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Research Article

The Quantified Athlete: Associations of Wearables for High School Athletes

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The adoption of wearable technology in competitive sports can be an advantage to performance and training. Athletes who use personalised data to quantify their performances with the possibilities of sharing with others may use wearables to reinforce the athletic identity. Despite these changes, few studies have actually examined the associations between wearables and developing athletes in their quest for professional sports. Student athletes (n = 437, age = 17y) still in high schools completed a web-based survey about their professional aspirations, athletic identity, and the association with wearables. Wearables were measured by ownership and usage of apps, fitness trackers, or sports watches. Odds ratio (OR) and 95% confidence intervals (CI) were reported. Most high school athletes had apps (64.3%) or fitness trackers (65.2%) and over half of the athletes (58%) had aspirations for professional sport. Athletic identity was positively associated with ownership and usage of apps and fitness trackers. The OR was greater for professional sport aspiration with fitness trackers owners (OR = 2.60, CI = 1.44-4.73) and users (OR = 4.04, CI = 2.09-7.81) than athletes without fitness trackers. Wearables were common among high school athletes and it was part of their athletic identity. For professional aspiring athletes, wearables have the potential to help provide data to support suitable training and competition schedules at a time when students may be overloaded with academic pressures.

1. Introduction

The technological advances, lowered costs, and public interest have allowed wearables to be widely available. Although the majority of users have been targeted for adult use, there has been recent interest among high school students' use [1]. As high school athletes attempt to strive for excellence in their sports, they are also expected to complete their education at the same time [2]. High school athletes may find it difficult to cope with the pressures and expectations of them [3]. Some may feel they are considered as athletes first and then student, and others may feel they are high school student first and then athlete. High school athletes need to manage time so that they can complete their academic achievements as well as sporting ones. With the advent of technological tools in the last 10 years, such as wearables, mobile apps, and online programs, there is good potential that high school athletes can find the right balance with their schedules. As such, it is surprising how few studies have investigated the mediating effect of wearables among high school athletes [1].

Wearables consist of sensors that athletes wear on them [4]. The majority are designed whereby there is a graphical user interface that provides information about the sensor. For the majority of commercially available wearables, the graphical user interface is designed in a way to provide personalised data. More advanced interfaces allows the users to share their data to others, and for athletes, this could be for their coach, team mates, rivals, and the public. In professional arenas, data from wearables are used to supplement sport commentary [5]. For example, the NBA set up six cameras above the court and take detailed information about all the athlete's movements at a rate of 25 times per second, resulting in approximately 72,000 unique movements per game [6]. Although data from professional sport may be public, in the form of match statistics and individual performances, another aspect that has increasing interest is

the quantified self (hereafter, QS) movement [7]. Examples of this in sport are often seen among endurance athletes who have reported the use of QS tools to tailor their training programmes [8] as well as in team sports for training loads [9].

The appeal of QS for tools that lead to optimisation is present among top athletes who use rational choice theories and actions related to calculated optimal choices [10]. Early experiments that provided real-time emotion tracking in the 1980s by Mihaly Czikszehtmihalyi suggested that the tracking tools had the capability to provide physiological data as well as logging psychological states, moods, and emotions [11]. The QS is "focused on the individual self, improving the self, and developing self-knowledge" [12] and hence presents a bridge between sports performance data and self-awareness of individuals who aspire towards professional sports. These advances make use of wearables a common place for athletes. However, less is known about the effect of wearables on the athletes' identity, which may be important for understanding the way high school athletes may balance their academic and sporting activities.

The formation of the athletic identity during adolescence is crucial. High school athletes reported five key demands; (1) to achieve a work-life balance between sport and other life goals, (2) to find one's individual path in sport, (3) to handle the pressures of selections, (4) to acquire prestige from peers, judges, and others involved in the sport, and (5) to cope with potential relationship problems [13]. Management of these demands can lead to anxiety and worry because there is a high level of uncertainty in the future of the athlete's career. Earlier research has indicated that coping strategies used by athletes were effective through 'choice of coping strategy' and 'automaticity' [14]. Self-quantifiers can select the information they have available to them, thus making the appropriate choice of coping strategies more effective based on the information available.

When athletes associate their roles as athletes, they may be more committed to training and focus more on sport goals. However, too strong athletic identity can also lead to dependency on performance outcomes [15], which may lead to sport termination. QS influences adolescent's understanding of values that sport can offer and extend to the way individuals define themselves, that is, the individuals' concept of self. The theory of self-construal [16] could help explain how the athletic identity goes beyond the themes previously hypothesized by Brewer, Van Raalte, and Linder [15], which included 'exclusivity', 'negative affectivity', and 'social identity'. The self-construal can help in distinct ways people understand themselves in their social context [17]. Self-construalism takes place among athletes where they organise their behaviour based on their own thoughts, feelings, and actions, rather than on others [18], and at the same time identify themselves within a group, as athletes.

1.1. Human Computer Interfaces and Athletes. Mobile application usage in relation to sport allows the athletes to quantify their own training and monitor their performance as well as the possibility of sharing them with others. Applications like Google Fit, Apple Health app, and other downloadable apps may ease the experience to start tracking individual activity. Adolescents can capture the time of activity through self-input, automated registered through phone components, or both, and the results can be shared to their closed or wider social networks. These latter features are linked with athletic identity concepts, specifically the domains of socialisation and feedback. Specific athlete centred programs can be designed to meet specific personalised goals. One such example is the growth in professional personal analysts hired to improve performance outcomes [4]. As the data becomes specific to sport and performances, there could be a tendency for the athletes to instil such knowledge into their identity as an athlete.

In Finland, over half of the adolescents own apps on their phones that track physical activity; however, only one in six actually reported to use them. Moreover, in terms of sports watches and heart rate monitors, a quarter of adolescents aged between 11 and 15 own them, and only ten percent reported to actually use them [19]. In the United Kingdom, few adolescents value the use of wearables for promotion of physical activity as the primary market has been intended for adults [20]. However, there is a place for wearables, because in Finland, the ownership and usage of wearables were more strongly associated with individuals who reported to meet physical activity recommendations [19]. These preliminary investigations were limited to young adolescents, and information about sport specialisation was missing in the analysis by Ng and colleagues.

Heart rate monitors or sports watches are able to capture data when the phone is not close enough to pick up the physical activity measurements. Studies have described the importance of comfort over reliability among adolescents [1]. It is not known if high school athletes question the reliability as much as it is done in scientific research. For example, there are criticisms of such tools to measure physical activity because there are uncertainties in the degree of accuracy that can really improve lifestyles [21]. Despite its scientific flaws, athletes who choose to rely upon devices for self-quantifying can strengthen their identity with the data they have. The data from the wearables can be shared with the coach and family members to assist with training and competition schedules to balance the critical moments of development in sport and academic achievements.

1.2. Purpose of the Study. Given the paucity of literature on the athletic digital natives' use of quantified self, we intend to use this paper as an exploratory study into the associations between athletic identity and professional sport aspiration, with wearables mediating this relationship. More specifically, we examine whether wearables would enhance the athletic identity of high school athletes, particularly in athletes with aspirations for professional sport (Figure 1). It is very likely that certain athletic characteristics may be confounders to these associations, more specifically, the predominant sport type, current sport level, biological sex and,

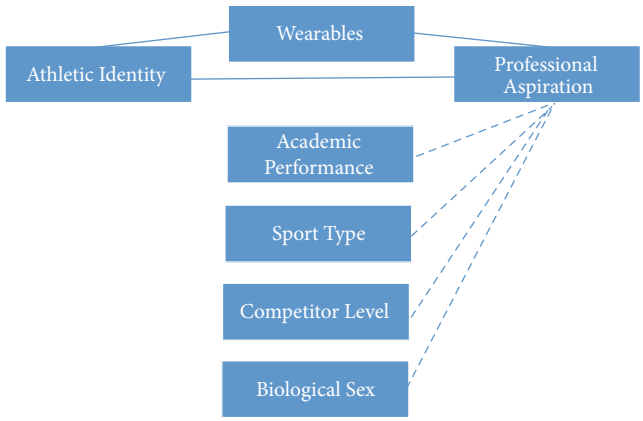

Figure 1: Mediation model of wearables in the relationship between athletic identity and professional aspiration, with athletic performance, sport type, and competitor level as covariates.

because these athletes are still in high school, their academic performance.

2. Materials and Methods

2.1. Participants. The study was approved by the University of Jyvaskyla's Ethical committee. Second-year adolescents of elite sport upper secondary school (age = 17y) were recruited to take part in this study. Seven of the possible 13 upper secondary schools with sports specialisations (in Finnish, urheilulukio) from the South, North, and Central Finland were randomly selected. A total of 490 adolescents took part in the study. A web-based questionnaire was completed during school hours in a classroom in March 2017, with the purpose of collecting data on adolescents' development [22]. Survey completion was conducted voluntarily, whereby students could miss certain questions or end the questionnaire when they desired. For the purposes of this study, 102 adolescents had missing data (total cases; physical activity wearables questionnaire; n = 50, gender; n = 3, professional aspirations; n = 74) with the largest sample size of n = 437. To maximise population statistics, cases were only removed for specific analyses.

2.2. Measures

2.2.1. Athletic Identity. The athletic identity measure scale (AIMS) is a 10-item scale encompassing social, cognitive, and affective elements of athletic identity [15]. Each item has a seven-point Likert scale with extremities of 'strongly disagree' and 'strongly agree'. A global sum score of all items has been demonstrated to have adequate internal consistency (Cronbach's alpha = 0.93) for a unidimensional construct and suitable test-retest reliability (r = 0.89) [15]. In this study, the reliability of the scale was slightly lower, but acceptable [23] with Cronbach's alpha = 0.79. The scores were summed when used as a measure of overall athletic identity.

2.2.2. Physical Activity Wearables. Physical activity wearables (PAW) included one item about heart rate monitors or sport watches (HRM) and one item about mobile phone applications (apps) for physical activity tracking. Both items had response options of (1) "do not have", (2) "do have but do not use", and (3) "do have and use". Volunteers from the survey took part in focus groups to test the face validity of this item. Following the focus group, there was 100% agreement that responses would not have changed, therefore confirming its face validity. Therefore, the groups classification were (1) nonowner, (2) owner, and (3) user.

2.2.3. Professional Aspirations. A single item was used to measure developing athletes' aspirations. The question wording was "Are you aiming to become a professional athlete?" with response options of "yes" and "no". Coding of this variables was dichotomised, with 'no' as the reference category.

2.2.4. Other Possible Confounders. Potential confounders to the associations included gender, sport type, competition level, and academic performance. Gender, a background variable, was used to determine the sex of the athlete. Athletes provided information about their main sport and this was grouped into individual sports or team sports. Individuals reported their competition level and were grouped into national level athlete, European level, or world level. The reference category was 'national level'. Academic performance was measured by athletes' reporting their previous school year grade point average (GPA). Low GPA (lower than 7), between 7 and 8 and between 8 and 9, and high GPA (above 9 out of 10) groups were formed. The reference category was 'low GPA'.

2.3. Statistical Methods. Descriptive statistics were performed to report the ownership and usage of PAWS among the athletes. Chi-square tests test proportion differences in the background variables of gender and sport type. Separate analysis of variance (ANOVA) tests with post hoc tests was conducted to test the differences in means between nonowner, owner, and user of (1) phone apps and (2) fitness trackers.

Multiple binary logistic regressions were performed with professional sport aspiration as the dependent variable. The basic model was tested with athletic identity as a continuous variable, gender (with females as the reference category), GPA (with less than 7 as reference category), competition level (with national as the reference category), and type of sport (with individual sports as the reference category). Three mediated models were used, one for apps, one for fitness trackers, and one for both apps and fitness trackers. Nagelkerke R^2 was used to determine the approximate goodness of fit models, and 95% confidence intervals (CI) of the adjusted odds ratio (OR) were used to determine the level of significance and the effect of the associations.

3. Results

There were the same number of females (n = 218) and males (n = 219), and a few more team sport (n = 230)

Table 1: Sample characteristics (%) and chi-square test of independence.

	Apps				Fitness Tracker			
	None	Own	Use	p	None	Own	Use	p
	N = 157	N = 220	N = 63		N = 153	N = 150	N = 137	
Sex				.685				.036
Female	48.4	49.5	54.8		41.4	54.7	54.1	
Male	51.6	50.5	45.2		58.6	45.3	45.9	
Sport				.036				<.001
Individual	55.5	42.3	44.3		37.5	41.3	64.9	
Team	44.5	57.7	55.7		62.5	58.7	35.1	
Level				.829				.301
National	48.2	43.4	46.2		43.5	43.2	50.0	
European	38.1	38.9	40.4		43.5	36.4	36.5	
World	13.7	17.7	13.5		13.0	20.5	13.5	
Academic				.026				.050
GPA mean	8.17	7.93	7.89		7.87	8.07	8.11	
GPA SD	.88	.90	1.06		.86	.92	.98	
Aspiration				.014				<.001
Professional	48.3	62.0	66.1		41.7	59.3	72.4	
Non-professional	51.7	38.0	33.9		58.3	40.7	27.6	
	35.7%	50.0%	14.3%		34.7%	34.1%	31.1%	

than individual sport (n = 206) athletes (Table 1). However, there were significantly more females who own and use fitness trackers than males (p = .036). In addition, there were significantly more athletes in team sports who have and use apps for tracking fitness than athletes from individual sports (p = .036). However, fitness trackers were significantly more common among individual sport athletes than in team sports to the extent that twice as many fitness trackers users were from individual sports athletes compared with athletes in team sports. Just over a third of the athletes did not have either apps (35.7%) or fitness trackers (34.7%); however the distribution between ownership and usage differed between apps and fitness trackers. Almost half of the athletes with fitness trackers (47.7%) reported to use them, whereas fewer owners (22.2%) reported to use apps. Almost half of the athletes (44.7%) reported to own or use both apps or fitness trackers, with over half of athletes (57.3%) who do not own apps reported to use fitness trackers and similar proportions of athletes (56.2%) who reported they did not have a fitness tracker, but owned or used apps.

3.1. Professional Sport Aspirations. In Table 2 there are column percentages of athletes who aspire for professional and nonprofessional career in sport. Almost two-thirds of adolescents who have aspirations for professional sports were males (61.1%), whereas the majority of female athletes were without this aspiration (63.8%). Furthermore, a greater proportion of professional aspiring athletes had academic grades of 8 and less (46.3%), when compared with athletes without this aspiration (30.7%). For both athletes who aspired for professional and nonprofessional sport, the proportions remained the same for competition level and whether they were involved in individual or team based sports. For both apps and fitness trackers, the proportions of professional aspiring athletes were greater for owning and usage when compared with nonowners.

There were strong associations (Table 3) between professional sport aspiration and athletic identity (OR = 3.28, CI = 2.37-4.55) as well as gender (OR = 3.14, CI = 1.93-5.09). When compared with the lowest grade (less than 7), athletes with the highest grades (over 9) were less likely to have professional sport aspirations (OR = 0.31, CI = 0.11-0.88). Neither competition level nor sport type was significantly associated with professional sport aspiration.

3.2. Phone Apps. Athletes who reported ownership (M = 5.17, SD = .81) had significantly greater athletic identity (p = .015) than nonowners (M = 4.92, SD = .89) of apps (Table 4). This result was particularly pronounced in the AIMS negative affectivity subscale and was not evident in either the exclusivity or the social identity subscales.

Ownership and usage of phone apps were not associated with professional aspirations, although the regression model improved from Nagelkerke $R^2 = 0.30$ in the null model to $R^2 = 0.31$ in the model with the apps included. After controlling for apps, the estimate for athletic identity was slightly lower, yet for gender it was greater than in the null model.

3.3. Fitness Trackers. The differences in athletic identity were more noticeable between users (M = 5.31, SD = 0.76), owners (M = 5.09, SD = .075), and nonowners (M = 4.81, SD = 0.93) of fitness trackers (p < .001). In the social identity (p < .001), exclusivity (p = .008), and negative affectivity (p = .033),

Table 2: Proportions (in %) of professional aspiring athletes by demographics.

	Not Professional (n = 175)	Professional (n = 238)	Total (n = 413)	χ^2	p
Sex				24.94	<.001
Female	63.8	38.9	49.4		
Male	36.2	61.1	50.6		
GPA				14.85	.002
-7	5.1	11.8	9.0		
7-8	24.6	34.5	30.3		
8-9	46.3	39.9	42.6		
9+	24.0	13.9	18.2		
Level				1.75	.418
National	41.7	48.3	45.6		
European	42.3	36.6	39.0		
World	16.0	15.1	15.4		
Sport				3.51	0.061
Individual	52.9	43.6	47.5		
Team	47.1	56.4	52.5		
Apps				8.56	0.014
None	44.0	30.3	36.1		
Own	45.1	54.2	50.4		
Use	10.9	15.5	13.6		
Trackers				26.51	<.001
None	46.3	24.4	33.7		
Own	32.6	34.9	33.9		
Use	21.1	40.8	32.4		

Table 3: Binary logistic regressions of sport aspiration with phone apps and fitness trackers.

		OR	LCI	UCI	OR	LCI	UCI	OR	LCI	UCI	OR	LCI	UCI
AIMS		3.28	2.37	4.55	3.18	2.30	4.40	2.90	2.07	4.05	2.85	2.03	3.99
Sex													
	Female	REF			REF			REF			REF		
	Male	3.14	1.93	5.09	3.23	1.99	5.28	3.69	2.22	6.14	3.77	2.26	6.30
GPA													
	-7	REF			REF			REF			REF		
	7-8	0.78	0.29	2.08	0.83	0.31	2.25	0.68	0.25	1.89	0.72	0.26	2.03
	8-9	0.49	0.19	1.29	0.54	0.20	1.43	0.43	0.16	1.16	0.46	0.17	1.26
	9+	0.31	0.11	0.88	0.33	0.12	0.95	0.23	0.08	0.68	0.25	0.08	0.73
Levels													
	National	REF			REF			REF			REF		
	European	0.71	0.42	1.21	0.71	0.42	1.20	0.83	0.48	1.43	0.82	0.47	1.43
	Worlds	1.08	0.54	2.17	1.04	0.52	2.10	1.13	0.55	2.31	1.10	0.53	2.27
Sport													
	Individual	REF			REF			REF			REF		
	Team	1.29	0.80	2.07	1.21	0.75	1.96	1.68	1.01	2.81	1.60	0.95	2.68
Apps													
	None				REF						REF		
	Own				1.50	0.90	2.50				1.31	0.77	2.23
	Use				2.12	0.99	4.53				1.63	0.73	3.65
Trackers													
	None							REF			REF		
	Own							2.69	1.49	4.85	2.61	1.44	4.73
	Use							4.36	2.28	8.33	4.04	2.09	7.81
Nagelkerke R^2		0.301			0.313			0.360			0.365		

OR: Adjusted Odds Ratio, LCI: lower 95% confidence interval, UCI: upper 95% confidence interval, and REF: reference category.

Table 4: Mean scores of athletic identity of apps and fitness tracker users.

	Apps				Fitness Tracker			
	None	Own	Use	ANOVA	None	Own	Use	ANOVA
	N = 157	N = 220	N = 63	p	N = 153	N = 150	N = 137	p
AIMS	4.91	5.17†	5.10	.020	4.81	5.09†	5.31‡	<.001
Social	5.77	5.88	5.90	.461	5.61	5.90†	6.04‡	<.001
Exclusivity	3.25	3.57	3.56	.062	3.24	3.40	3.73‡	<.009
Negative Affectivity	4.62	5.00†	4.48	.005	4.58	4.83	4.99‡	.041

†Post hoc test between unused and none <.05. ‡Post hoc test between use and none <.05.

users of fitness trackers had significantly higher scores than nonowners.

The association between fitness trackers ownership and professional aspirations was positive (OR = 2.69, CI = 1.49-4.85) when compared with athletes who did not have fitness trackers. A stronger association was between fitness tracker users (OR = 4.36, CI=2.28-8.33) and professional sport aspiration compared to athletes without fitness trackers. The effect of athletic identity was reduced from the null model, although there is a stronger association with gender. In addition, athletes in team sports were positively associated with professional aspirations (OR = 1.68, CI = 1.01-2.81) when compared with individual sport athletes. Nagelkerke R^2 = .360 was stronger than the null model.

The final model included both apps and fitness trackers, and the model was slightly improved (Nagelkerke R^2 = 0.365). The strength of the associations for professional sport aspiration with fitness trackers was still positive for owners (OR = 2.6, CI = 1.44-4.73) and users (OR = 4.04, CI = 2.09-7.81) when compared with athletes without fitness trackers, but slightly less. The adjusted odds were also lower for athletic identity but increased for gender, and sport type was no longer significantly associated with professional sport aspiration.

4. Discussion

According to the results of this study, the majority of high school athletes have apps, fitness trackers, or both and over half had aspirations for professional sport. Ownership and use of fitness trackers were also associated with increased athletic identity and each of its subdomains. Finally, fitness trackers, athletic identity, gender, academic performance, and type of sports were predictors for professional sport aspirations, whereas the associations with apps were not significant.

4.1. PAWS Prevalence. The proportions of apps and fitness trackers ownership were much higher than previously indicated from studies of the general population [19]. This was expected for a number of reasons. The first concerns the sample from this study, whereby in this study, developing athletes were only included, whereas previous studies have been designed to include the general population [1]. Another possible reason is that the data were collected in more recent times. With increasing types of apps, there are more opportunities for adolescents to express themselves through social media and thus reinforce the identity. The number of followers in a social media account can turn an individual into a minicelebrity and the identity that is associated with that [24]. Technology in sports is a fast growing field, which enables more products to be more affordable and provides more purposeful human computer interactions. In addition, a third consideration is the average age of athletes being in the late teens. Ng and colleagues [19] noticed stronger associations in use of apps and fitness trackers with age, and as adolescents get older, they become more competent with existing products that have been designed for adults, thus increasing the appeal to use apps and fitness trackers.

4.2. Trackers and Athletic Identity. There was a positive association between owning a fitness tracker and athletic identity. This was most pronounced in the athletic identity social domain and unclear in the exclusivity and negative affectivity subdomains. However, fitness trackers users had the highest level of athletic identity and this was significant in subdomains too, when compared with athletes without fitness trackers. This was also expected, because the use of fitness trackers are associated with being fit among adolescents [25]. Data ownership from the quantified self allows the athletes to change their own behaviours and could then be shared with others [26]. It is suggested that trackers are a product which can be associated with sports equipment and is used to help improve sport performance. Since trackers provide real time as well as postperformance data, the information forms a source of feedback and has the potential to change training practices, competition performances, and improved performance, if used in the right way [8]. The potential to share quantifiable data to provide reasons for the poor performances needs further investigations as such social activities may become a protective factor against burnout.

Owning apps were also associated with athletic identity, but not for users of apps. More specifically, there was a higher negative affectivity score among owners when compared with athletes without apps. In the face validity focus groups, some athletes felt that apps were not appropriate for the serious athletes. Although the purpose of the study was not to analyse the details from the focus group data, interpretation of this response suggests that there are divides among users of technology. Within smartphones, there are many sensors

which the apps can convert into information used by the athlete, yet making it coherent and purposeful for the user can be challenging [27]. Data presented by the majority of free apps were used to provide health promotion goals and do not seem to be valued by youth [20], suggesting that more tailored user experiences for young people in physical activity and competitive sport apps are needed. Moreover, it has been pointed out that adults who traditionally provide support for adolescents such as parents and coaches need better awareness for how apps can be useful for athletes [28].

4.3. Professional Sport Aspirations. Athletic identity and gender were two strong predictors for professional sport aspirations. According to the binary logistic models, as athletic identity increased, the stronger are the odds of selecting an athlete with professional aspirations. In addition, more males had professional aspirations than females, and as the variables from PAWS were entered into the model, the odds increased when compared with females. This may have been due to the fact that the females in this study had higher athletic identity than males, but fewer females had professional sport aspirations. In addition, athletes with the highest academic grades (above 9) were less likely to have professional aspirations than athletes with the lowest academic (below 7) grades. These findings may be explained through a number of studies that have examined athletic identity.

From previous research, the identity of student athletes impacted their career decision-making and future plans; that is, a high level of athlete identity was associated with a tendency to choose careers in sport [29], lower academic aspirations and efficacy [30], and difficulties balancing other life roles [31]. Moreover, female athletes showed higher levels of identification with the student role when compared with male athletes [30] and higher academic motivation [32] that might be explained with the limited professional sport opportunities for women. On the contrary, male athletes with a higher athletic identity, especially in high revenue sports, tend to have lower GPAs [33].

Fitness trackers variable was strongly associated with professional sport aspirations. In addition, the fit of the model improved from the null model. Athletes who want to use an advantage over their rivals can use fitness trackers to give personalised training and planning knowledge [9]. Moreover, to improve performance in professional sports, technology is constantly used [11]. The commonality of trackers has recently reached the information sharing with spectators in some professional sports [6]. Sensors have become a part of the competition. For example, in the 2017 Beach Volleyball World Tour, athletes used a sensor that the media used to report calories burnt during a phase in the game with the number of jumps they had performed. These additions have made trackers use as part of the equipment and also the identity of the athlete. This cause issues not only surrounding ownership of data [12], but also the need for athletes to practice and compete in their sports with technology as an extra peripheral.

4.4. Limitations and Strengths. There are some important study limitations to consider by the reader. First and foremost, this study is an exploratory study; therefore there would be many things that could be done better once more studies can help drive study hypotheses. In this study, we have not been able to go into detail about how trackers and apps were used, and it would be important to gather this information, perhaps through qualitative inquiry. Particular details about how coach and athletes may communicate with each other based on the objective and subjective feedback from training and competition are other potential areas for future research. Another limitation to the study was its cross-sectional nature, thus an infeasibility to discuss cause and effect. The study was lacking some of the specificity, such as current use, commonly used features, history of the use of PAWS, the social environment, social economic status, human computer interaction, and how that may benefit or hinder athleticism. Other variables to describe some lifestyle management and psychological variables that influence athletic identity were not included due to space in the questionnaire. It has been an important decision to balance the holistic perspective of high school athletes and the amount of questions that can be answered in a survey. The strength of the study was that the data collection was from sport schools around the country and represents a national overview of high school athletes; however generalisability may be extended only to the Finnish context. Similar studies in different countries would be important when extending the constructs presented in this paper. In addition, the measures were limited to professional sport aspirations, and it would be important to know how these aspirations turn out in reality by follow up data.

5. Conclusions

High school athletes in Finland do use apps and trackers and this is associated with their athletic identity. Fitness trackers may be more useful for professional sports as it can provide live and postperformance data that can give an added advantage over people without this type of data. Coaches may need to take this data into consideration when planning short, medium, and long term training schedules and training plans. For professional aspiring athletes, wearables have the potential to help provide data to support suitable training and competition schedules, which is important as the students may be overloaded with academic pressures.

Data Availability

The data used to support the findings of this study are available from the second author upon request.

Conflicts of Interest

The authors have no conflicts of interest.

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