

# A Systematic Review on Psychological and Physical Factors in Talent Identification

Muhammad Noor Hizami Hamidi<sup>1</sup> and Mohd Rozilee Wazir Norjali Wazir<sup>2</sup>

<sup>1</sup>Department of Physical Education & Health, Faculty of Education, Universiti Teknologi MARA Malaysia

<sup>2</sup>Department of Sports Studies, Faculty of Education, Universiti Putra Malaysia Malaysia

\*Corresponding Author: dakspotrek@gmail.com

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**Abstract:** Prior studies mostly focused on physical factors such as physical fitness, motor abilities, and anthropometry as indicators for talent identification (TID). However, there are two critical issues that have been emerging recently among young athletes, which are burn-out and early drop-out. Thus, this study suggests to include another factor as an indicator for TID, which are psychological factors. The aim of this paper was to identify the psychological factors that would be good indicators for the TID programme along with the physical factors. This systematic review uses the PRISMA method to logically summarise the identified psychological and physical factors that would be good indicators for TID. A comprehensive electronic literature search was conducted via Google Scholar and open access journals. 30 literature selections were selected based on a few criteria. This systematic review conclude that a set of physical fitness, anthropometry, motor abilities and several psychological factors such as personality traits, emotional intelligence and grit should be included as TID indicators to select a physically talented athlete that have the psychological ability to endure the development process. A selected athlete might be physically competent but psychologically incompetent. This is the explanation of the importance of psychological factors must be included as indicators for the talent identification process in sports to avoid the current critical issues which are burn-out and early drop out among young talented athletes. However, a proper selection of psychological factors must be made to choose a good psychological indicator because an indicator for talent identification must be consistent throughout the time period. A longitudinal research method is required to provide more evidence for this theory.

**Keywords:** *Talent identification, Athlete selection, Sports development, Sports psychology*

## 1. Introduction

Talent is defined as the successful outcome of domain-specific performance. In order to attain the highest standard within particular sports, athletes rely on a combination of natural abilities (nature) and well-developed performance determinants (nurture) [1]. Understanding the characteristics that might predict future performance is crucial to gaining insight into how talented individuals are detected or identified and how talent might be transferred to different domains. Talent identification is a complex study where it seems

it cannot be done by focusing on a single specific area or a few similar areas because it will produce an imbalanced result. Many studies have been done before by focusing on a single specific area or a combination of a few similar areas, and the result was positive where it has the ability to discriminate between "talented" athletes and "non-talented" athletes. That is still debatable and questionable since that kind of study did not cover all the elements that have a direct impact on athlete performance. According to Reeves, Littlewoods, McRobert and Robert [2], the biggest problem with talent identification is detecting the most

**Corresponding Author:** Muhammad Noor Hizami Hamidi, Department of Physical Education & Health, Faculty of Education, Universiti Teknologi MARA, MALAYSIA. Email: dakspotrek@gmail.com

sophisticated ways in which talent is trying to be detected, identified and developed. Many talent identification systems focus on low predictive and validity values.

Previously Mevaloo and Shahpar [3] define talent identification as screening of youth using physical and skills attribute to identify the potential in them to success in certain sports without having pre-engagement with that sports. However there is another important element that has not included in that definition is psychological. Many study has found that psychological has massive impact on athlete performance thus it is important to take into consideration of that element during talent identification process. Many potential athlete with good score in physical fitness and motor ability facing problem during training and competition due to psychological factor. Some of the unable to manage their anxiety during competition and some of them unable to cope with the training program [4], [5]. Due to that issue world are facing sustainability of the athlete in specific area. The rates of high potential youth athlete's dropout were alarming. There were a few factor that contribute to early athlete dropout such as burnout due to focusing on early focusing on single sport. Due to certain reason such as scholarship or professional contract, most of the youth athlete start to focusing on single sports training over 15 years ago [6]. This phenomenon result in lack of motor development compared to the athlete who had early diversification [7]. Besides the youth athlete who practice early single sport training lost the opportunity to develop various sports skills [6]. A study done on top 10 athletes' age 14 to 19 years old for Royal Spanish Athletics Federation (RFEA). There were 1,144 participants consist of 594 males and 550 females athletes. There was a significant reduction of athletes in the top 10 from 2004 to 2014. Among the 1,144 athletes taken into consideration in 2004, 1,104 (96.50%) were considered as dropouts from high performance in 2014: 543 (98.72%) were women, and 561 (94.45%) were men [6]. This study found a few common answer among the participants for the question of the athlete dropout such as "my skills did not improve", "did not like to compete" and "not able to be with my friends" [6]. The single sport training phenomenon leads to higher rates of injury, increased psychological stress and early sport dropout [6].

According to Hassan et al. [8], Hong Kong found the reason for dropout in sports among school athletes was due to four factors. The greatest factor was the coach. To build trust, a coach must first earn the athlete's respect. Coaches must also have extensive knowledge of the sport in question, as well as the ability to establish and maintain a positive relationship between athlete and coach. This factor was followed by teammates, parents, and tough training [8]. Meanwhile, Monteiro et al. [5] found almost the same factors of dropout, which are: most of the athletes drop out because of conflicts with their trainers, "other things to do", "competence improvement failure", "parents, couples, or trainers' pressure", "lack of enjoyment" and "getting bored". Besides, children or youth athletes also drop out because of not having fun in that specific area of sports, anxiety and nervousness due to excessive criticism, pressure from coaches and not getting along with coaches, parental pressure and loss of ownership, and not having enough time to participate in other age-appropriate activities [4]. Most of the dropout cases among young athletes were due to intrapersonal and interpersonal constraints [9]. In 2018, de Souza, Osiecki, da Silva, Costa, and Stefanello [10] were conducting a study through the athlete burnout questionnaire and found that there are positive correlations between burnout and competitive level, training volume, years of training, perfectionism, and overtraining in high-performance athletes.

Most of the problems seem to come from psychological factors. Besides, a study found that there is a discrepancy in the talent identification process among established and emerging nations (football), where the coach and sporting professional recruitment decisions are based on their subjective opinion of a player's future playing potential [11]. Therefore, this paper will discuss the importance of combining physical fitness, motor ability, and psychological assessment in the talent identification process and its potential effect on the athlete development process based on the previous study, so that the coach and sporting professional no longer need to rely on their subjective opinion alone.

## **2. Method**

Systematic Literature Review (SLR) is a method that has been used to collect and compile a set of previous research to answer formulated research questions based on a structured procedure such as identifying, summarizing, analyzing, and interpreting the findings

from the selected previous research. Researchers determine a set of the criteria for the literature selection to ensure the selected literature is relevant to the topic discussed and inter-related. This study used PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) as a guideline. The PRISMA method was commonly used in systematic search and meta-analysis due to its transparency, structure, and comprehensiveness in synthesizing the literature.

Two electronic databases (Open Access Journal and Google Scholar) were searched for publication from 2015-2020. The search area was focused on talent identification in sports, including physical factors (anthropometry, physical fitness, and motor abilities) and psychological factors. There were 368 pieces of literature discovered, of which 82 were removed because they were duplicates. 286 were left, but 56 were excluded based on the title being not relevant to this study. Based on the full-text articles assessed for eligibility, 214 were removed due to the study's failure to meet the inclusion criteria out of 230. Only 16 pieces of literature met the inclusion criteria out of 368 and were added together with another 14 from the selected paper and review citation.

<b>Preferences:</b> Empirical research published through international conferences and international journals	Book Chapter, short report, non-empirical study.
<b>Area of Interest:</b> Talent Identification in Sports	All scientific disciplines except in talent identification performance assessment

### 3. Result

Based on the searching method, this study was able to retrieve 30 research articles related to talent identification in sports. Those articles were divided into two categories, which are physical factors and psychological factors. Tables 2 and 3 present the author's name and years of publication, the purpose of the study, the sample and size of the study, and the outcome according to each category.

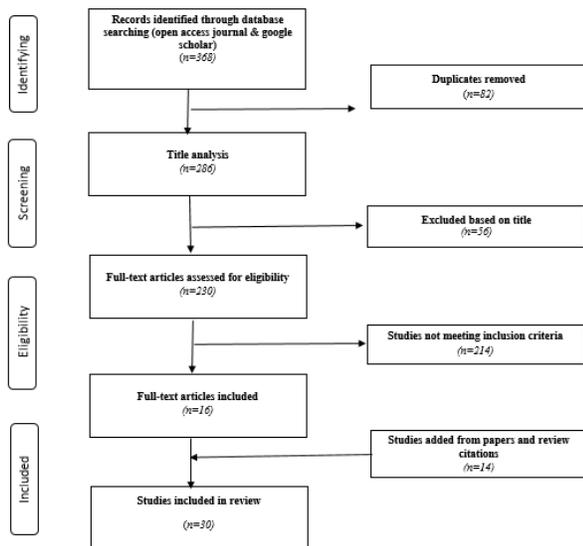


Fig 1 PRISMA flowchart

Table 1: Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
<b>Language:</b> English only	Other than the English language, written
<b>Period of Publication:</b> 2015-2020	Before 2015

Table 2: Summary of article related to physical factors for talent identification

Author(s)	Purpose of the study	Sample & Size	Outcome
Woods, et. al [12]	Compared the athletic movement skill between elite Under-18 (U18) Australian football (AF) and senior Australian Football League (AFL) players	22 elite junior AF players.	The U18 sample has a lower mean total score for four of the five movements. Overall scores of 49/63 and 50/63 discriminated against the elite U18 sample from Group 1 and Group 2, respectively. U18 players may have less developed athletic movement skills when compared to their senior AFL counterparts.
Woods, et. al [13]	Aimed to discriminate talent identified junior AF players from their non-talent identified counterparts using a fundamental gross athletic movement assessment.	50 U18 AF players	This study demonstrates the utility of a fundamental gross athletic movement assessment for TID in junior AF. Despite significant between-group differences noted on four of the six movement criteria, it was the production of the overhead squat that provided the greatest level of talent discrimination.
Rahmat, et. al [14]	Investigate the association between motor performance and somatic type, anthropometric, body composition, physiological and physical fitness profile in young wrestler.	16 young wrestler, age 16-19 with 4 years' experience in national championship.	Coaches can plan a wrestler's training programme and review technique based on anthropometry and physiological data driven by their sports performance.
Gaudion, et. al [15]	Identify the physical fitness, anthropometric and athletic movement qualities discriminant of developmental level in elite junior Australian football (AF).	77 players.	A significant effect of developmental level was evident in 9 of the assessments ( $d = 0.27-0.88$ ; $p < 0.05$ ). However, it was a combination of body mass, dynamic vertical jump height (non-dominant leg), repeat sprint time, and the score on the 20-m multistage fitness test that provided the greatest association with developmental level.
Schorer, et al [16]	Evaluate the prognostic validity of talent selections by varying groups 10 years after they had been conducted.	68 female handball players.	75.9% were correctly forecasted as low achievers, while 24.1% were predicted incorrectly since they were high-achievers. The fitness test was found to be a significant predictor. Prediction and opinion of national and regional coaches don't have a huge

			significant difference. The group of players were able to predict 75.8% correctly. For the group of novices, the percentage of correct classifications went down to 72.4%.		sporting abilities and dispositions and their use in the process of sporting selection.	analysis of practical knowledge, generalization, systematization.	sports ability. Unwanted characteristics in one type of sporting activity may be advantageous and guarantee high performance in the other.
Mitchell, et. al [17]	To examine whether a contemporary TID testing battery successfully discriminate between high and low level of performer in elite junior swimming cohort.	48 elite national-level junior swimmer.	The TID testing battery successfully discriminates between high and low levels of performance in an elite junior swimming cohort.	Datson, et. al [20]	Ascertain the predictive value of relevant physical performance measures for determining future career progression in youth elite female soccer players.	228 youth female soccer players previously involved in residential Elite Performance Camps.	Predictive utility of high-intensity endurance capacity for informing career progression in elite youth female soccer and providing reference values for staff involved in the talent development of elite youth female soccer players.
Boccia, et. al [18]	Describe and analysis the performance career trajectories for Italian athletes that participated in sprint, hurdles, discus throw and shot-put athletic events.	5929 athletes	Regression analysis shows that entering competition later was linked to better performance during adulthood. Only 17%–26% of top-level adult athletes were considered as such when they were 14–17 years old.	Ford, et. al [21]	To survey the TID and TDE processes in soccer youth academies from multiple countries around the world. The youth academies at 29 professional soccer clubs from around the world participated.	29 youth academies in Europe.	The nature of many TID and TDE processes at the clubs has become more professionalized as a function of player age. Player age was associated with widening the search area for players, increasing the use of a multidisciplinary approach to TID, amending the objectives of TID, and increasing the number of matches and training sessions. However, the
Shynkaruk [19]	To investigate the features of hereditary and acquired characteristics and to determine	Analysis of sources of literature and Internet, regulatory documents,	The weak manifestation of personality traits and qualitative characteristics of one kind of sport cannot be considered as a lack of				

			annual turnover of players in the most recent season was relatively high at 29%.
Bergkamp, et. al [22]	Discuss advantages and limitations of the design, validity, and utility of current soccer talent identification research. Draw on principles from selection psychology that can contribute to best practices in the context of making selection decisions across domains.	Phenomenological Approach- Qualitative Method Document analysis	There are only a few studies within the talent identification literature that used individual soccer performance as an outcome measure. Thus, it is not clear whether predictors of perceptions of successful performance are also valid predictors of individual match performance after selection.
Norjali, et. al [23]	Investigate the differences between elite and non-elite taekwondo athletes in anthropometry, physical performance and motor coordination	98 Taekwondo athletes.	Anthropometry, physical performance, and motor coordination are able to discriminate between elite and non-elite taekwondo athletes.

Table 3: Summary of article related to psychological factors for talent identification

Author(s)	Purpose of the study	Sample & Size	Outcome
Gee, et. al [24]	To test the predictive contribution of a normative personality profile on athletic success over a 15 years' time period.	124 amateur hockey players. Only players who competed in at least 82 regular season.	Personality measures appear to add to a coach's ability to predict an athlete's longitudinal athletic attainment.
Sadri & Janani [25]	To evaluate the correlation between EI and self-regulation (SR) in elite male swimmers of East Azerbaijan Province, Iran.	100 male swimming athlete.	The results showed that there is a significant positive correlation between the total scores of EI and SR. Also, all components of EI (except social awareness) had a positive, significant correlation with the total SR score. Among the components of EI, social awareness had a negative significant relationship with SR.

Darvishi, et. al [26]	Assess effectiveness of training components of emotional intelligence on mood of female student athletes.	60 student female athlete.	The results showed a significant increase in positive mood and a reduction in negative mood in the trial group compared to the control. However, in the variable of confusion as a negative mood, the difference between the two groups was insignificant.	Campo, et. al [28]	Test the effect of emotional intelligence training intervention to improve EI at traits level.	67 rugby players.	EI training improves an athlete's EI, which affects performance.
Chakarvarti [27]	Determine the relationship of emotional intelligence with social physique anxiety and performance of sprinters.	23 sprinters, including the high performers (N1=8) and low performers (N2=15).	The results revealed that all the components of emotional intelligence have a negative, insignificant relationship with social physique anxiety and competition performance among sprinters. High-performance sprinters were more emotionally intelligent with less social anxiety than low-performance sprinters.	Gill [29]	Examine the impact of emotional intelligence and goal setting in basketball.	16 Basketball players.	Results revealed that participants who displayed high emotional intelligence levels set frequent goals. Participants also found that barriers to goals were overcome through specific action planning and related to individual requirements. Data for emotional intelligence demonstrated that participants also became self-aware of their own performance levels. In sum, this investigation advocates the use of goal setting to enhance emotional intelligence levels for performance outcomes in basketball.

Trnini, et. al [30]	Understanding the difference between young and senior athletes in contact ball sports in terms of their personality is important information for expert coaches, scientist-practitioners, and sport psychologists involved in management of the development of athletes and teams.	602 athletes from active in one of the three team sports, all training and playing in Croatia.	Handball and water polo players differ significantly in their conscientiousness and openness. In comparison to young players, senior players show more pronounced agreeableness and conscientiousness (ability to control impulses), which facilitates goal and task-directed behavior. Also, openness is more pronounced in senior players.	Mur, et. al [32]	Systematically review the predictive value of psychological talent predictors and provide better comprehension of the researchers' methodological approaches and the empirical evidence for individual factors.	Systematically review. Analyzing the number of included studies, psychomotor (n = 10) and personality-related factors (n = 8) received more consideration within the literature than perceptual-cognitive factors (n = 4).	New research addresses the necessity for large-scale studies that employ multidisciplinary test batteries to assess young athletes at different age groups prospectively.
Borghuis et. al. [31]	Examine big-five personality traits stability, change and co-development in friendship and sibling.	N=2230	Stability of personality traits was already substantial at age 12, increased strongly from early through middle adolescence, and remained rather stable during late adolescence and early adulthood.	Kim, et. al [33]	Examined the relationship between athletes' big five personality characteristics and their occupancy of informal roles as identified by self-nominations and teammate nominations.	340 French athletes (Study 1) and 195 Canadian athletes (Study 2).	Athlete personality may underpin the processes by which athletes come to occupy informal roles on their teams.
				Cavanaugh [34]	Determine the association of risk factors to burnout and grit among Division I collegiate athletes.	17 males and 25 females.	There is a positive relationship between burnout and grit among Division I collegiate athletes.

Sanchez, et. al [35]	Analyze the relationships between motivational climate (MC), emotional intelligence (EI), and anxiety within a sample of footballers playing at a low level.	282 registered football players aged between 16 and 18 years old.	The results showed that footballers who reported higher levels of state anxiety and trait anxiety also demonstrated lower EI and more negatively perceived and regulated emotions.	structural equations analysis.			
Latifah, et. al [36]	Determine whether there is a significant relationship between intellectual intelligence and emotional intelligence with the achievement of pencak silat athletes PPLP West Java.	N=14	There is a relationship between intellectual and emotional intelligence and the pencak silat achievements of athletes from PPLP West Java.	Mollazadeh , et. al [38]	In this study, personality characteristics of neuroticism, extraversion, and openness to new experiences, consensus, and task of male and female athletes were compared in team and individual sports.	160 athletes professional in two disciplines (75 men: 39 men and 36 women) and group (72 men: 41 men and 31 women) in Kerman province.	The findings of the study showed that the athletes' scores in group sports in agreement, extraversion, and task were significantly higher than in individual sports. Individual athletes had a high risk of neuroticism, and athletes had a lower score than men in all of the components except for neuroticism.
Sanchez et. al [37]	Analysing the connections between motivational climate in sport, anxiety and emotional intelligence depending on the type of sport practised (individual/team) by means of a multigroup	372 semi-professional Spanish athletes.	Team sports and emotional intelligence dimensions correlate more strongly in team sports than in individual sports.	Cazayoux & DeBeliso [39]	Identify the level of grit in novice and advanced Crossfit athletes in order to determine if levels of grit play a role related to performance in the sport of fitness known as Crossfit.	Male and female Crossfit athletes (n=50)	The advanced Crossfit athletes (n = 23) scored significantly higher than the novice athletes (n = 27) for both the 12-Item Grit scale as well as the CI subscale.

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Kumar [40]	Identify all the importance factor in psychology that affect sports person to being successful.	Personality, Stress, Motivation, Aggression, Arousal and Activation, Attention and Concentration	Psychological aspects have a major impact on sportspeople on their path to being successful.
Li, et. al [41]	Identify potential profiles of personality and emotional traits based on a sample of professional Taekwondo athletes from China. In addition, the study also aimed to examine the utility of the profiles in predicting successful athlete performance.	332 professional Taekwondo athletes from different regions in China (187 males and 145 females).	The results seemed to suggest that Taekwondo athletes with more performance success were more likely to have a profile of positive personality and emotional traits, while athletes with less performance success were likely to have somewhat elevated levels of self-control, extraversion, and aggression.

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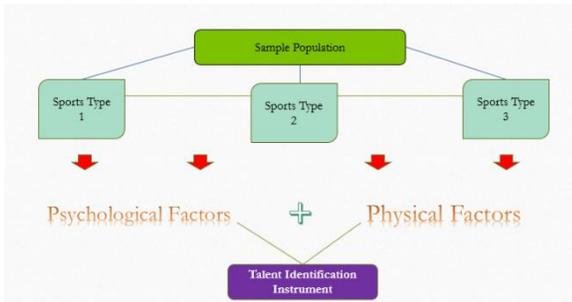


Fig 2 Conceptual Framework

#### 4. Discussion

TID in sports research has recently undergone a revolution. As shown in table 2, researchers started to combine a few areas of study, which resulted in better findings in terms of data reliability and validity to be used by the coach or professional sportsperson for sports development. A good TID foundation to consider is a combination of physical assessment, sporting achievement, and coach opinion based on previous experience [16]. Besides, the combination of a few components, as the TID testing battery, is able to discriminate between high and low levels of performance in an athlete. A study combining the components of power, aerobic capacity, and anthropometry assessment as a TID testing battery on elite junior swimming in Australia found that it was able to differentiate between high-performance and low-performance athletes [17]. In addition, Datson et al. [20] stated that a combination of physical fitness and motor abilities is able to predict elite youth female career progression in soccer games. It also provides reference value for coaches and professional sportspersons in the talent development of elite youth soccer players. The same goes for a study done in Belgium on taekwondo athletes by Norjali [23]. The testing battery consists of anthropometrical, physical performance, and motor coordination tests able to discriminate between athletes who reach the international top level and those who do not. Many developments in sports have come from the contribution of the TID process. Many studies have found that in the Australian Football League, physical assessment can differentiate between "talented" athletes and "non-talented" athletes [12] [13]. Furthermore, a study of the Junior Australian Football League discovered that a combination of athletic movement quality tests, physical fitness tests, and anthropometric assessment could identify the difference in the rate of performance development. In addition, a study discovered that the physical, skill, and experience gained by youth athletes during their early development are important in producing future elite athletes [42]. The current TID programme was able to identify the good potential of youth athletes at an early stage based

on their physical performance, but according to Boccia et al. [18], early sports success is not a strong predictor of top-level performance at the senior level. Besides, there is still another issue yet to be solved, which is the drop-out issue among the selected athletes. The use of complex TID methods and the capabilities required to identify new talent in order to achieve peak performance in the future. Athlete performance indicators should be based on sporting aptitude, physical health and abilities, body coordination, and psychological aspects [19].

However, there are some issues that keep appearing along with the athlete's development. Ford et al. [21] stated that the percentage of drop-out among youth soccer players from 29 professional soccer clubs around the world is relatively high at 29%. Some potential youth athletes have very good scores for physical fitness and motor ability but have inconsistent performance during competition, resulting in early drop-out due to psychological incompetence. Most of them feel burned-out, bored, not competitive enough and too dependent [6]. Besides, global youth athlete early drop-out is phenomenal due to youth athletes' not having fun in that specific area of sport, being unable to control/manage their anxiety, especially during competition, feeling pressure during training, and not getting along with the coach [4]. In addition, a study done by de Souza et al. [10] found that there are positive correlations between burn-out, competitive level, training volume, years of training, perfectionism, and overtraining.

Another factor that has been identified as a burnout and drop contributor is single-specific sports training practise by a coach and professional sportsperson. Previously, coaches and professional sportspeople focused on single-specific sports training on potential youth athletes, and it seems to be a contributor to early drop-out and performance drop among youth athletes. Single-sport training approaches result in psychological breakdown and physical injury (overuse) in youth athletes [6]. Using the TID process, coaches and professional sportspeople are able to identify several types of sports that are suitable for potential youth athletes so that they do not have to focus and stress on single specific sport training. As a result, a variety of sports training has advantages for young athletes in terms of motor ability development as well as preventing psychological breakdown and early drop-out [7].

As shown in table 3, many studies have been done on athlete psychological aspects to find which psychological factors affect the athlete's performance the most, but there are still a few studies on the psychological aspects of the TID process. Many studies have found that physiological aspects have a positive effect when being used as an indicator for TID, but due to a lack of study on psychological aspects of TID, it is difficult to conclude the effect of psychological aspects

being taken as an indicator for TID. Due to the long process, the component that will be used as an indicator for TID must be stable and not easily change over time, because if it is changeable, it will be very difficult for researchers to determine which component is the right one to be the indicator of the right athlete for designated sports. Based on the previous literature, three components in the psychological aspect have been identified as having a positive effect on athlete performance and stability over time. It was personality traits, emotional intelligence, and grit.

According to the previous study, personality traits as a sub-division of psychological variables were assumed to be a good predictor of an athlete's sustainability and performance in a specific area of sports. to be a good indicator to predict the sustainability and performance of an athlete because they have been proven stable for at least 10 years by a study done by Terracciano, McCrae, and Costa Jr [43]. According to Borghuis et al. [31], personality traits are already stable at the age of 12 and increase strongly with the increase in age. There are only a few factors that contribute to personality changes, such as extreme incidents or extreme environmental pressure and they were able to predict the future performance of an athlete [32]. However, there were differences in the characteristics of personality traits between males and females, individuals and team athletes [37].

Certain types of personality traits have a tendency to overreact during stressful periods, anxiety, and depression, which lead to unwanted decisions or actions. Hence, they might affect a person's performance and decision making (dropout) [44]. Furthermore, it was not only the environment and psychological factors that induced different levels of stress on different types of personality traits; physical activity also has a different psychological effect on different types of personality traits [45] that has been successful or survived in an environment has a tendency to develop a personality that is suitable for that environment after a process of coping and adaptation towards that environment. A cross-cultural and longitudinal study was done by Chopik and Kitayama [46] between midlife in Japan and midlife in the U.S. The study found that midlife in Japan develops a greater variety of personality traits than in the U.S. because midlife in Japan responds to a variety of environmental factors while midlife in the U.S. responds to a factor that is powerful enough to influence nearly everyone in society at large. Selecting a suitable personality might sort those mentioned problems out, because, based on the study done by Appaso and Ramchandra [47], different types of personalities have different abilities to cope with stressors.

The importance of identifying a potential athlete's personality is to understand their preferences and suitability in a specific area of sports. Every person regulates their emotions in different ways. Assessing the personality traits seems to be a reliable way to

understand a person's emotion regulation; either it is negative-oriented or positive-oriented [48]. Besides, due to the information provided by identifying a person's personality, that person will be allocated to a suitable position or place that makes them feel good and perform better [49].

According to Kim, Gardant, Bosselut & Eys [33], personality traits related to athletes' informal roles in team sports. Various types of personality traits are important in team sports for performance development because the informal roles of an athlete in team sports have an effect on the team sports environment and development. Besides, Kumar [40] suggests that personality traits should be one of the important factors that will affect sportspeople's success. These statements are supported by Li et al. [41], who found that professional taekwondo athletes who have positive personality and emotional traits tend to be successful in performance.

Another component that has the potential to be a good indicator for TID in sports is emotional intelligence (EI). An athlete with a good score of EI is able to control their reckless reaction during a pressure situation and not be emotional [25]. Furthermore, it is trainable, and athletes with higher EI frequently set goals, plan their actions, and are self-aware of their own performance [29]. Thus, a high level of EI significantly increases positive mood and reduces negative mood among female student athletes [26]. A study was done on all India inter-university sprinters to determine the relationship between EI, social physique anxiety, and sprinter performance. Besides, higher EI players have a lower level of anxiety related to sports performance [37]. The results for combat sports also seem to be the same as a study done in West Java on Pencak Silat athletes. In Pencak Silat, there is a positive relationship between EI score and athlete achievement [36].

The last component that has been identified as a potential indicator for TID in sports is grit. Grit is defined as a strong desire to achieve something/goal, so an athlete with a good score of grit tends to be strongly opposed to the negative influence [50]. Cavanaugh [34] stated that grit has a positive correlation with athlete burnout. An athlete who has a good score of grit might have a low possibility of dropping out due to burnout. Besides, grit is also able to discriminate between low-performance athletes and high-performance athletes. A study was done on CrossFit athletes where both advanced and novice CrossFit athletes completed the grit assessment scale, and the result showed that advanced CrossFit athletes score higher than novice CrossFit athletes [39].

Combining these two factors as TID indicator will be able to make TID process more objective oriented by reducing the possibilities of survival versus attraction advantages effect during the process. According to Baker, Johnston and Wattie [51], usually coach will

select the athletes that have greater performance compared to their peers which known as survival advantages but somehow in other situation where coaches tend to give more opportunities to the athletes that the coaches comfortable with not based on the performance. By having a very specific guidelines, coaches might tend to select the athletes that fulfil all the criteria needed for certain sports while the personal perception towards the athletes would be minimized. Besides, in order to recruit a potential athlete that can endure the development process, the athlete must possess the required ability and willing to get involve [52]. If the athletes have the required abilities but does not willing to get involve, most likely that athletes will not survive the development process. To get the potential athletes to get involve willingly, first the athletes must know their abilities physically and psychologically. Sometimes the athletes get involve in certain sports due to the culture of the population without realizing their actual potential for certain sports. They might shows a good performance for certain period of time and struggling to keep improve. Due to aging factors their physical might no longer able to cope with the activities and start to decrease in performance then later affecting their psychological state which lead to drop out. By undergo a TID process that assess both physically and psychologically, the athlete will know their abilities physically and psychologically and which sports are suitable for them. The information gathered from that TID process will give them the opportunity to choose several types of sports that suit their abilities. This will avoid them from practicing single sports specification at young age because it is not a good practice [52].

## 5. Conclusion

All the above literature shows that psychological factors and physical factors such as physical fitness, motor abilities, and anthropometric assessment have a positive correlation with athlete performance and could be a set of indicators for TID in sports. However, for the psychological aspect, there is a lack of evidence to conclude that psychological is a good indicator for TID in sports since the study on that area has never been conducted massively yet. All the above literature regarding psychological aspects shows that the study that has been done only between the psychological component and athlete performance or athlete status. Early sports success is not a strong predictor of top-level performance at a senior level. A study that combines the physiological aspect and psychological aspect directly has not yet been found. Based on this literature review, a study combining physical fitness, motor abilities, anthropometry, personality traits, emotional intelligence, and grit must be done to create a TID testing battery that gathers all the components in sports

that have a positive correlation with an athlete's outstanding performance and future development. Besides, repeated measurements were suggested for this study instead of pre and post-test to monitor the stability of the athlete data and identify the possible factors that contributed to the data changes throughout the study period based on those six components.

## 6. Acknowledgments

This paper is part of the author's theses.

## 7. References

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