Developmental Practice Activities of Youth Soccer Players

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Abstract: The aim of this study was to identify and compare the developmental pathway between elite and non-elite youth soccer players. 30 elite players from state team and 30 non-elite players from university team participated in this study. The Participation History Questionnaire (PHQ) was used to determine soccer related activities undertaken by the athletes throughout their career. There were significant differences at certain age milestones (age first started to play soccer; started training; started to compete). The elite players accumulated significant differences on types of activities at age range 13-15 years and 16-22 years while for non-elite group showed a significant difference at types of activities at all age range (6-12, 13-15 and 16-22). The elite players participated in less other-sports than the non-elite soccer players. In conclusion, the elite players followed the early specialisation pathway by concentrating on soccer and significantly increased their structured soccer related activities from 16 years onwards. The non-elite players followed the early diversification pathway but did not attain the level as the elites in adulthood. Future investigation on the microstructure of the soccer activities is suggested to examine how these players engaged in those activities.

Keywords: expertise, youth soccer, practice history, specialisation

1   INTRODUCTION

The development of youth athletes into elite adult soccer players is the main goal of each professional clubs, governing bodies, private academies and also coaches and supporting staff [1]. In addition, developing an athlete requires the implementation of good discipline, hard work and commitment towards the athlete related sport and having specific pathways before they achieve the expert performance level. In a broader perspective, one of the elements in developing an elite athlete is the activities and pathway that they engaged in during their childhood period. These are divided into two, namely early specialization and diversification pathway [2]. The pathways are based on the Developmental Model of Sport Participation (DMSP) (see Figure 1) [3, 4].
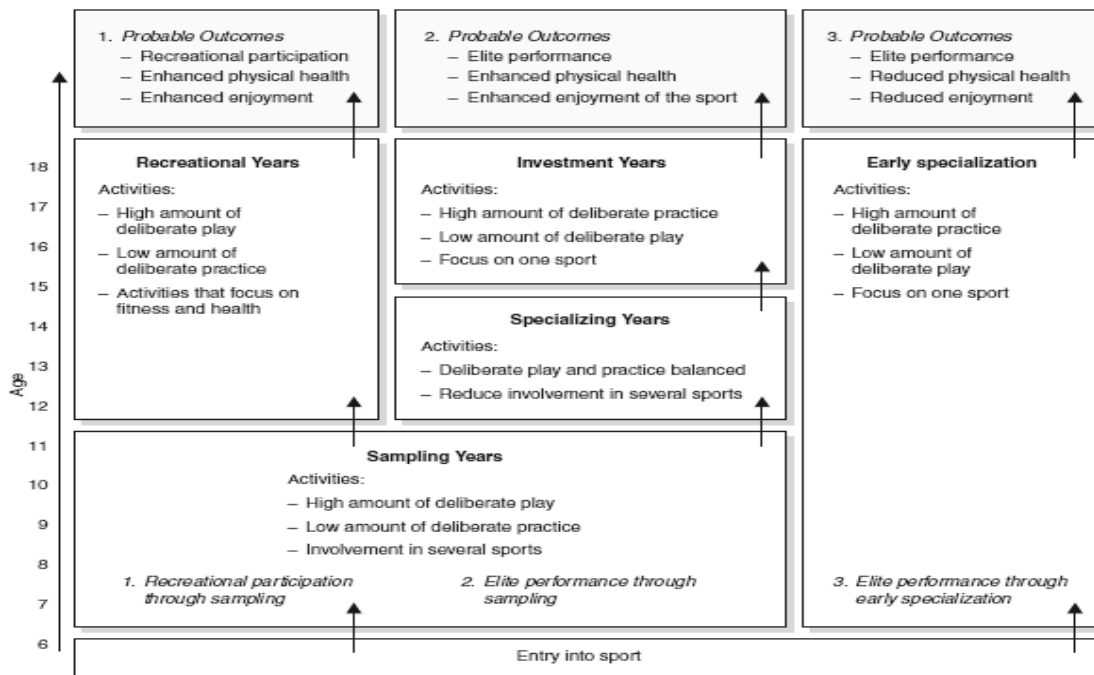
Figure 1: The Developmental Model of Sport Participation (DMSP) adopted from Côté, Baker and

Abernethy (2003; 2007)

Referring to the DMSP, in order to become elite performers, athletes should involve in high amount of deliberate practice, low amount of deliberate play and focusing only to one sport in early specialization pathway. In addition, the involvement in only one sport from the early age of participation (deliberate practice) is originating from the deliberate practice framework and the relationship occur between deliberate practices activities that engaged in with the primary purpose for enhancing performance [5]. Early age involvement in a single sport which also can be referred to a popular '10-year rule" also known as 10,000 hours or 10 years of purposeful and incremental focus on training and development before achieving elite performers [6].

The DMSP also showed that to be an elite performer, athletes can follow the second pathway known as early diversification pathway. Through this pathway athletes have to undergo three phases of years that are sampling years between 6-12 years of age, specializing years (from 13-15 years of age) and investment years (from 16 years of age and above) before they reach elite level. During sampling years athlete will spend more hours on deliberate play, less hours in deliberate practice and play activities with additional of multiples sports involvement [2]. Moving into the specializing years, the engagement in deliberate play and deliberate practice is similar while participation in other sports reduced. Lastly at the investment years phase, athletes will start to engage more in deliberate practice, a lesser amount in deliberate play and focusing only in single sport which was similar in early specialization pathway.

To the best of our knowledge, the debate is still continuing on determining which pathway is the best in developing the elite athlete. The study on Malaysian youth badminton players [7] and elite youth swimmers [8] confirmed followed early specialization pathway. In line with that, [1] study on elite under-16 soccer players from Brazil, England, France, Ghana, Mexico, Portugal and Sweden also to follow early specialization pathway. In contrast, find-

ings by [9] on volleyball club players in Portugal tend to follow early diversification pathway as they participated in various sports during their early age. Similarly, [10] found that youth hockey players follow the early diversification pathway as they started to focus on a single sport only after the age of 13 (specializing years). Therefore, the aim of this study is to identify and compare the developmental pathway (age milestones, soccer-related activities and other sports participation) between elite and non-elite youth soccer players.

2 RESEARCH METHODS

2.1 Participants

Two groups of elite soccer players (N = 60) aged 18-22 years of age participated in this study. The elite soccer players (n=30) represented state team who played in President Cup while the non-elite soccer players (n=30) represented their university team. The mean age for elite soccer players was 19.8, SD = ± 0.85) and for non-elite was 20.2 years of age, SD = ± 1.13).

2.2 Instrument

The Participation History Questionnaire (PHQ) [10] was adapted in order to meet the demand with soccer related activities undertaken by the athletes throughout their career. The PHQ was found to be valid and reliable [11, 12, 13].

The questionnaire contained four sections where the first section is to collect the data that related with soccer-specific milestones. Participants were asked to write down their age on their first started to play soccer (not in a systematic structure), age when they started to train (monitoring by adults), age when they started to train regularly, age when they started to compete at competitive level (club/state/national/international), age when they started to train regularly in order to improve performance (e.g. jogging, gymnasium, resistance training), age when they had been selected into the state sports school, age when they were selected into the national sports schools, age when they started to represent for state team, and age when they started to represent for Malaysia.

For the second section, the questionnaire focused on the involvement with the soccer-related activities. This study highlighted 4 soccer-related that are competition (organized competition), coach-led practice (training conducted/led by coaches/trainers), individual practice (self-training) and peer-led play (activities with peers). Participants had write down the number of hours per weeks and the number of months per year that they were involved in soccer-related activities. They also provide the number of weeks per year that they were injured or unable to involve during the activities. This information started from their present year of playing soccer and moving backwards progressively towards the year that they first started playing soccer. For the third section, participants had provided the information on their involvement in other sport activities. Participants had been provided with a list of sports (with additional space to add the not listed sport) and recorded other sport activities that they have engaged in for at least minimum of three months period.

In the last section, participants had fill in the other related information such as height, weight and others. They also been asked on how they started to get involved in this sport, why they have chosen this sport, what motivated them to compete in this sport, what assisted

their development as an athlete to be at their current level and what were the most challenging circumstances that they had to face as an athlete.

2.3   Procedure

Each soccer player had involve in-details of semi-structured interview based on the [14] retrospective recall methodology, which was intended to assess the sport-related practice history of elite athletes. This method was based on the assumption that the participants would be more precise, accurate and consistent when answering questions based on recalling from past experiences rather than being asked about general questions. Participants are completely finished finish answering the questionnaire within 45 – 90 minutes. Any doubtful and unclear answers had been clarified back from the players, the coaches/teachers and their parents.

2.3   Data Analysis

Data from the PHQ of both groups were analysed. The soccer-specific milestones and mean total of soccer-practice hours of the elite and non-elite soccer were compared using Independent Sample T-tests. Hours engaged in competition, coach-led practice and individual practice were combined into structured activity while peer-led play was categorized as unstructured activity. The data were analysed separately for the 6 -12 years of age (sampling years), 13-15 years of age (specializing years) and 16 – 22 years of age (investment years) with 2 groups (elite and non-elite) x 2 types of activities (structured and unstructured) by using ANOVAs with repeated measures on the last factor. Mann-Whitney U test was used to compare the number of other-sports participated by the two groups. All statistical tests were conducted using the Statistical Package for the Social Sciences (version 25). The alpha level required for significance for all tests was set at $p < .05$.

3.0   RESULTS AND DISCUSSION

3.1   Age Milestones

As shown in Figure 2, there was a significant difference in soccer related activities between elite and non-elite in at age on their first started to play soccer (not in a systematic structure) where non-elite started early ($\mu = 7.27$ years of age, SD = ± 2..08) compared to elite ($\mu = 9.3$ years of age, SD = ± 3.58), t (47) = 2.69, p = .01 < .05, age when they started to train (monitoring by adults), where non-elite started early ($\mu = 9.53$ years of age, SD = ± 1.76) compared to elite ($\mu = 11.2$ years of age, SD = ± 3.47), t (43) = 2.35, p = .024, < .05, age when they started to train regularly, where non-elite started early ($\mu = 11.3$ years of age, SD = ± 1.8) compared to elite ($\mu = 12.77$ years of age, SD = ± 3.21), t (46) = 2.2, p = .034, < .05 and age when they started to compete at competitive level (club/state/national/international), where non-elite started early ($\mu = 10.2$ years of age, SD = ± 1.92) compared to elite ($\mu = 11.8$ years of age, SD = ± 3.41), t (46) = 2.24, p = .03, < .05. In contrast, there was no significant difference in soccer related activities between elite and non-elite at age when they started train regularly in order to improve performance (e.g. jogging, gymnasium, resistance training) as non-elite ($\mu = 13.73$ years of age, SD = ± 2.4) compared to elite ($\mu = 13.10$ years of age, SD = ± 4.5) with t (58) = -.536, p = .594, > .05.

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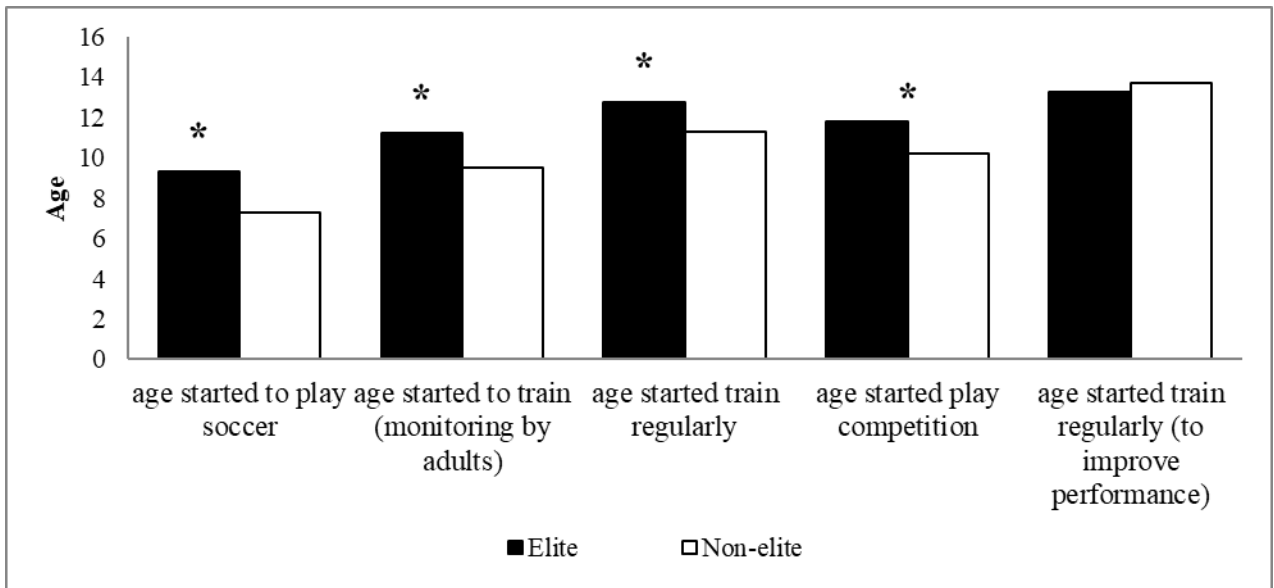
Significance level had been set p < .05

Figure 2: Age Milestone for Soccer Related Activities

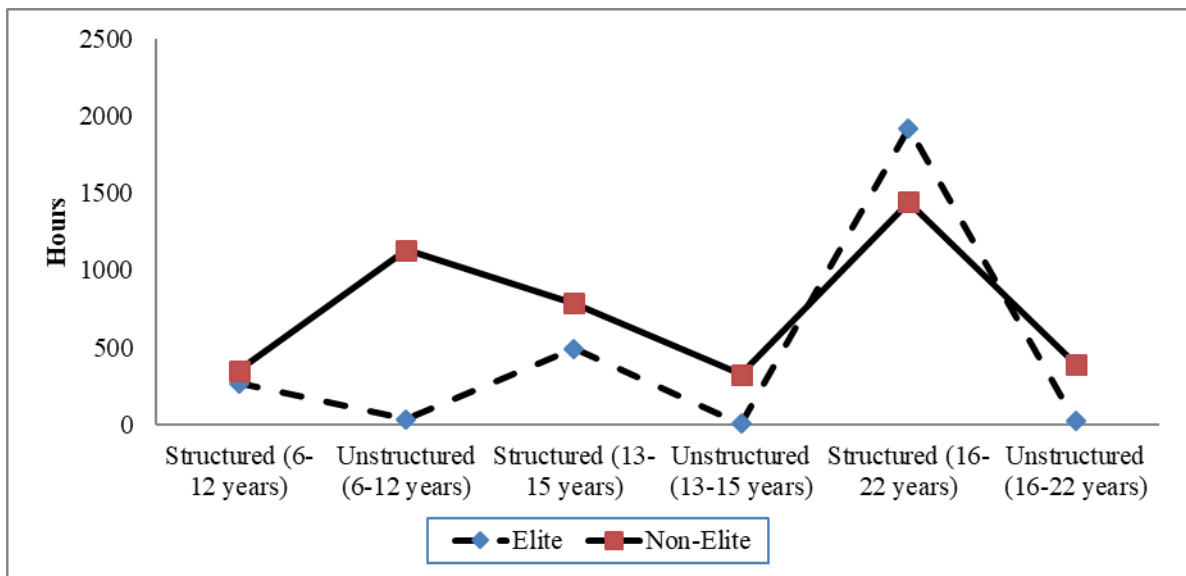## 3.2   Hours accumulated in Soccer

Figure 3: Hours accumulated in structured and unstructured soccer related activities between elite   and non-elite players according to age range.

Figure 3 shows the average accumulated hours for soccer related activities of engagement in structured and unstructured activities as a function in age range (e.g. 6-12, 13-15 and 16-22 years of age) between elite and non-elite. The comparisons of the hours were analysed using analysis of variance (ANOVA) 2 Groups (Elite vs. Non-Elite) x 2 type of activities (struc-

tured vs. unstructured) at 3 different age range (6-12, 13-15 and 16-22 years of age) with repeated measures on the last two variables.

Table 1: Comparison of hours engaged in structured and unstructured according to age range between   elite and non-elite youth soccer players

Group	Age Range	Activities	Mean	Std. Dev	p < .05
Elite	6 – 12	Structured	265.39	461.63	p = .174
		Unstructured	36.37	1221.36	
	13 – 15	Structured	490.60	1219.79	p = .005*
		Unstructured	5.92	363.17	
	16 – 22	Structured	1919.37	1509.82	p < .001*
		Unstructured	20.57	351.21	
Non-Elite	6 – 12	Structured	348.13	461.63	p < .001*
		Unstructured	1130.13	1221.36	
	13 – 15	Structured	785.49	1219.79	p = .007*
		Unstructured	323.60	363.17	
	16 – 22	Structured	1441.57	1509.82	p < .001*
		Unstructured	390.86	351.21	

There was a significant difference between group, $F(1, 58) = 7.6$, $p = .008$. The average total hours accumulated by non-elite soccer players ($\mu = 4419.76$ hours, SD = ± 2733.87) was more compared to elite soccer players in both structure and unstructured activities ($\mu = 2738.22$ hours, SD = ± 1821.97). There was also a significant effect between types of activities where, $F(1, 58) = 34.65$, ($p <. 001$). Both elite and non-elite group tend to accumulated more on structured activities ($\mu = 875.09$ hours, SD = ± 653.05) compare to unstructured activities ($\mu = 317.91$ hours, SD = ± 390.46). Referring to Table 1, it showed the significant difference in the hours as a function of the age range between structure and unstructured activities. For elite group, there was a significant difference at types of activities at age range 13-15 years of age where $p = .005$. Elite group accumulate more hours at $13 – 15$ years of age in structured activities ($\mu = 490.6$ hours, SD = ± 1219.79) compared to unstructured ($\mu = 5.92$ hours, SD = ± 363.17). There was a significant difference at types of activities at age range 16-22 years of age for elite group ($p <. 001$). Elite group accumulate more hours in $16 – 22$ years of age at structured activities ($\mu = 1919.37$ hours, SD = ± 1509.82) compared to unstructured ($\mu = 20.57$ hours, SD = ± 351.21). Non-elite group showed a significant difference at types of activities at age 6-12 years of age ($p <. 001$). They accumulated more at unstructured activities ($\mu = 1130.13$ hours, SD = ± 1221.36) compared to structured ($\mu = 348.13$ hours, SD = ± 461.63). There was also significantly difference in types of activities at age 13-15 years of age ($p = .007$). Non-elite group tend to accumulate more hours in structured activities at age 13-15 years of age ($\mu = 785.49$ hours, SD = ± 1219.79) compared to unstructured ($\mu = 323.6$ hours, SD = ± 363.17). At age 16-22 also found a significant difference for non-elite at types of activities. They accumulated more hours on structured activities at age 16-22 years of age ($\mu = 1441.57$ hours, SD = ± 1509.82) compared to unstructured ($\mu = 390.86$ hours, SD = ± 351.21).

3.3 Other Sports Participation

From the age of 6 until 22 years of age, there was a significant different in other sport participation between elite (Md = 3, n = 60) and non-elite soccer players (Md = 4, n = 60), U = 275, z = - 2.62, p = .009, r = .34. By referring to the mean rank, non-elite group participated in more other sports compared to the elite players.

The objectives of this study were to identify and compare the developmental pathway (age milestones, soccer-related activities and other sports participation) between elite and non-elite in order to identify the pathways of the youth soccer players. There was statistically differences in age milestone when non-elite athlete tend to start early compared to elite soccer players in age on their first started to play soccer (not in a systematic structure), age when they started to train (monitoring by adults), age when they started to train regularly and lastly the age when they started to compete at competitive level (club/state/national/international). The finding of this study was in line with previous finding by [7] on badminton players where state players had started early in badminton related activities compared to their national counterpart. In the early stages of their development, both groups were expected to follow the Developmental Model of Sport Participation (DMSP) [4].

This study found a significant difference between groups where non-elite group accumulated more soccer related activities compared to elite. Early-age involvement from non-elite group in soccer leads them to accumulate more hours. Previous study finding was also similar by [7] where state badminton players engaged in significantly more hours in both structured and unstructured practice activities compared to the national back-up players. Analysis on type of activities between structured and unstructured as a function of the different age range was conducted in order to determine their developmental pathways as suggested in the DMSP [15, 16].

As predicted, the elite players accumulated more hours in structured activities in age 13-15 years of age and 16-22 years of age compared to unstructured. As being discussed at age milestone, even they engage late compared to non-elite, their frequency of training was higher as being showed at Figure 3 when it dramatically increases when they reach age 16-22 years of age. For the non-elite group, an interesting finding showed that they accumulated more hours on unstructured activities at age 6-12 years of age even though they started to engage early in soccer related activities compared to non-elite. They spend more activities with their peer during their childhood time. However, as their age increase, they started to accumulate more hours on structured activities beginning at age 13
.

Lastly, this study found a significant difference in other sport participation between elite and non-elite soccer players as it showed that non-elite tend to participate more on the other sport compared to elite. The highest number of other sports participation was supported by previous study when soccer players in England engaged in a greater variety of other sports (μ = 4) during childhood compared to the other countries [1]. Since the finding of this study showed that non-elite spend more hours at early age range, the involvement in other sport was related with their greater amount of hours in unstructured activities. In contrast, elite soccer players tend to follow the same finding with previous studies when elite swimmers also participated in low numbers compared to sub-elite swimmers in other sports [3, 17] as they focused to specialise in a specific sport.

3   CONCLUSION

In summary, the elite soccer players spend more time on structured activities at each age range while non-elite, engaged more time on unstructured play during their early age period, and then increased on structured activities as their age increase. Therefore, referring to DMSP model, the elite group followed early specialisation pathway since they accumulate more on structured activity and participated less in other sports. Further studies into the details of specific practice activities that leads to elite performance in sports is suggested. This study concluded that performance measurement can correlated with the amount of hours engaged in structured activities on specific sports. It can be shown, even though non-elite accumulated more hours in soccer related activities, their engagement in structured activities was less. Thus, examination on the microstructure of the soccer activities would reveal in more detailed the activities that contribute to the development of elite soccer players.

4.   ACKNOWLEDGEMENT

5.   REFERENCES

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