Volume 5, issue 1, Feburary 2025 (152-161)
Contents lists available at APSS
Journal of Advances in Para Sport Science (APSS)
Journal homepage: http://apssjournal.com/

ORIGINAL ARTICLE

Psychometric Evaluation of the Mental Talent Identification Questionnaire in Athletes with Physical and Motor Disabilities

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Received: 07-06-2025 Accepted: 10-07-2025 Published: 08-08-2025

ABSTRACT

purpose: This study aimed to assess the validity and reliability of the "Mental Talent Identification Questionnaire for Athletes with Disabilities.This descriptive, cross-sectional survey encompassed 367 athletes (194 women and 173 men) participating in the December 2024 Talent Identification Festival organized by the Sport Federation for the Disabled Persons. Exploratory factor analysis utilizing the principal components approach with varimax rotation was conducted to evaluate validity, and Cronbach's alpha coefficient was applied to ascertain reliability. The KMO index was 0.872, and Bartlett's test yielded a significant result demonstrating the appropriateness of the data for factor analysis. Preliminary exploratory factor analysis identified six components with eigenvalues exceeding one, together accounting for 55% of the total variance. Five principal variables (self-confidence, resilience, Goal Setting, competitive motivation, and commitment) were kept based on factor loadings and statistical criteria. The Cronbach's alpha coefficient for the complete questionnaire was 0.807, indicating satisfactory reliability of the instrument. The findings demonstrate that the Mental Talent Identification Questionnaire for Athletes with Disabilities exhibits suitable psychometric features and can function as a valid and reliable tool for evaluating mental factors pertinent to talent identification in this demographic.

Keywords: Self-confidence, Resilience, Goal Setting, Competitive motivation, Commitment

Introduction

Intense competitions to achieve podium finishes and win medals in global, Olympic, and Paralympic events, along with the exploitation of the cultural, social, economic, and political achievements of these successes, have led governments and sports institutions to invest in identifying and nurturing sports champions. Concurrently, with the increasing importance of competitive sports, sports sciences have facilitated the improvement of athletes' performance and assisted them in competitions. One of the important and influential areas of sports sciences that has played a significant role in enhancing performance levels and setting new records in recent years is sports psychology [1]. With the expansion of sports psychology knowledge, the importance of mental skills in the successful execution of sports skills has received more attention. It is clear that to achieve success in the realm of sports competitions, just as optimal physical readiness is essential, psychological readiness also holds a special place. Although in the past the main focus was on the physical preparation of athletes, today sports psychologists, coaches, and athletes emphasize the necessity of developing mental and psychological readiness as one of the key pillars of sports success [2]. In recent years, studies related to the sports of individuals with disabilities have seen significant growth. Much of this progress has been influenced by changing attitudes and new narratives about the concept of disability. In the past, the dominant view of disability was medical and individualistic; meaning that disability was defined as a problem or deficiency in an individual's body [3]. This approach considered individuals with disabilities as needing specialized intervention and treatment, thereby focusing on individual problems rather than examining social barriers. Since the 1980s, this individualistic perspective has been seriously criticized. Activists such as Oliver, Sapey, and Thomas [4], Oliver and Barnes [5], and Oliver [6] emphasized that the focus should shift from individual deficiencies to social structures and institutions; as it is these social structures that limit the full participation of individuals with disabilities by creating physical, cultural, and social barriers. The broader acceptance of the social model of disability has led to increased attention to the issue of access to sports opportunities for individuals with disabilities. Due to physical limitations and social barriers, individuals with disabilities are often deprived of a decent quality of life and the confidence to actively participate in society. However, these individuals can serve as positive role models, inspiring future generations and demonstrating the will, perseverance, and ability to achieve sporting goals. According to the World Health Organization report [7], about 15% of the world's population lives with some form of disability. Disability is defined as any limitation in fulfilling social roles, in accordance with the cultural and social conditions of each society [8]. Additionally, one of the common consequences of disability is a decreased willingness to participate socially and withdrawal from social activities [9]. Another very important and effective factor in the remarkable and stunning growth of athletes with physical-motor limitations is the timely and scientific identification of their sports talents. The effective and efficient talent identification methods play a significant role in modern sports activities, and countries that use these methods achieve more success in sports arenas than others [10]. Achieving success and superiority is a common goal in professional sports. For this, the personal effort of athletes is very important, but it is not enough. Experienced coaches, high-level teammates and competitors, and access to good sports facilities are other important factors in this path [11]. However, these resources are not available to everyone, and only top-tier and elite teams have access to such facilities. Therefore, the talent identification and selection process becomes important to decide which athletes have the chance to join these elite teams. The definition of "talent" is a highly debated topic in the world of sports. Some believe that talent is the current ability of an individual that places them in the top 10 percent of their age group [12]. Others view talent as the potential ability for future success. However, everyone agrees that talent is

something rare [11]. Discovering future sports stars has always been one of the main goals and motivations for researchers entering the field of sports talent identification. Nevertheless, research in this area faces numerous challenges and complexities [13]. Undoubtedly, overlooking some of the effective components in identifying talented individuals, although it does not completely prevent achieving success, does pose limitations and challenges to the talent identification process [14]. These components, which are considered the fundamental prerequisites of the talent identification process, are defined based on various dimensions such as anthropometric, skill, physiological, and psychological indicators [15]. In recent years, attention to the athletic abilities of individuals with disabilities, especially in identifying talents and providing opportunities for their participation in Paralympic competitions, has become one of the important priorities of international disability sports federations [16]. Given the increasing prevalence of sports among these individuals, there is a strong need to utilize credible and targeted research resources in the field of talent identification for individuals with disabilities [17]. Although various factors play a role in the process of sports talent identification, specialists and researchers in the field of youth and adolescent sports believe that the indicators of sports talent identification in this age group can be classified into four general categories: specialized characteristics related to the execution of sports skills, physiological characteristics, perceptual-cognitive abilities, and finally, the psychological characteristics of athletes. Among these, and specifically in the fourth group, the goal orientation of athletes can be utilized [18]. Identifying individuals' psychological capacities is a key factor in determining talent and predicting the success of elite athletes. Psychological variables are recognized as the main and influential components in the process of identifying and predicting sports talents in most sports talent identification models [19]. Sports psychologists categorize mental skills into three main groups: basic skills, psychomotor skills, and cognitive skills [17, 18]. Basic skills include goal setting, self-confidence, and commitment; these skills are the foundation of other mental skills, and until they are formed in an athlete in a stable and established manner, other skills cannot reach their desired level. The second group includes psychomotor skills, which encompass stress response, fear control, relaxation, and energization, and are primarily related to the athlete's physiological reactions and characteristics. The third group, known as cognitive skills, includes imagery, mental rehearsal, concentration, and similar skills; these skills are categorized in this group due to their direct connection with cognitive processes such as learning, perception, recall, and thinking [20]. For this purpose, considering standardized mental talent identification tests can play an effective role in identifying and nurturing sports talents [21]. Some mental traits play a decisive role in sports success, and athletes utilize these skills to achieve an optimal mental state. These traits include self-confidence, focus and attention, high commitment, goal orientation, resilience, having an optimistic attitude, optimism, constructive perfectionism, and competitive motivation [22]. One of the significant gaps in this area is the lack of localized indicators of mental skills for identifying sports talents in individuals with physical-motor disabilities; an issue that underscores the necessity of conducting specialized and targeted studies in this field. The establishment of effective talent identification systems not only increases competitiveness in attracting professional athletes but also strengthens their commitment to clubs and sports teams by reducing the rate of player turnover. Therefore, adopting management approaches that align with the needs of athletes and planning to enhance their psychological skills with the expertise of sports psychologists in clubs seems essential. Despite the significant importance of mental skills in the talent identification process, studies show that this issue has received less attention. Furthermore, no comprehensive research has been conducted on the introduction of psychological indicators effective in identifying

mental skills and their evaluation, especially in athletes with physical-motor disabilities across various sports disciplines. Accordingly, the question arises: what indicators and criteria should coaches and talent identification officials consider in the field of mental skills to identify talented athletes? Thus, the aim of this research was to examine and present the most important components of mental skills effective in the sports talent identification of athletes with physical-motor disabilities.

Methods

The present study was descriptive-cross-sectional and conducted with the aim of examining the factors related to mental talent identification in athletes with physical-motor disabilities.

Participants

Participants in the present study were all athletes who took part in the talent scouting festival of the Federation of the Disabled and Handicapped in December 2023 in Tehran, totaling 367 individuals, including 194 women and 173 men. Considering that the required sample size for factor analysis studies is suggested to be 10 to 15 respondents per questionnaire item (Klein, 2005, p.7), it can be said that the criterion has been well met. The average age of the participants in the present study was 17.87 years, with an age range of 15 to 26 years and an average sports experience of 2.5 years. The participants were engaged in 8 sports disciplines, with the majority in athletics (48.8%), sitting volleyball (17.2%), powerlifting (13.6%), basketball (8.2%), and other disciplines (shooting, archery, swimming, and arm wrestling) (20.4%).

Research tool

The data collection tool in this research was a researcher-developed questionnaire for identifying mental skills in athletes with physical disabilities. This questionnaire consisted of 22 items based on a five-point Likert scale (from strongly disagree = 0 to strongly agree = 4). To design the tool, a systematic review of the theoretical foundations, previous research, and specialized texts in sports psychology was conducted. Additionally, semi-structured interviews were held with several experts in the field of sports psychology, prominent coaches, and university faculty members. Participants in this stage were purposefully selected from among specialists with practical experience in sports talent identification, particularly for athletes with disabilities. Based on the collected information, an initial list of the most important psychological components affecting talent identification in athletes with disabilities was prepared. Subsequently, using qualitative content analysis techniques, the initial items were extracted and compiled. Items that had conceptual overlap or ambiguity were reviewed and refined through several stages, and ultimately, 22 final items were selected for the questionnaire. To assess face and content validity, the questionnaire was provided to six faculty members and sports psychology experts. The expert judgment method was used to revise the items. The specialized judges offered suggestions regarding clarity, conceptual appropriateness, and comprehensiveness of the items, which were reviewed and incorporated into the final version of the questionnaire. To measure reliability, a pilot study was conducted on a sample of 20 athletes with physical-motor disabilities. The initial analysis results showed that the Cronbach's alpha coefficient for the entire questionnaire was 0.807, indicating acceptable reliability and good internal consistency of the tool. According to international standards [19], a Cronbach's alpha coefficient above 0.7 is considered appropriate. The final questionnaire was designed in two sections: the first section included demographic

information such as age, gender, sports history, sports discipline, and activity level, and the second section included the main items related to the identification of mental skills.

Data collection method

For this purpose, the researchers were present at the location of the athletes participating in the talent identification festival at the Federation of Disabled and Handicapped. The mental skills talent identification questionnaires were randomly distributed among athletes with physical and motor limitations. The questionnaire was distributed among the research samples in two sections: personal details and the main section of the questionnaire (mental skills talent identification).

Data analysis method

In this research, exploratory factor analysis was used to analyze the data and examine the conceptual structure of the mental skills talent identification questionnaire. This method was employed to identify the underlying components and correlation patterns between the items. Factor analysis was conducted using the principal component method, and to simplify the interpretation of the factors, the Varimax orthogonal rotation was applied. Before conducting the factor analysis, the adequacy of the data and the suitability of the correlation matrix between the variables were evaluated to ensure the validity of the analysis method. To measure the internal consistency of the questionnaire, Cronbach's alpha coefficient was used, which is a common indicator for assessing the internal consistency of psychometric tools. Additionally, normality tests were conducted to examine the data distribution and determine the type of statistical tests needed in the subsequent stages. All statistical analyses were performed using SPSS software version 26.

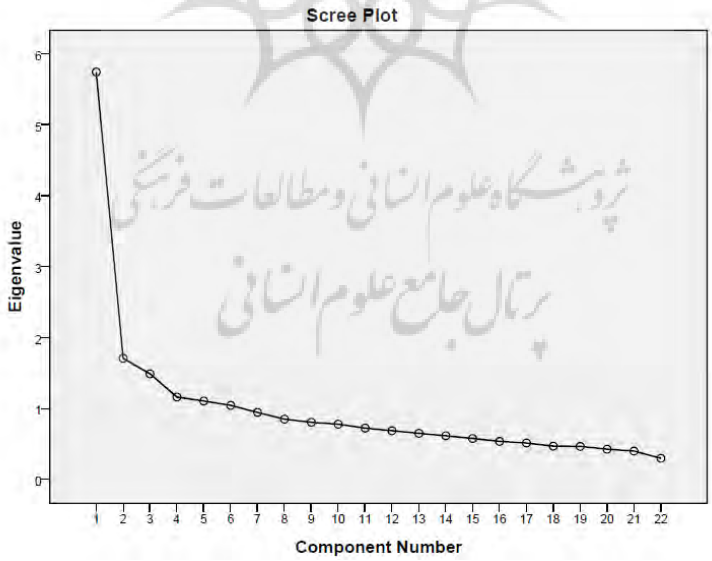

Figure 1 - Theoretical model of the questionnaire structure based on the Scree criterion along with the corresponding factor loadings and structural relationships with subscales

The KMO value and Bartlett's test were also significant at the 0.001 error level (P < 0.001). Items that loaded on a factor with a factor loading of 0.30 or higher were included. Table 1 shows the factor loadings of each item after Varimax rotation. In total, six factors had eigenvalues greater than one, explaining 55 percent of the total variance. Upon examining the factors, it was determined that questions 11 and 16 related to the sixth factor should be removed from the analysis due to having a factor loading of less than 0.30. With the removal of these questions, the number of items in the sixth factor dropped below 3, and therefore the sixth factor was also identified as a weak factor and removed, with its two questions being categorized into the second and fifth factors.

Table 1. Items related to each factor in the questionnaire for identifying the mental skills of athletes with physical disabilities

factor loading	Questions (Item)	factors
0.607	2	Factor1: self-confidence
0.480	7	
0.647	10	
0.754	17	
0.734	18	
0.573	22	
0.407	6	Factor2: resilience
0.702	14	
0.373	16	
0.506	19	
0.624	20	
0.696	21	
0.757	1	Factor3: Goal Setting
0.702	3	
0.644	4	
0.726	5	Factor4: competitive motivation
0.566	9	
0.358	12	
0.701	13	
0.748	8	Factor5: commitment
0.373	11	
0.741	15	

Self-confidence factor: This includes items (2, 7, 10, 17, 18, 22) and had the highest factor loading for these questions, with an eigenvalue of 5.745, explaining 26.1% of the total variance of the test.

Resilience factor: This factor includes items (6, 14, 16, 19, 20, 21) and had an eigenvalue of 1.708, explaining 7.7 percent of the total variance.

Goal-oriented factor: This factor includes items (1, 3, 4) and has an eigenvalue of 1.489, which explained 6.7% of the total variance.
Competitive motivation factor: This factor includes items (5, 9, 12, 13) and has an eigenvalue of 1.162, explaining 5.2 percent of the total variance.
Commitment factor: This factor includes items (8, 11, 15) and had an eigenvalue of 1.106, explaining 5.0 percent of the total variance.

Table 2. Percentage of the most important components of mental talent identification in athletes with physical-motor disabilities by sport and gender

Weighted Overall Average	Boys	Girls	Swimming	Arm Wrestling	Athletics	Archery	Basketball	Para Powerlifting	Shooting	Sitting Volleyball	Group
30.21	30.13	30.34	30.64	31.01	30.28	30.17	30.09	30.65	29.26	29.79	self-confidence
25.98	26.71	25.40	26.40	23.81	25.88	25.81	26.25	26.06	25.32	26.67	resilience
14.57	14.61	14.55	14.07	15.33	14.34	13.47	14.33	15.08	14.63	14.91	Goal Setting
18.34	18.25	18.45	18.69	19.16	18.77	19.17	17.90	17.59	17.44	17.88	competitive motivation
10.90	10.30	11.26	10.21	10.69	10.73	11.39	11.43	10.62	13.34	10.75	commitment

Discussion and Conclusion

The aim of the present study was to examine and present the most important components of mental skills effective in sports talent identification, specifically for athletes with physical-motor disabilities. For this purpose, the researchers sought to identify the psychological components related to sports talent identification in adolescents and young adults with physical limitations through factor analysis. The results of the study, based on exploratory factor analysis, showed that the psychological components were categorized into five main factors (self-confidence, resilience, goal orientation, competitive motivation, commitment), which explain the most important psychological indicators in sports talent identification. Overall, in the present study, these skills are considered as strategies to facilitate the process of mental talent identification and the effective recognition of athletes with physical-motor disabilities. According to the research background, mental skills play a role beyond physical readiness, technical abilities, or tactical understanding in sports success; because what distinguishes elite athletes from others are their psychological capabilities and competencies, which define the boundary between good performance and excellent performance. Certainly, currently, prominent and expert coaches in the field of talent identification, in addition to physical readiness, pay special attention to the mental and psychological readiness of players. The findings of the study by Prieto-Ayuso et al [13] also support the notion

that greater emphasis on psychological skills is necessary in talent identification models. Furthermore, these researchers believe that the process of sports talent identification should begin in school and thus welcome the replacement of modern talent identification models during childhood and adolescence. Considering the modern methods of athlete preparation and the decreasing chronological age of national and international champions in Paralympic competitions, various factors are effective in the psychological talent identification process. These factors include the living environment [15], sports background, athletes' gender, type and nature of the sport [17], and the level of physical ability. These variables, along with psychological characteristics, must be simultaneously considered to ensure a comprehensive and effective talent identification process for individuals with physical limitations. Based on the research findings, it can be concluded that all the indicators mentioned in the psychological talent identification process are important, and other factors along with their interactive effects can also play a significant role in this area. The role of psychological factors in athletes' performance is no less than physical-motor abilities. Therefore, sports psychology is considered not only for enhancing performance and success in competitions but also as a tool for mental talent identification in sports. Accordingly, the results of the present study on the importance of the key components related to talent identification and the improvement of performance and success levels of athletes in eight sports (sitting volleyball, shooting, para-weightlifting, basketball, archery, athletics, arm wrestling, and swimming) showed that the first component, self-confidence, is more prevalent among arm wrestlers and in girls than in boys. Thus, it can be concluded that self-confidence holds a significant place in this sport, and girls possess more self-confidence in arm wrestling compared to boys. The second component, resilience in sitting volleyball among boys, has been identified as an important factor, and it can be inferred that among the eight sports examined, sitting volleyball boys have shown greater resilience; thus, resilience can be a crucial factor for success in this sport. The third component identified was goal orientation, where boys in arm wrestling exhibited higher levels of goal orientation in this study. It can be concluded that for mental talent identification in arm wrestling, goal orientation should be prioritized among the athletes' mental characteristics. The competitive motivation component also received high scores from shooting athletes, similar to goal orientation, indicating the importance of competitive motivation among talented athletes, especially girls, who scored higher than boys. The final component, commitment, received the highest score from the group of female shooters. Therefore, it can be concluded that commitment is one of the important factors in identifying talented individuals in this sport for success. In the overall conclusion of the present study, it can be stated that, based on the weighted average, self-confidence, resilience, competitive motivation, goal orientation, and commitment are respectively the most important factors in identifying talented athletes with physical-motor limitations. In girls, self-confidence and competitive motivation, and in boys, resilience, goal orientation, and commitment are identified as important factors in the mental talent identification of these athletes. Therefore, coaches and talent scouts can identify individuals with the aforementioned indicators in the talent identification process, and this criterion will serve as a suitable guide and instruction for improving the talent identification process. Additionally, the overall results align with the exploratory factor analysis and the identification of five effective factors in mental talent identification, consistent with the findings of the studies [17, 20, 22]. Therefore, it can be concluded that the efforts made in examining the most important components affecting the mental talent identification of athletes with physical-motor disabilities have been fruitful. This questionnaire, considering its implementation method and ease of scoring—which are the most important practical aspects of the test—serves as a useful and valid tool. It can assess the mental talents of athletes with limitations within the socio-cultural context of Iran, making it a reliable and credible instrument for

various sports disciplines. Finally, given that the data obtained from this research were examined in the age group of 15 to 26 years with an average sports experience of 2.5 years, generalizing this research to other age groups and levels requires careful consideration. Therefore, it is suggested that to generalize the findings of this research, athletes at different age and skill levels should be studied separately, as the talent identification process according to the dynamic model changes over time and requires continuous evaluation.

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