) to rise to a higher competitive level. This study also showed that participation without a competitive orientation, that is, a recreational or developmental goal, may predict dropout. This again may be due to the current sports system emphasizing competitiveness and not providing alternative, less competitive, or recreational activities, as also suggested by Thedin Jakobsson.[13] Furthermore, not all the *female* maintainers in this current study aimed at success at adult-level competitions, that is, not at a long competitive sports career. Competitiveness (and perhaps encouragement for that) may better ensure maintained participation in the current organized sports. However, it is important to provide alternatives for strongly competitive sports and get adolescents to discuss attractive activities and goals if the aim is the lifelong participation of as many adolescents as possible.

Results concerning the *type of sport* showed that high training volume and competitive level were more common in individual sports than they were in team sports. Previous research has shown that individual sport participants have high competitive motivation,[22] but also, contrary to the current study results, that they drop out more often than do team sport participants, which may relate to personal experience of failure in competitions.[14] Mental support may be needed especially for individual sport participants with perceived failures and goals.

4.1 | Strengths and limitations

The strengths of this study include its longitudinal sample of a rarely studied age bracket covering the most popular winter and summer sports in Finland. Moreover, this study focused on various sports-related factors and took into account non-competitive participation and orientation predicting organized sports participation which were not seen in previous research.[16,18] This is of importance since there is evidence of many organized sports participants having recreational reasons for participation,[25] and when the aim is to prevent dropout. Note that there were no differences in the competitive levels and orientations between those who participated in both study time points and those who participated only in the baseline study.

One limitation of the study is that self-reported training volumes may not equal the actual training sessions and minutes. Moreover, this study did not reveal if training volumes, competitive level, and orientation changed over time. In future research, objective training volume measurements compared with volumes from different kinds of training sessions would increase reliability. Note also that more females than males continued the follow-up study. In addition to sports-related factors, various other individual, social, and environmental factors may affect maintained participation in organized sports in emerging adulthood, and it is important to study attractive organized sports activities from adolescents' point of view.

5 | PERSPECTIVES

Since participation in organized sports has multi-dimensional health benefits,[5–7] dropping out can be viewed as a public health concern. This study showed that there were differences in the proportions of maintainers and dropouts in a few main sports, and only a few adolescents changed their main sport by age 19. This may be due to opportunities to participate and promotion of the sport as shown also in previous research.[16] Moreover, in line with previous studies,[13,14,18] early onset in main sport and competitiveness are related to maintained sports participation while the opposites are related to dropout in the current organized sports system. These results suggest that supporting early onset in organized sports may ensure later participation since physically active lifestyle starts to develop in early childhood.[33] Moreover, sport system emphasizing early specialization and competitiveness suits some adolescents while among the others it may lead to dropout. In addition to competitiveness in club sports, less competitive and more recreational organized sports as well as possibilities to join in and change the sport later in adolescence are needed for avoiding constant dropout. It is also important to discuss the benefits of organized sports and various possibilities to participate with adolescents.

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CONFLICT OF INTEREST STATEMENT

The authors report no conflict of interest.

DATA AVAILABILITY STATEMENT

The data for this study are not publicly available, because they contain identification information. However, some parts of the data may be requested from the principle investigator (SK) upon reasonable request.

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REFERENCES

1. Arnett JJ. Emerging adulthood: a theory of development from the late teens through the twenties. *Am Psychol*. 2000; 55:469-480.
2. Kwon S, Janz KF, Letuchy EM, Burns TL, Levy SM. Developmental trajectories of physical activity, sports, and television viewing during childhood to young adulthood: Iowa bone development study. *JAMA Pediatr*. 2015;169(7):666-672.
3. Rinta-Antila K, Koski P, Heinonen OJ, et al. Educational and family-related determinants of organized sports participation patterns from adolescence to emerging adulthood: a four-year follow-up study. *Int J Health Promot Educ*. 2022;1-15. doi:10.1080/14635240.2022.2116943
4. Gould D. Understanding attrition in children's sport. In: Gould D, Weiss MR, eds. *Advances in Pediatric Sport Sciences, Behavioral Issues*. Vol. 2. Human Kinetics; 1987:61-85.
5. Eime RM, Young JA, Harvey JT, Charity MJ, Payne WR. A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. *Int J Behav Nutr Phys Act*. 2013;10:98.
6. Howie EK, Mcveigh JA, Smith AJ, Straker LM. Organized sport trajectories from childhood to adolescence and health associations. *Med Sci Sports Exerc*. 2016;48(7):1331-1339.
7. Telford RM, Telford RD, Cochrane T, Cunningham RB, Olive LS, Davey R. The influence of sport club participation on physical activity, fitness and body fat during childhood and adolescence: the LOOK longitudinal study. *J Sci Med Sport*. 2016;19:400-406.
8. Hopkins CS, Hopkins C, Kanny S, Watson A. A systematic review of factors associated with sport participation among adolescent females. *Int J Environ Res Public Health*. 2022;19:3353.
9. Balish SM, Rainham D, Blanchard C. Correlates of youth sport attrition: a review and future directions. *Psychol Sport Exerc*. 2014;15:429-439.
10. Crane J, Temple V. A systematic review of dropout from organized sport among children and youth. *Eur Phy Educ Rev*. 2015;21(1):114-131.
11. Lounassalo I, Salin K, Kankaanpää A, et al. Distinct trajectories of physical activity and related factors during the life course in the general population: a systematic review. *BMC Public Health*. 2019;19:271.
12. Green K, Sigurjónsson T, Skille EÅ. Conclusion. In: Green K, Sigurjónsson T, Skille EÅ, eds. *Sport in Scandinavia and the Nordic Countries*. Routledge; 2019:173-204.
13. Thedin JB. What makes teenagers continue? A salutogenic approach to understanding youth participation in Swedish club sports. *Phys Educ Sport Pedagogy*. 2014;19(3):239-252.
14. Baron-Thiene A, Alfermann D. Personal characteristics as predictors for dual career dropout versus continuation – a prospective study of adolescent athletes from German elite sport schools. *Psychol Sport Exerc*. 2015;21:42-49.
15. Brooke HL, Corder K, Griffin SJ, van Sluijs EMF. Physical activity maintenance in the transition to adolescence: a longitudinal study of the roles of sport and lifestyle activities in British youth. *PLoS ONE*. 2014;9(2):e89028.
16. Hardie Murphy M, Rowe DA, Woods CB. Impact of physical activity domains on subsequent physical activity in youth: a 5-year longitudinal study. *J Sports Sci*. 2017;35(3):262-268.
17. Larson HK, McHugh TLF, Young BW, Rodgers WM. Pathways from youth to masters swimming: exploring long-term influences of youth swimming experiences. *Psychol Sport Exerc*. 2019;41:12-20.
18. Moulds K, Abbott S, Pion J, Brophy-Williams C, Heathcote M, Cobley S. Sink or swim? A survival analysis of sport dropout in Australian youth swimmers. *Scand J Med Sci Sports*. 2020;30:2222-2233.
19. Duda JL, Chi L, Newton ML, Walling MD, Catley D. Task and ego orientation and intrinsic motivation in sport. *Int J Sport Psychol*. 1995;26:40-63.
20. Nicholls JG, Cheung PC, Lauer J, Patashnick M. Individual differences in academic motivation: perceived ability, goals, beliefs, and values. *Learn Individ Differ*. 1989;1(1):63-84.
21. Gonzales GB. Motivation and goal grientation in rock climbers. *J Sport Behav*. 2019;42:48-62.
22. Guedes DP, Netto JES. Sport participation motives of young Brazilian athletes. *Percept Mot Skills*. 2013;117(3):742-759.
23. Koski P. *Liikunta- ja urheiluseurat muutoksessa. Helsinki: Suomen Liikunta ja Urheilu*. SLU-julkaisusarja 7/09. SLU; 2009.
24. Koski P, Mäenpää P. Suomalaiset liikunta- ja urheiluseurat muutoksessa 1986–2016. Opetus- Ja kulttuuriministeriön Julkaisuja, 25 2018.
25. Mononen K, Blomqvist M, Koski P, Kokko S. Urheilu ja seuraharrastaminen. In: Kokko S, Hämylä R, Martin L, eds. *Nuorten liikuntakäyttäytyminen Suomessa; LIITU-tutkimuksen tuloksia 2020 [the physical activity behaviours of adolescents in Finland;*

results of the LIITU Study]. State Sport Council Publications: Vol 1; 2021:36-45.
26. Lehtonen K, Lämsä J, Pesonen P, Hakonen H. *Kilpailuluvasta toimijarekisteriksi - lajiliittojen lisenssiselvitys 2017*. LIKES& KIHU; 2018.
27. Aira T, Salin K, Vasankari T, et al. Training volume and intensity of physical activity among young athletes: the Health Promoting Sports Club (HPSC) study. *Adv Phys Educ*. 2019;9:270-287.
28. Rottensteiner C, Tolvanen A, Laakso L, Konttinen N. Youth athletes' motivation, perceived competence, and persistence in organized team sports. *J Sport Behav*. 2015;38(4):432-449.
29. Kokko S, Selänne H, Alanko L, et al. Health promotion activities of sports clubs and coaches, and health and health behaviours in youth participating in sports clubs: the Health Promoting Sports Club study. *BMJ Open Sport Exerc Med*. 2015;1:e000034.
30. Kokko S. *Health Promoting Sports Club - Youth Sports club's Health Promotion Profiles, Guidance, and Associated Coaching Practice*. University of Jyväskylä; 2010.
31. Kokko S, Hämylä R. *Lasten ja nuorten liikuntakäyttäytyminen Suomessa. LIITU-tutkimuksen tuloksia 2014 [the physical activity behaviours of children and adolescents in Finland; results of the LIITU study 2014]*. State Sport Council Publications; 2015: Vol 2:2015.
32. Jakobsson BT, Lundvall S, Redelius K, Engström LM. Almost all start but who continue? A longitudinal study of youth participation in Swedish club sports. *Eur Phy Educ Rev*. 2012;18(1):3-18.
33. Telama R, Yang X, Leskinen E, et al. Tracking of physical activity from early childhood through youth into adulthood. *Med Sci Sports Exerc*. 2014;46(5):955-962.
34. Carson V, Lee EY, Hewitt L, et al. Systematic review of the relationships between physical activity and health indicators in the early years (0–4 years). *BMC Public Health*. 2017;17:854.
35. Harlow M, Wolman L, Fraser-Thomas J. Should toddlers and preschoolers participate in organized sport? A scoping review of developmental outcomes associated with young children's sport participation. *Int Rev Sport Exerc Psychol*. 2020;13(1):40-64.
36. McNeill J, Howard SJ, Vella SA, Cliff DP. Longitudinal associations of physical activity and modified organized sport participation with executive function and psychosocial health in preschoolers. *J Sports Sci*. 2020;38(24):2858-2865.
37. Larson HK, Young BW, McHugh TLF, Rodgers WM. Markers of early specialization and their relationships with burnout and dropout in swimming. *J Sport Exerc Psychol*. 2019;41(1):46-54.
38. Downing C, Redelius K, Nordin-Bates S. Early specialisation among Swedish aesthetic performers: exploring motivation and perceptions of parental influence. *Int J Sport Exerc Psychol*. 2022;20(4):1013-1032.

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