

## Description of Paralympic Athletes' Talent Development Environment

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### Original Article

#### Abstract

**Introduction:** The contemporary studies seek to describe the appropriate environments for athletic talent development by changing procedure instead of talent identification, which is a tedious process that sometimes does not yield the desirable result. Accordingly, some studies have described the athletic talent development environment, but only a few studies have described Paralympic athletic talent development environment. Therefore, the aim of the present study was to describe Para-Asian and Paralympic athletic talent development environment.

**Materials and Methods:** The current research was a descriptive-correlational study. The study participants consisted of 150 athletes (46 women and 104 men) who participated in the teenage and youth Para-Asian and Paralympic games between the years 2014-2018. The participants were selected using convenience sampling method. In this study, Talent Development Environment Questionnaire for Sport was used. This questionnaire comprises seven subscales: "long-term development focus", "quality preparation", "communication", "understanding the athlete", "support network", "challenging and supportive environment", and "long-term development fundamentals". The obtained data were analyzed using one-sample t test.

**Results:** The means of the four subscales of "long-term development focus" ( $P = 0.001$ ), "communication" ( $P = 0.001$ ), "challenging and supportive environment" ( $P = 0.001$ ), and "long-term development fundamentals" ( $P = 0.001$ ), were higher than average. The means of the two subscales of "support network" ( $P = 0.450$ ) and "understanding the athlete" ( $P = 0.360$ ) were at a moderate level. The mean of "quality preparation" ( $P = 0.035$ ) was less than average.

**Conclusion:** In talent development environment for athletes with disability, more attention should be paid to providing the athletes with continuous and always-available support of coaching staff as well as services and facilities. Additionally, the coaches should pay more attention to the athlete's physical and mental health; so that the athlete feels his/her health is important to the coach.

**Keywords:** Environment, Talent, Development, Athlete, Disabled

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#### Introduction

Disability is a condition that makes it difficult for individuals to perform their daily tasks. According to the World Health Organization (WHO), disability is defined as the "inability to perform normal and routine activities that stems from an organ impairment" (1). Based on the WHO statistics, about 7 to 10% of the world's population suffer from disabilities, 80% of whom living in developing countries and only 1 to 2% have access to the necessary rehabilitation services (2,3).

Physical activity is one of the most important

strategies to enable the individuals with disabilities. Participation in physical activity improves motor, mental, and social skills and quality of life (QOL) of the disabled. In addition, taking part in championship sports provides the ground for further social participation of these individuals (4).

Successful participation in the championship sports depends on the talent identification (TiD) process. The athletic TiD process involves identifying and selecting talented individuals who have all the physical, skill, and behavioral requirements to succeed in a particular sport field (5). Sports talent

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consists of two stages; the first stage involves the discovery and identification of sports talent and the second stage includes the development of talent, which focuses mainly on the skills acquired by athletes and the quality and quantity of the environment, training, and exercises required to achieve high levels of performance (6). In the talent development process, providing opportunities and support to athletes in order to realize their potential is crucial. According to Mudege, talent development involves providing training, coach guidance, and competition programs along with access to appropriate equipment and facilities (7).

When dealing with the subject of identification and development of athletic talent of individuals with disabilities, it is necessary to note that the development of the athletic talent in individuals with disabilities totally differs from that in the individuals without disabilities in terms of discovery and development, hence the scientific findings, views, and theories developed in the field of exercise for the non-disabled, rarely apply to the exercise of the disabled (8).

Moreover, it is necessary to consider culture-dependent variables such as the structures of the national sports system in the disabled athletic talent identification and development program. The national sport of every country is affected by the political, social, economic, and geographical environment (8). Since the social or cultural factors influence the type of physical activity in which individuals participate, they can act as socio-cultural constraints. The socio-cultural attitudes of individuals in a society encourage or prohibit them to perform certain motor behaviors and are therefore considered as environmental constraints reflecting the general attitude or the existing belief system and to a large extent, are present within certain subcultures. Although these attitudes are by no means obvious, they can dramatically affect the motor behaviors of individuals (9). Investigating the lives of the elite sports heroes, Mshelia stated that cultural norms, religion, and resource allocation can lead to differences in the expertise path (10). In this regard, studies have been carried out to identify the driving and inhibiting factors of sport participation of the disabled in physical activities, with the findings showing that environmental (transport), economic, and socio-cultural factors are among the most important inhibiting factors and vitality, health, and social interaction are among the most important driving factors of participation in the physical activities of these individuals (11,12).

Given the above issues, cultural differences seem to lead to differences in the sport talent development environments that should be taken into account in describing the talent development environments. This limits the application of the results of studies conducted on the talent development environments in some cultures in another culture (13). Furthermore, most of the studies have addressed the talent development environments for the non-disabled individuals. However, the development of the athletic talent in individuals with disabilities totally differs from that in the individuals without disabilities in terms of discovery and development (8). Additionally, the participation of individuals with disabilities in championship sports has increasingly become the focus of political attention and the participation of the elite disabled athletes has increased in international competitions. However, few studies have been accomplished on the disabled professional athletes (8,14,15).

Given the problems of individuals with disabilities in the society in comparison to the healthy people and lack of studies about them, the present study is conducted with the aim to describe the characteristics of the talent developmental environment of the disabled and veteran athletes. This information can serve as a guide for coaches and parents to encourage and guide the disabled.

## Materials and Methods

This was a descriptive-correlational study with the data collected in a cross-sectional manner. The statistical population of the study consisted of 197 disabled athletes participating in the adolescents and youth Asian Para and Paralympic games between 2014 and 2018. The samples were selected by census method. Of the whole population, 31 subjects did not participate in the study and 12 did not complete the questionnaire despite signing the consent form. Moreover, the data of 4 athletes were eliminated due to bias in completing the questionnaire (marking only one of the options in the whole items). Accordingly, the data of 150 athletes (48 girls and 102 boys) participating in 10 sport fields (wheelchair basketball, sitting volleyball, para-athletics, weightlifting, boccia, archery, swimming, table tennis, cycling, and skiing) were examined.

**Talent Development Environment Questionnaire (TDEQ):** This questionnaire was first designed by Martindale et al. (16). The scale consists of 59 items comprising seven subscales, including: "focus on long-term development, qualitative preparation, communication, understanding the athlete, supportive

network, challenging and competitive environment, and long-term development principles". 24 items of the "focus on long-term development" subscale are about goal setting, baseline training, and planning for improvement, 5 items of the "qualitative preparation" subscale about training quality, return to initial state, and competition experience, 7 items of the "communication" subscale on establishing an effective coach-athlete relationship to increase the athlete knowledge and identification of opponents and the competition environment prior to match, 4 items of the "understanding the athlete" subscale on the athlete's negative perception of the coach and manager attention to outside-the-training life and mental health of the athletes, and 8 items of the "supportive network" subscale on continuous, accessible, and permanent support of the coaching staff (technical coach, bodybuilding trainer, and psychologist) and the nutritionist and physiotherapist. Besides, 4 items of the "challenging and competitive environment" subscale examine whether athletes are appropriately challenged and given proper support during these challenges, and finally, 7 items of the "long-term development principles" subscale raise key factors for further development, such as athlete participation in decision-making, avoidance of early specialization, and family support.

The responses to the items were scored on a 6-point Likert scale ranging from 1 to 6 indicating *strongly disagree* to *totally agree*, respectively.

By running the questionnaire on 590 athletes, Martindale et al. confirmed its construct validity and reported a 0.97 Cronbach's alpha coefficient for the whole questionnaire (16). In Iran, Tizro and Badami confirmed the validity and reliability of this questionnaire (17).

After the approval of the study in the Research Council, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran and obtaining the necessary ethical permits (code of ethics IR.IAU.KHUISF.REC.1398.091), the questionnaire was provided to the athletes online. At the beginning of the questionnaire, the athletes specified the type of sport, championship level, age range, and gender.

The data were analyzed using mean and standard deviation (SD) at the level of descriptive statistics and using t-test at the level of inferential statistics to compare the scores obtained by the athletes with the mean score of each subscale. Since the focus on long-term development subscale consisted of 24 items and score on the 6-point Likert scale, the minimum and maximum scores were 24 and 144, respectively, with a mean of 72. Thus, the hypothetical average of the

subscales of qualitative preparation (5 items, minimum and maximum scores of 1 and 30, respectively), communication (7 items, minimum and maximum scores of 7 and 42, respectively), understanding the athlete (4 items, minimum and maximum scores of 4 and 24, respectively), supportive network (8 items, minimum and maximum scores of 8 and 48, respectively), challenging and competitive environment (4 items, minimum and maximum scores of 4 and 24, respectively), long-term development principles (7 items, minimum and maximum scores of 7 and 42, respectively), and total score of talent development environment (59 items, minimum and maximum scores of 59 and 354, respectively), were estimated to be respectively, 15, 21, 12, 24, 12, 21, and 177. Ultimately, the data were analyzed in SPSS software (version 21, IBM Corporation, Armonk, NY, USA).

## Results

The demographic information of the participants are presented in table 1.

**Table 1.** Demographic information of participants

Individual profile	n (%)
Gender	
Female	48 (32)
Male	102 (68)
Education level	
Diploma and lower	51 (34)
Associate degree	18 (12)
bachelor's degree	60 (40)
Master's degree	21 (14)
Type of disability	
Congenital	60 (40)
Polio	27 (18)
Due to an accident	27 (18)
Due to a war	15 (10)
Others	21 (14)

The findings on the talent development environment are presented in table 2. Based on the data in table 2, the mean values of the subscales of focus on long-term development ( $P = 0.001$ ), communication ( $P = 0.001$ ), challenging and competitive environment ( $P = 0.001$ ), long-term development principles ( $P = 0.001$ ), and talent development environment ( $P = 0.001$ ) (with hypothetical means of respectively 72, 21, 12, and 177) were significantly higher than the hypothetical means ( $P < 0.001$ ) and was rated above average, however the mean of the two subscales of understanding the athlete ( $P = 0.360$ ) and supportive network ( $P = 0.450$ ) was at the average level ( $P < 0.050$ ) and the mean of the subscale of qualitative preparation ( $P = 0.035$ ) was evaluated to be lower than average ( $P < 0.050$ ).

**Table 2.** Estimation of the t-test to assess the talent development environment status and its subscales

Variable	Mean $\pm$ SD	df	t	Status
Long-term development focus	100.94 $\pm$ 24.58	49	4.87**	Above average level
Quality preparation	16.18 $\pm$ 4.30	49	-2.16*	Below average level
Communication	29.74 $\pm$ 9.67	49	3.82**	Above average level
Understanding the athlete	13.38 $\pm$ 4.83	49	-0.90	At average level
Support network	27.40 $\pm$ 5.59	49	-0.75	At average level
Challenging and supportive environment	16.24 $\pm$ 3.53	49	4.48**	Above average level
Long-term development fundamentals	29.68 $\pm$ 7.25	49	5.04**	Above average level
Talent development environment	233.56 $\pm$ 45.16	49	4.23**	Above average level

SD: Standard deviation; \* Significant difference at  $P < 0.050$  level, \*\* Significant difference at  $P < 0.001$  level

## Discussion

The present study was carried out to describe the talent developmental environment for Paralympic athletes with disabilities. Based on the results, out of the seven subscales of the talent developmental environment, the mean of four subscales of “focus on long-term development”, “long-term development principles”, “challenging and competitive environment”, and “communication” were above the average level, the mean of the two subscales of “understanding the athlete” and “supportive network” were at the average level, and the mean of the “qualitative preparation” subscale was below the average level.

The “focus on long-term development” subscale refers to the long-term planning for upgrading multiple skills by goal-setting and strengthening basic skills. Given the higher level than the average level of this subscale in the elite disabled athletes, it can be argued that targeting and enhancing basic skills in the talent development environment has been given more attention than the average level. This finding is in line with the results of studies carried out on the talent development environment for the elite athletes (18-20). Based on the investigations, it was found that elite athletes are reared in environments with long-term, purposeful, and coherent plans for improvement. In the same vein, Tan Li San and Low acknowledged that the implementation of coherent and structured programs during increases learning and development of swimming skills among the youth (18). Based on the reports on the level of exercising by the elite athletes, mastery is the result of long-term and systematic exercising effort (19). The results of the study by Firuzi et al. suggested that the lack of long-term planning is one of the most challenging factors in the field of medalist fields (20).

The subscale of “long-term development principles” was also assessed as above average and emphasizes the “athlete participation in decision making”, “avoiding early specialization”, and “family support”.

Regarding the athlete's participation in decision-making, several experts have suggested that it is better for athletes to contribute to the selection of goals and planning to achieve them, as this increases their commitment.

Concerning avoiding early specialization, according to a theory by Cote, to achieve high levels of championship, it is better for individuals to pass through three distinct stages of sampling (childhood at 6 to 12 years of age), specialization (early adolescence at 13-15 years of age), and investment years (late adolescence over 16) (21). Given this model, children in the sampling phase are better to participate in different sport fields in a deliberate play manner (22). Deliberate play refers to playing football in the backyard or basketball in the street, with the age-adjusted rules which are controlled by children or adults involved in the activity. These activities are intrinsically motivating and are designed to increase enjoyment. Cote and Hay acknowledged that in the specialization phase it is better to limit the children's participation in various sports activities and that the exercises at this stage should be appropriate deliberate play and exercise (22). At the last stage, namely investing, most young people are committed to only one sport and mainly focus on the deliberate practice. Accordingly, three testable principles have been proposed based on the Cote and Fraser-Thomas model; on the basis of the first principle, the elite athletes should be involved in different sports during their childhood rather than specializing in one sport. Second, the elite athletes should play more deliberate play in their childhoods than deliberate practice. Third, the elite athletes should continue to participate in one or two sports more seriously and focus more on deliberate practice rather than deliberate play during adolescence and adulthood (23).

Concerning family support, Mills et al. acknowledged that the supportive behaviors of parents, such as trusting the coaches and not improperly interfering in their work, improve children's athletic performance (24). Cote also



concluded that parental support does not directly imply specific exercise or coaching guidelines, but rather the expression of interest and companionship (21). Moreover, Brackenridge stated that without family involvement, many athletes would not be able to continue to participate in their field of study (25). In another study, Dinli and Badami reported that parental support plays an important role in the process of acquisition of expertise in sports, and that the parents' perception and support of them encourage the children to further participate in sports activity and enjoyment (26).

Another finding of the present study showed that the "challenging and competitive environment" subscale was also above the average level. The objective of designing this subscale was to examine the support received by the athlete in challenging situations. In other words, the supportive and at the same time challenging environment means that although practicing and more effort to achieve high levels are necessary, only in combination with the qualitative and supportive process can one achieve higher levels of success. It should be noted that a challenging environment, along with healthy support and the emphasis on victory, leads to lower mental stress, stronger internal motivation, and high desire for progress and is essential for long-term development and success (27).

The higher-than-average level of the supportive challenge environment was in line with the results of the studies by Cote (21) and Tizro and Badami (17). Cote showed that parental emotional support during times of stress plays an important role in children's athletic success (21). Another study confirmed that parental emotional support for their children when they need comfort and safety is essential for success (28). In a study performed by Wolfenden and Holt, parents' emotional support for their children increased when the children had a difficult race ahead or failed in a major race (29). Li et al. (30) and Mills et al. (24) found that parents of successful athletes did not have unrealistic expectations of their children and less insisted on their winning.

The findings of the present study indicated a higher than average level of the "communication" subscale among the elite disabled athletes. This component measures the relationship of the coach with the athlete in formal and informal environments. In this subscale, in particular, the goal setting nature, review and feedback, development planning, and emphasis on progress are considered at higher levels. In this regard, Martindale and Mortimer consider the presence of formal and informal communication

systems necessary to maximize the athlete efficacy (27). Campbell and Jones also stated that ineffective communication causes stress and inefficacy among wheelchair basketball players (31).

Based on the results of the present study, the subscale of "supportive network" was in the average level. The objective of designing of this subscale is to examine the continuous, accessible, and constant support of the athlete by the coach, psychologist, bodybuilding trainer, nutritionist, and physiotherapist. The athletes with disability seem to have received continuous support from coaches (bodybuilding trainer, psychologist, psychiatrist, and physiologist) in the average level. However, at high championship levels, success requires athletes to be adequately supported by coaches (32). Some researchers argue that talented individuals need to be identified at the right time and constantly and consistently supported to achieve high levels of athletic performance (33).

The results of the present study revealed that the "understanding of the athlete" subscale was in the average level. This subscale deals with the athlete's negative perception of the coach and manager attention to outside-the-training life and mental health of the athletes. To succeed at high championship levels, the athlete needs to have a positive understanding of the coach's attention to all issues. Previous studies have highlighted the need for a close relationship between the coach and athlete in the talent development years and following years. For example, a study by Bloom and Sosniak emphasized the complex and inclusive nature of athlete raising as well as the role and effect of the coach in this period (34).

Another finding of the current study indicated that the "qualitative preparation" subscale was rated lower than average among the disabled and veteran elite athletes. This subscale addresses the quality of training, recovery, and racing experience. In other words, this subscale emphasizes clear guidance and suitable opportunities to provide and enhance qualitative practice through training, rehabilitation, and competitive experiences (27). Lower than the average level of this subscale is thinkable because researchers believe that excellent performance results from quantitative and qualitative practice (35). Ericsson et al. pointed out that sufficient high-quality education is necessary to achieve expertise (35). The reason for the lower than average level of this subscale can be attributed to the low knowledge of coaches in working with the disabled individuals and lack of facilities. Based on the results reported in a study, only 16% of the trainers of the athletes with a disability were disabled themselves, and although

being disabled is not necessary to understand them, most disabled coaches had at least experience working with the disabled athletes before working with this community. Furthermore, Paralympic athletes have been concerned about the access to inexpensive and facilities, transportation, and equipment necessary to continue and facilitate the level of preparation needed to compete in the elite stage (36).

Another issue that should be regarded in the qualitative preparation of the talent development environment is to assign time for the players' recovery. In this regard, Kellmann argued that recovery is inseparable from the multifaceted exercise program (37). Additionally, Martindale and Mortimer in a study found that effective physical and mental recovery is needed to keep athletes away from injuries and other psychological consequences such as fatigue and stress (27).

### Limitations

There was no limitations regarding the implementation of the present study.

### Recommendations

In order to succeed in the exercise of the individuals with disabilities, it seems that authorities need to pay more attention to the continuous, accessible, and constant support of the coaching staff (coach, psychologist, bodybuilding trainer, nutritionist, and physiotherapist) as well as the provision of facilities. Coaches must pay more attention to the physical and mental health of the athletes so that they feel that their health is important to the coach. It is suggested that future studies examine the relationship between perceived social support and mental health. The individuals with higher mental health levels may also perceive social support in a higher level. Furthermore, in order to investigate the differences and similarities that may exist in the talent development environment between the disabled and non-disabled individuals, it is suggested to compare the talent environment in these two groups.

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### Conclusion

Overall, the findings of the current study indicated that the mean of the talent development environment variable and subscales of focus on long-term development, long-term development principles, communication, and challenging and competitive environment were above the average level, however the mean of the variables of understanding the athlete and supportive network was in the average level, moreover, the mean of the qualitative preparation was lower than the average level.

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### Authors' Contribution

Sahar Mahmodi: Performing executive services, sample selection and screening, conducting the study, Attracting funding for the study; Rokhsareh Badami: Study design and ideation, performing executive services, sample selection and screening, conducting the study, data analysis, conducting statistical services, manuscript preparation, confirmation and submission of the paper, responsibility for answering; Zohreh Meshkati: conducting the study; Rasol Nazari: conducting the study.

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The present study was derived from a Ph.D. thesis with code of ethics IR.IAU.KHUISF.REC.1398.091, approved by Isfahan (Khorasgan) Branch, Islamic Azad University without financial support. This university did not comment on data collection, analysis, and reporting, manuscript preparation, and final confirmation of the study for publication.

### Conflict of Interests

There is no conflict of interest.

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