

Research article

Personality traits, environment, and career stages of top athletes: An evidence from outstanding badminton players of Indonesia

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ABSTRACT

The world badminton championship is a highly competitive arena. Successful athletes are those who have excellence, not only physically and technically but also mentally. The present study aims to identify the personality traits, environment, and career stages required by an athlete to achieve excellence. The research was conducted with a qualitative approach through in-depth interviews. As participants are 10 Indonesian badminton athletes who have achieved world-class achievements, such as the Olympics and world championships. They consist of 3 female athletes and 7 male athletes. The results showed that seven traits were effective in supporting their achievement, namely: achievement-oriented, hard work, persistent, autonomy, commitment, intelligence, and self-control. The family environment and sports environment influence the formation of traits and the emergence of high-achieving athletes. This research also found that athletes go through 5 phases in achieving achievement, namely exploration, specialization, investment, achievement, and maintenance.

1. Introduction

Research on high-achieving athletes in western culture such as in basketball, swimming, tennis, and athletics has been widely carried out [1–4], but studies of high-achieving athletes in eastern cultures such as badminton players are still very rarely done. In fact, in world-level badminton championships such as the Olympics, some athletes from Asian countries tend to dominate compared to athletes from western countries. As one of the countries in the Asian region, Indonesia's badminton achievements at the world level are encouraging. Many Indonesian athletes have become world legends such as Rudy Hartono, Liem Swie King, and Susy Susanti. Likewise, the playing style of some of the world's badminton athletes currently imitates and is inspired by the style of play of Taufik Hidayat (single) and Kevin Sanjaya Sukamulyo (double). As legends and trendsetters, they certainly have excellence, not only physically and technically, but also mentally. The question is, what personality traits do they have so that they can achieve high achievements? How does the environment affect them? What stages did they go through to achieve this achievement?

In simple terms, a personality trait is a generalized and focalized neuropsychic system with the capacity to render many stimuli functionally equivalent and to initiate and guide consistent forms of adaptive and expressive behavior [5,6]. A personality trait is a predisposition to thinking and doing. How an individual responds to a stimulus is strongly influenced by the personality trait they have. Therefore, what athletes achieve, whether success or failure, is an accumulation of experience that is the product of personality traits. Several research results prove that high-achieving athletes are those who have personality traits that effectively support their

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achievements, such as achievement-oriented, discipline, and persistence [5,7,8]. Athletes who have a persistent trait, for example, are not only persistent in training but also persistent when competing.

From the neuro-psychology perspective, personality traits and human behavior have a neuro basis in the structure of the brain. However, in development personality traits are influenced by environmental factors in which individuals grow and develop. Both interact in determining how the athlete's personality is formed, including in achieving high achievements [9,10]. In many studies, the environment in which individuals grow and develop such as the family environment and school environment is recognized to be very influential on the emergence of high-achieving individuals [11–13]. Even for athletes, the sports environment where there are coaches and teammates will certainly influence their success in achieving achievements [3,14,15]. That's why, in addition to revealing personality traits, this study will also identify and describe the environment that is thought to influence the emergence of high-achieving athletes. In the theory of developmental ecology, it is explained that the environment greatly influences individual development, including how the environment provides opportunities for individuals to achieve success.

Bronfenbrenner identified four levels of environmental influence, namely: microsystem, mesosystem, exosystem, and macrosystem [12]. The four systems span from the immediate environment such as the family environment to a more global environment such as the political situation and government policies. Many studies that identify environmental factors that influence athletes found that there are several main environments in which athletes generally develop, namely the family environment, school environment, and sports environment as well as more macroscopic environments such as sports systems and culture [16–18]. From a number of these environments, which one is more dominant in influencing Indonesian athletes and how do they influence it? So far there has been no satisfactory answer.

In addition to identifying the personality traits and environment of the athletes, this study also attempts to trace the career stages of these athletes. Athlete career stages are defined as the period in which a person starts a career as an athlete starting from they know the sport until they reach the end of their achievements. The study on this issue was initially conducted by Bloom who conducted an assessment of 120 successful individuals from various backgrounds such as artists, academics, musicians, and athletes [19]. From his studies, he constructs the talent development process in three stages, namely: romance phase, precision phase, and integration phase. The division is still too "rough", and wants to incorporate the career development of individuals from various fields into this stage. Whereas in reality, each field may very well have different characteristics. This issue then prompted Cote and Hay to research the stages of athlete career development in particular [20]. According to Cote and Hay, the process of achieving an athlete's career has relatively different stages when compared to other fields such as scientists or musicians. The difference is for example in the case of the occurrence of the golden age. The heyday of an athlete is strongly influenced by chronological age where physical, technical and tactical abilities are at their optimal level, namely 20–30 years.

From the research conducted, Cote and Hay found four stages of athlete career development, namely: sampling, specializing, investment, and recreational years [20]. What Cote and Hay found was less than satisfactory, at least to Bush and Salmela. The question is about the last part of the stage, namely the recreational years. According to Bush & Salmela, recreational years occur when participating individuals do not achieve optimal performance. If optimal performance occurs, the period that should be passed is to maintain it [1]. From here they conducted a study on the process of the athlete's career journey by focusing on achieving the highest achievement. From this study, Bush & Salmela found four stages of athlete achievement, namely: (1) sampling years, (2) specializing years, (3) investment years, and (4) maintenance years. Research in more detail is then continued by many researchers [16,21,22]. Each stage has its characteristics but is related to each other. The stages of an athlete's career development need to be stated here, considering that this study wants to reveal the experiences of athletes who have high achievers. While high achievement itself is achieved by an athlete not suddenly, but through a gradual process. In general, world-class athletes need at least 10 years to reach peak performance [23,24]. The question arises, how long does it take for Indonesian badminton athletes to reach their highest achievements? How long can the performance be maintained? So far there has been no satisfactory answer.

The main problem in this study, apart from being an actual problem at the practical level, also contains a theoretical problem that is still being debated among sports psychologists, especially concerning talent identification and athlete selection [25–28]. Some of them are of the view that personality factors, including talent, affect athlete achievement. Athletes' success can also be predicted based on certain personality traits. Meanwhile, others still doubt whether athlete success is related to or can be predicted based on certain personality traits. If explored further, the debate is rooted in the difference in orientation that occurs in the discipline of psychology itself, namely between the trait approach - which is humanistic oriented, and the state approach - which is behavioristic oriented [2,27,29,30]. The results of this study can explain how psychological factors relate to the development and achievement of athletes.

1.1. Need for and purpose of the present study

The main focus of this study is to examine the personal experiences of several Indonesian badminton athletes who have excelled at the international level. The study is directed at efforts to reveal personality traits, influential environments, and career stages possessed by athletes. Many things are not known about Indonesian athletes who are high achievers. This issue will never be revealed as long as the study of personal experiences between them is not carried out in-depth. Although personality traits are important prerequisites for achievement, environmental factors cannot be ignored. Many potential athletes do not develop optimally simply because the environment is less supportive. Therefore, identifying the environment that influences an athlete's performance and how that environment affects it is an integral part of this study. After the traits and environment have been identified, the research is continued by revealing the career stages of the athlete. All of these problems will be revealed simultaneously through a qualitative approach. Based on these problems, the objectives of this study are (1) to find the personality traits possessed by Indonesian badminton athletes who are high achievers, (2) to identify and describe the environment that influences the development of personality traits and athlete achievement,

and (3) to identify and describe the career stages of athletes in achieving high performance. If the problems in this study can be answered, it will have significant implications for sports coaching. Coaches will find it helpful to develop a pattern of coaching athletes from an early age. Scouting talent by paying attention to psychological factors can also be done. The results of this study will be very useful as one of the considerations in selecting athletes in addition to other considerations such as physical and physiological factors.

2. Methods

To achieve the objectives of this research, a qualitative approach is used which seeks to understand the object of research in-depth and comprehensively and then find the concepts and patterns of these concepts [31,32]. With a qualitative approach, various ideas, attitudes, and values of many people being studied can be revealed in more depth, especially regarding personal experiences.

2.1. Participants

The main focus of this study is to examine the personal experiences of some Indonesian badminton athletes who have achieved high achievements. The selection of respondents was done by the purposive sampling method. There are two indicators used to assess their success, namely international achievements and consistency in achieving achievements. From these criteria, 10 athletes were obtained, consisting of 7 male athletes and 3 female athletes. Before the interview was conducted, the researcher explained the purpose of the study and its benefits, and why the subject was suitable to be a participant in this research. We briefly explain the interview procedure and are committed to maintaining the confidentiality of data according to research ethics. Finally, we asked about the subjects' willingness to participate in the study. All subjects in this study volunteered to provide information for research purposes. Informed consent has been obtained from the participants. The research also has been approved by the authors' institutional review board or an equivalent committee No. RR.September 38, 2021.

Every athlete has won at prestigious world events, such as the Olympics, All England, and World Championships. Of the ten athletes, they collected a total of 33 gold medals, consisting of 3 Olympic gold medals, 20 All-England gold medals, and 10 World Championship gold medals. Among them, some have won 8 times the All England champions, seven of them were obtained in a row.

2.2. Data collection and analysis

Data was collected through in-depth interviews with research subjects. For the interview process to be carried out systematically and directed by the objectives of this study, it is necessary to prepare interview items based on the theory used in this study. Broadly speaking, the questions asked include: (1) when did the athlete in question begin to recognize badminton, who introduced it and how did the introduction process occur, (2) how did an athlete go through periods of training, and competition until he succeeded in achieving achievement. World level, (3) how the athlete's daily activities from waking up to sleep at night, including how he goes to school, makes friends and spends his free time, (4) who are the people who are considered to play a role in the athlete's career and how the roles they perform.

Interviews with the ten participants were carried out according to the agreement between the researcher and each participant. The length of the interview for each subject ranged from 1 to 2 h. For those who are relatively senior and have a lot of experience, the interview time is generally close to 2 h. Meanwhile, for those who are still listed as national athletes, the interview time is approaching 1 h. The entire interview process was carried out by the researcher himself using a tape recorder as a tool. Besides being conducted on the main research subjects, interviews were also conducted with people who were considered to have intensive interactions with the subjects such as coaches and parents. Some of the interviews were conducted face-to-face and others were conducted indirectly (by telephone). Telephone interviews were conducted for reasons of distance, where the respondents' domicile was outside the city and far from each other. Although the researchers have tried optimally to obtain data, not all parents and coaches of the ten participants can be obtained data. Considering that some of them have died or are abroad. Interviews with them were conducted for approximately 15–30 min. For the trainer, the questions revolve around how well the trainer is familiar with the subject, how he or she describes the subject, and how he or she trains the subject. Meanwhile, for parents, the questions revolved around how the subject initially got to know badminton, how the subject's days were when they were still with them, how they educated the subject and how their role and support were related to the success of the subject.

After the data is collected, data management is carried out to organize the data system so that the data is easy to process and analyze [33]. For this purpose, several things were carried out in this study. After the interviews were conducted, the raw data from the interviews were transcribed in written form. The transcripts were arranged in a way that allowed the researcher to take field notes. From the existing transcripts, an editorial arrangement was carried out without reducing the meaning of the actual expression. Each interview file is coded containing information on the characteristics of the subject, the time of the interview, and the place of the interview. The transcribed data is given back to the subject for verification purposes. The transcripts that have been confirmed for accuracy are read carefully and repeatedly to understand the ideas, attitudes, imagination, and other psychological aspects of the participants. The activity is continued by identifying a series of interview events that are the embodiment of the subject's personality traits, finding keywords, and interpreting them based on relevant references. Repeat the steps above to identify the environment that influences the subject's success and the stages of the athlete's career development. After carrying out the above series of processes for each transcript, the themes and categories were then arranged to display the patterns between the categories. Data analysis was carried out using Nvivo 12 Plus software [34,35].

2.3. Establishing trustworthiness

To maintain the credibility of the research, triangulation, peer debriefing, prolonged engagement, and member checks were carried out [36,37]. Triangulation is an effort to find the validity of data by cross-checking, either through other methods or data sources. Method triangulation is carried out by applying various data collection methods in a series of research processes, such as documentation studies, interviews, and observations. Meanwhile, triangulation of data sources was carried out on various sources of information obtained such as mass media news collections, research results from other parties, interviews, and observations of the relevant environment. Peer debriefing is done by presenting findings, both temporary and final findings. This step is intended to obtain substantial input and critical views including criticism of the researcher’s “working hypothesis” and the research findings that have been produced. Prolonged engagement is carried out as an effort to build networks and trust with research subjects, as well as to understand more deeply the culture, habits, and behavior of the subject. The member check is intended to provide an opportunity for respondents to learn the truth of the data, the adequacy of the data, and its meaning. Thus, the validity of the findings obtained from the research process can be guaranteed [31,32,37].

3. Results

3.1. Psychological Traits of outstanding badminton players

Based on a qualitative study of ten participants, it can be found 7 personality traits that support athlete achievement. The seven personality traits are achievement-oriented, hard work, persistence, commitment, autonomy, intelligence, and self-control. Achievement-oriented refers to the existence of a strong desire to achieve success. Athletes who have achievement ambitions are not easily satisfied with their performance. He always wants improvement, is optimistic about what he is doing, always wants to compete, is dominant, and is target-oriented. Hard work refers to the sincerity of the efforts made to realize the ambition of achievement. Athletes who have this personality trait don’t just run the coaching program or spend time exercising, but they always try to do the program with great sincerity and high intensity. He is also proactive, aggressive, and likes a challenge.

Persistence refers to the ability to make efforts consistently and continuously. Athletes with this personality trait are not quick to give up on making efforts and have resistant to discomfort. Persistence can be seen from the frequency of effort and the length of time devoted to activities. Commitment refers to the athlete’s willingness to follow and adhere to the provisions, both those that come from within the athletes themselves and those who come from outside. Athletes who have committed are those who love their profession, focus on tasks, discipline, and responsibility for their duties, and are willing to sacrifice other interests for the sake of the profession they have chosen. Independent refers to the athlete’s willingness to do something independently and responsibly. An independent athlete is an athlete who not only trains when there is a program from the coach but is also self-taught. Independent individuals are athletes who are independent and like personal responsibility. He often also takes the initiative and can manage himself responsibly. Intelligence refers to the ability to think rationally, act in a directed manner, and be effective in responding to stimuli from the environment. Intelligent athletes are athletes who can make decisions in difficult times, for example changing tactics and playing strategies quickly and effectively. He is also a responsive learner, able to analyze and act carefully, and creatively to come up with unique ideas or techniques in playing. Self-control refers to the ability to control feelings, thoughts, and behavior effectively. Athletes who have self-control are those who can control destructive desires for achievement. They also have emotional stability, which can control feelings of anxiety, anger, and the desire to end the game quickly. In addition, he is also sporty about what he has worked for and produced.

How these seven personality traits exist in the subject, Table 2 and Fig. 1 can provide a description. In Table 1 it can be seen, for example, that subject A1 has an “independent” personality trait that is more prominent than other personality traits. Likewise, the A8 has a very prominent achievement orientation. It should also be noted that the low occurrence of personality traits in the subject, for example in the case of A9, does not mean the person has a weak personality. But more because in the interview, the subject is less cooperative so researchers do not get enough information.

From Fig. 1, it appears that achievement-oriented has the highest frequency of occurrence, followed by hard work, persistence, autonomy, commitment, and intelligence. While the lowest frequency is self-control. It should also be emphasized here that the data in

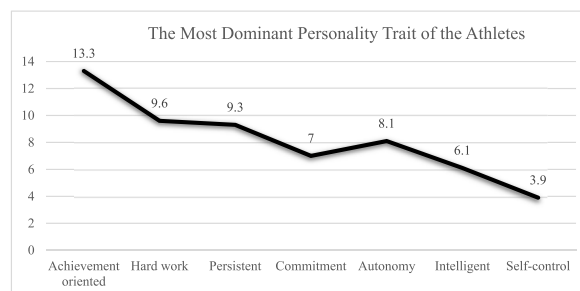


Fig. 1. The most dominant personality trait of the athletes.

Table 1
Characteristics of research participants.

Participants	Sex	Achievements
A1	Male	Champion of All England 1972, 1973, 1979; World Championship 1980; Thomas Cup 1973–1986
A2	Female	Champion of All England 1968; Uber Cup 1960–1972
A3	Female	Champion of All England 1979; 555 World Cup 1980; Uber Cup 1986; World Invitation 1984
A4	Male	World Championship 1993; China Open 1993; Korea Open 1993; Indonesia Open 1996; 555 World Cup 1992, 1997; Thomas Cup 1998
A5	Male	Champion of Olympic 2000; All England 1999, 2003; World Championship 1997; China Open 1996; Indonesia Open 2001
A6	Female	Champion of Olympic 1992; All England 1990, 1991, 1993, 1994; World Championship 1993, 1995, 1996, 1997
A7	Male	Thomas Cup 2002, 1988; World Championship 2001; Olympic 2000 (runner up)
A8	Male	World Championship 1983; Alba Word Cup 1985; 555 World Cup 1986; Indonesia Open 1986, 1988
A9	Male	Champion of Olympic 2004; World Championship 2005; Indonesia Open 2003, 1999; Thomas Cup 2000
A10	Male	Champion of All England (1968–1974, 1976); Olympic 1972 (exhibition); World Championship 1980; Thomas Cup (1970, 1973, 1976, 1979)

Table 2
The frequency of personality traits appears of each athlete.

Participants	Personality Traits						
	Achievement oriented	Hard work	Persistent	Commitment	Autonomy	Intelligent	Self-control
A1	10	8	6	12	16	9	6
A2	16	11	15	10	13	5	4
A3	14	8	10	9	11	5	7
A4	9	12	8	10	5	7	4
A5	21	4	7	7	2	3	3
A6	14	10	5	4	7	6	3
A7	11	7	16	3	4	5	5
A8	24	13	6	2	14	8	4
A9	2	2	3	3	2	1	1
A10	12	21	17	10	7	12	2

Note: A1 = first athlete, A2 = second athlete, A3 = third athlete, and so on.

Table 1 and Fig. 1 are not intended as an attempt to generalize the personality traits of the subject. In reality, each subject has its uniqueness. For example, the “independent” personality trait of subject A5 is different from that of subject A9. Independence A5 is shown more in terms of training, for example, the initiative to do the exercises alone. However, on the subject of A9, independence is shown in terms of expressing his opinion.

3.2. The environment that influences the emergence of outstanding athletes

3.2.1. Family environment

In this study, it was found that the family is an environment that has a very large influence on athlete achievement. Associated with the influence of the family environment, the role of the father is so prominent. The influence can be direct or indirect. The question then is, how do parents influence their children so that the child becomes high-achieving athlete? The following description will provide an explanation related to this question.

3.2.1.1. Parenting. It must be recognized that the family is the first and foremost environment for children. In the family, a child learns about the norms, habits, and value systems that apply in society. Likewise, in the family, a child learns about discipline, responsibility, and respect for others. All of these are socialized and transformed by parents through parenting.

“... my father often taught me responsibility. For example, I say: “Dad, tomorrow morning I want to practice.” Then I have to keep my promise and wake up at 5 am. So when I was a bit lazy to get up in the morning, my father said: “You have to be disciplined, if you want to exercise in the morning, you have to be consistent in getting up early (A6).”

Parenting is intended as a way for parents to socialize with their children. From the parenting style applied by parents to the subject (especially A4, A5, A6, A7, and A10), several prominent characteristics were found. First, parents determine achievement standards or certain goals related to what the subject does, for example, to do morning exercises, at 5 o’clock he must be up. Second, there is control from parents over what the subject does. Third, responsive to what the subject experienced. From these characteristics, it seems more appropriate if the parenting pattern of most subjects is categorized as authoritative.

3.2.1.2. Culture of sport. Most of the subjects of this study came from families who like sports. From an early age, parents tried to create a sports culture in the family environment. The sports culture is intended as an effort to instill habits, values, and behavior in children so that they enjoy doing sports, regardless of the type of sport. From here, parents began to introduce badminton to their children.

“... my father likes sports such as football, tennis, and bowling. Well, that’s maybe I imitated my parents. At that time, coincidentally at my parents’ office, there was a badminton activity, yes ... I was invited to join. If the parents like sports, they want their children to come too, you know ... so I went along and played around. Finally, I also like sports, there are athletics, swimming, basketball, volleyball and finally, I love badminton (A2).”

From the facts found, it shows that generally, the subjects do not directly pursue badminton, but instead other sports. Like the A1, A9, and A10, initially liked football more. Even for A1, he had been a star team in his hometown. Likewise, A2 won the pentathlon, A3 won swimming and A6 won roller skating. Efforts to introduce badminton are generally done by inviting the child to watch a badminton match or inviting the child to “hit” in the field. The efforts of parents to introduce their children to playing badminton are certainly not without reason. There is hope that is hung by parents far in the future so that their children can excel in badminton. Badminton is considered a well-established sport and therefore provides considerable opportunities for achievement. A child whose parents expect him to become a great athlete will have a higher chance than a child whose parents do not have expectations in that direction. Parents’ expectations will be realized in various ways, for example by involving themselves in their children’s activities.

3.2.1.3. Modeling. The term model here refers to the notion used in social learning theory, which is an attempt to imitate the behavior of others which is then considered a model. Most of the research subjects first got to know badminton from their parents, especially fathers who happened to be former players or at least could play badminton.

“I know badminton from my father. At the age of 8, I was introduced to badminton at that time was quite a popular sport. ... my father is a badminton fan and also the manager of the badminton club. I started to be taught to play badminton (A10).”

Teaching badminton to kids can be very challenging, let alone training it, and requires relatively adequate knowledge and skills. With their parents as former badminton players, even though their achievements are not as good as the subject, it is certainly an advantage. At least, what parents do and show becomes an inspiration and an example for the subject. For example, how to hold a racket, swing a racket, make a shot, and so on.

3.2.1.4. Training. Training is defined as an effort to increase knowledge, ability, and skills to play badminton through a series of programs and procedures that are specially designed. At first glance, there seems to be a resemblance to the notion of parenting. But there are specific differences between the two. The result of parenting is more oriented toward the cultivation of values and habits, while training is more about improving certain abilities and skills. From the facts in the field, it was found that five out of ten athletes who were the subjects of this study, when they were juniors were trained by their parents. Parents who train their children generally have the ability and badminton skills, because they are former badminton players.

“My coach until junior was my father. Because the father is also a badminton player even though he did not achieve at the national level. To intensify training, my father then founded his club in 1977. Since then, my brother and I have been able to train intensively (A4).”

Training is also given not only for playing, but also for the formation of physical aspects that support badminton games such as footwork, endurance, power, speed, and agility exercises. The training given by the parents greatly influences the development of subsequent achievements. An example is A6, this athlete is known to have a good mastery of the field, because from an early age his parents, who are also coaches, provide footwork exercises. Likewise A10, this athlete is known to have strength and speed in playing, because his parents who are also coaches emphasize strength and speed in training.

3.2.1.5. Social support. When a child likes badminton and is followed by a fairly strenuous training process until he finally decides to pursue it, it is certainly not an easy matter. They lost a lot of playing time because they had to practice badminton. When he was a teenager, he seemed to have lost the opportunity to socialize and make friends like other teenagers. Even the strenuous exercise he undergoes from day to day may be very boring for a child. In such conditions and situations, parental support becomes very important.

“At first I felt heavy. At 6 in the morning, physical exercise started at 8, 8.30 school until 13.30. Then at 15.00 practice again until 19.00. Because it was so crowded, I felt uncomfortable. But then mom gave me support, by asking what do I want to be later? I answered I want to be like Ivana and Vera. Well, if you want to be like them, yes you have to work hard, and practice. From there I trained harder again (A6).”

3.2.1.6. Financial support. Badminton can be considered a sport that requires high costs, at least when compared to other sports such as running, swimming, football, and volleyball. High costs are required, especially related to playing equipment such as rackets, used shuttlecocks, and racket strings that often break. In addition, the daily costs for training such as transportation and consumption as well as the cost of matches if participating in competitions in various regions. With the many costs incurred, the financial support from parents becomes very meaningful. That is, the socioeconomic status of parents also influences the athlete’s achievement. From the facts found, most of the subject’s parents, although not rich, can be said to have a sufficient economic level.

“My father is in the business of buying and selling building materials, so he has a building materials shop at home ... (A4).”

“My parents are entrepreneurs, my mother used to own a textile shop. My father is self-employed too, and used to be a contractor (A5).”

3.3. Sport environment

The sports environment can be said to be the second home for athletes, which influences their achievements. There are at least three facts that can be used as reasons why the sports environment is so important for athletes. First, in terms of time, the sports environment ranks second after the family. Even if he has become a national athlete, almost all of his time is spent in the National Training Center. Thus, the interaction between the subject and the environment becomes more intensive. Second, the life experiences of athletes, especially those related to the struggle for achievement, are widely found in this environment. For example, how the subject must train hard to face a match, how he must maintain his physical condition, how he must regulate his diet, and so on. Third, this environment has control over the subject, especially related to the subject's efforts to achieve achievements.

Related to the sports environment, this study found that the role of coaches and teammates is very prominent in influencing athlete achievement. How or in what ways do they affect athlete performance? The following description will explain this question.

3.4. Coach influence

3.4.1. Training

As stated above training is intended as an effort to improve the abilities and skills of athletes in playing badminton to achieve high achievements. That is why training activities are generally dominated by activities that contain how to improve performance. In general, the training model carried out by the trainers looks like training in general. That every training has a purpose. To achieve these objectives, training programs are compiled, implemented, and evaluated systematically. But interestingly, the training process does not only provide material in the form of drilling, as does the concept of operant conditioning. But accompanied by reasoning why the exercise is important to do. So that athletes are encouraged to do exercises in earnest.

"When he gave the practice he was serious and explained what was being practiced. So for example, this exercise strengthens this muscle, this exercise strengthens the smash, and so on. So that we do it seriously even though it's hard because we know what the benefits are for us (A1)."

Another important finding was that although the exercise was carried out in groups of 4–6 people, the exercise program was arranged individually. This treatment is certainly very beneficial, especially related to the development of each athlete. This is because the developmental level and needs of each athlete are different. One athlete needs an increase in hitting technique, while the other athlete needs an increase in endurance. The coach's foresight in analyzing the athlete's strengths and weaknesses and then determining the appropriate service is an important factor.

3.4.2. Leadership

Even though the main task of a coach is to transfer the ability and skills to play badminton. However, along with the training process carried out, coaches often teach attitudes, habits, values, and behavior to their athletes. In other words, a coach is still doing the parenting process. Parenting that is based on teaching the value system is usually directly related to efforts to achieve high achievements, such as discipline and commitment to the profession. Parenting by coaches appears to be more prominent when an athlete is away or no longer with their parents. Practically, the coach is the second parent of an athlete.

"... if I train not only in terms of technique..., but the main thing is the non-technical problems, such as his concentration, courage, and self-confidence ... that's what I emphasize. When it comes to physical, people know how it's done ... (PA9)."

3.4.3. Modeling

Most of the subject coaches are former badminton players, and even among them are world-class players. As coaches, they try to transform what they have, both in terms of playing skills and competitive experience. Skill transformation is carried out through the teaching process, giving examples, and repetition. Because of the successful experience they have in badminton, in certain respects, they are more accurately considered mentors. Under these conditions, the transfer of knowledge, skills, and attitudes is more effective.

3.4.4. Social support

When an athlete has decided to join a club, especially when he has entered the National Training Center, direct interaction with parents becomes less and less. In such a context, the figure of the coach becomes very important. Not only as a trainer but also as a supporter.

"I am calmer when accompanied by a coach. So my relationship with him is as a coach, brother, mother, and friend. So when I'm tense ... even though I'm already a champion when I play I'm still tense. I always say, "Oh Chi., I'm really tense huh.." Then he said, "it's okay papa, that's normal, now it's warming up, it will go away on its own". Likewise, if for example, you lose, he advises "what were you lacking ..., you know?" From there we discuss (A6)."

3.4.5. Provide opportunity

Opportunities may be something simple and light. Because giving someone a chance does not need to be done with great difficulty. But from that simple and light, the high achievement of an athlete will be created. The provision of opportunities here is intended as an effort to provide a way or opportunity for athletes to display their performances. Providing opportunities can be in the form of

participating in a championship or participating in certain training.

“... in Switzerland, it was a small championship, but by him, I was told to go. In the end, I went and won. That was my first international achievement. Since then, I have won the Thailand Open, China Open, and 555 World Championships (A4).”

From the quote above, it appears that the opportunity to participate in certain championships is likely to be the entry point for achieving subsequent successes. Likewise, athletes who initially did not show high achievements such as A9 and A5 – because they were ranked lower in the selection – turned out to be after being allowed to take part in the National Training Center, eventually became superior athletes.

3.5. Teammates

3.5.1. Modeling

The success of other athletes, especially those who are more senior, can be an inspiration for many subjects to pursue or excel in badminton. Indonesia is very lucky to have athletes like Tan Joe Hok, Ferry Sonneville, and Njoo Kim Bie. They are the ones who pave the way and become inspirations and mentors for other athletes to excel in badminton. Most of the research subjects feel obsessed, wanting to be like their seniors who have already excelled at the world level.

“... and seeing the success of my seniors, Tan Joe Hok, Ferry Sonneville, Indonesia won the Thomas Cup for the first time in 1958, therefore I started to like badminton (A10).”

3.5.2. Sparring partner

Badminton is a game that requires a partner. In a sense, it cannot be played if there is no partner or opponent to face, even if only in practice. This is certainly different from other sports such as swimming, running, archery, and so on. A badminton athlete can evaluate to what extent his abilities and skills are when he competes with other athletes. Therefore, the role of a teammate becomes important in the training process, especially as a sparring partner.

“Even though the coach is not of an international caliber, but the sparring partners are of international caliber, there are Mulyadi, Darmadi, Indratno ... the adult players who are already above me (A10).”

During the 1970-the 80s, the role of a teammate was very important. This is considering when it can be said that there are no coaches who specifically deal with athletes. Generally, they practice alone, giving each other input. Even if there is a coach, it is more directed to physical exercise.

3.5.3. Social support

The role of a teammate is not only as a model and sparring partner but also in providing social support. Support is usually given when an athlete faces a problem, especially if the problem cannot be solved on its own. Several facts are found that when an athlete joins a club, he becomes distant from his family. Especially when the athlete has entered the National Training Center. In such conditions, the role of the closest people such as teammates becomes very important.

“... I share my feelings with my senior brother or closest friend. I usually like to talk when for example there is a problem. ... They generally provide support and I also often ask: how to do it, if this is how ... like that. (A6).”

3.6. Athlete's career stages

Athlete career stages are defined as the period in which a person starts a career as an athlete starting from knowing the sport to reaching the end of his achievements. Of course, the career development of athletes will be influenced by innate and environmental factors. These two factors will vary greatly from one individual to another. Therefore, even though these ten participants both have

Table 3
Career Stages of Participants Based on Chronological Age (in years).

Participants	Exploration	Specialization	First international achievement	Peak performance	Last international achievement	Training period	Achievement period
A1	8	19	23	24	37	5	14
A2	13	15	18	26	32	11	14
A3	7	12	23	28	35	16	12
A4	7	11	26	27	32	16	6
A5	6	11	19	25	31	14	12
A6	6	10	16	21	26	11	10
A7	7	12	22	29	30	17	8
A8	11	12	19	21	26	9	7
A9	8	9	17	23	31	14	14
A10	8	11	18	23	32	12	14

achieved world-class achievements, the process and stages to achieve these achievements are not singularly varied.

The data in Table 3 may provide an overview of when the subject began to know badminton, when specialization was carried out, to how long the subject underwent training to achieve his highest achievement. If the general analysis is carried out using the central tendency - without intending to reduce the meaning of the data from each subject - information is obtained that:

- They start practicing badminton at the age of 8.1 years.
- Specialization is done at the age of 12,2 years.
- The first international achievement was achieved at the age of 20,1 years.
- Peak performance was achieved at the age of 24,7 years.
- Last international achievement achieved at the age of 31,2 years

In addition, by using the data in Table 2, it can be determined how long the subject underwent the exercise, which was then termed the “training period”. The training period is the length of time needed by an athlete in undergoing training to achieve his highest performance. The training period is calculated from the time an athlete enters the specialization stage until the person concerned achieves peak performance. With this understanding, it can be stated that in general, the subject’s training period is 12,5 years. The training period can also be calculated from the time an athlete enters the specialization stage until the person concerned achieves his first international achievement. Using this calculation, the training period is 7,9 years.

By using the data in Table 2, it can also determine the length of time an athlete maintains his achievements, which is then termed the “achievement period”. The period of achievement is calculated from the time an athlete achieves an international achievement for the first time until the person concerned achieves an international achievement for the last time. With these calculations, it can generally be determined that the subject’s period of achievement is 10,6 years. Based on these data and calculations, at least the stages of athlete career development can be arranged. However, to be able to compile the stages of athlete career development, of course, it is not based on time periodization alone, but also on the characteristics of each of these stages. Even according to stage theory, four things must be considered in preparing the stages. First, staging must be able to predict qualitative differences in behavior. Second, the stages must have a sequence, which although each individual has variations, has the same blueprint. Third, each stage that is prepared must have the same conceptual basis. Fourth, the phasing must have an integrated hierarchical structure.

Based on the period and developmental characteristics obtained from the subject data, as well as paying attention to the signs for the preparation of the stages, the researchers tried to construct the career development stages of badminton athletes as shown below.

Stage 1: Exploration

This stage is a period in which a child begins to recognize badminton. Therefore, this stage is called the exploration stage. The goal is more to the fun factor. In terms of time, for girls, it ranges from 6 to 8 years, while for men it ranges from 6 to 9 years. In terms of movement development, this stage leads to the development of basic movement skills such as running, jumping, hitting the ball, catching the ball, and so on. Badminton is not the only sport that children do, but also other sports such as swimming, football, volleyball, basketball, and so on. Although at this stage the child does sports on a fun and unstructured basis, the success of this stage will affect the success of the next stage. Given that through this stage, children have indirectly started to practice strength, agility, speed, and coordination which are the basic capital to enter the specialization stage.

At this stage, the role of parents is so great, especially in creating a sports “culture” in the family environment. In a supportive family environment, children feel encouraged and feel happy to do sports activities. In addition, the children’s play environment also encourages the creation of sports habits, including badminton. *“When I first learned about badminton, no one taught me, ... just regular practice with friends ... and I also played football, volleyball, and basketball at that time (A1).”*

Stage II: Specialization

This stage is a period in which children make choices to pursue badminton. One of the main characteristics of this stage is that the child begins to enter the badminton club. By joining the club, training is more structured and regular. For example, the exercise begins with warming up, stretching, and ending with cooling down. In addition, at this stage, the child begins to practice the basic skills of playing badminton. Playing techniques and tactics also began to be introduced. In terms of time, the specialization stage ranges from 8 to 11 years for women and 9–12 years for men.

“The first time I entered the club, I was in 3–4 grades of elementary school, but because the club belonged to my uncle, I was more flexible. Even so, the practice is still routine three times a week, sometimes more (A6).”

The specialization stage is an important period for children in playing badminton. In this context, an important period is defined as a time when children are ready to receive stimulation and treatment in the form of training in basic abilities and skills to play badminton. Training and competition are the main activities of this stage with a ratio of around 75:25. Failure at this stage will have a major effect on the continuation of the athlete’s next achievement.

Stage III: Investment

At this stage, the athlete is more focused on badminton activities. Most of their time and energy is devoted to badminton activities.

It is not uncommon for him to be willing to sacrifice other interests such as school, making friends, and socializing.

“I hardly ever get to play like children in general. Only at certain times, maybe at school. I use some of the time to practice (A10).”

“... my school at that time was in disarray. I often don't go to school. I go to school only 2 times a week, that's good. (A4).”

At this stage, the main activities remain in training and competition with a ratio of 50:50. Training is directed at sharpening physical abilities, playing techniques, and tactics. Various junior-level championships were followed. In terms of chronological age, this stage will be passed at the age of 11–16 for women and 12–17 for men. It is not uncommon for an athlete to move from one club to another with the reason to improve his ability and skills to play badminton.

Stage IV: Achievement

The achievement stage is a stage where an athlete achieves an international achievement for the first time. The achievement achieved is not yet the peak achievement of an athlete, but is an entry point to achieving higher achievements. In terms of chronological age, this stage is reached at the age of 16–19 years for women and 17–20 years for men. From the subject data, it was found that they entered the stage of achievement during that period. For example A6 at 16 years old, A9 at 17 years old, and A10 at 18 years old. The main activity of athletes remains training and competition with a ratio of about 25:75.

Stage V: Maintenance

The term “maintaining” at this stage contains two important elements, namely improving and maintaining performance. Improving means that at this stage an athlete is still possible to improve his badminton playing abilities and skills to achieve perfection. Therefore, at this stage, an athlete will be able to achieve peak performance, namely the highest achievement that an athlete can achieve throughout his career as an athlete. While defending implies the extent to which an athlete is consistent with his international achievements until the end of his career as an athlete. From the experience of participants, it was found that athletes generally reach peak performance at the age of 24,7 years. Meanwhile, international achievements can be maintained for 10,6 years. The highest achievement achieved varies from one athlete to another. Some athletes have won the World Champion, some have won the All-England, some have won the Olympics, and some athletes are so extraordinary that they can achieve all three. To be sure, the three events are considered the most prestigious and many athletes want to achieve them.

4. Discussion

This study has found seven personality traits that support the success of athletes to achieve high achievements. This kind of research is not the first time, especially by western researchers [3,4,38]. However, the studies that they conducted have not been able to ascertain whether several personality traits they found were typical for athletes in western culture or also for athletes in eastern culture, including what personality traits dominantly affect athlete achievement. This study has proven that achievement-oriented, hard work, persistence, autonomy, commitment, intelligence, and self-control affect the achievements of Indonesian badminton athletes at the international level. Among the seven traits, three dominant traits influence, namely achievement-oriented, hard work, and persistent. The findings of this study are in line with several previous studies which state that the secret to high achievement is not talent, but a strong desire to achieve success followed by long-term perseverance [39–43]. Achievement-oriented and commitment are also the main differences between high achievers and low achievers.

In addition, two personality traits are new findings namely persistence and intelligence. At first glance, the term persistent is often identified or interchanged with the term hard work. Although both have the meaning of effort made by someone, both have different dimensions. Persistence is an effort variable with a dimension of continuity, while hard work is an effort variable with an intensity dimension. An athlete can work hard while training, but not persistently. It can also happen the other way around, an athlete is persistent in training, but lacks hard work. To be able to achieve high achievement, both personality traits are needed in individual athletes. Likewise regarding the intelligent personality traits that are needed for open-skill sports [44,45] like badminton. Intelligent athletes are athletes who can make decisions in difficult times, for example changing tactics and playing strategies quickly and effectively. They are also a responsive learner, able to analyze and act carefully, and creatively to come up with unique ideas or techniques in playing. Without such personality traits, it is difficult for an athlete to win the competition at the international level.

Based on the findings, this study provides an empirical explanation regarding the debate on the influence of personality traits on the success of athletes in achieving high achievements [26–28]. Success in achieving high achievements, in reality, is not something instant, but a long process in which more “inconvenience” than “convenience”. In that context, the athlete's personal quality becomes very decisive. Many athletes fail to achieve high achievements not because they do not have sports skills, but because of personal qualities that are less supportive. From the findings of this study, researchers came to a belief that high achievement in sports will only arise from individuals who have superior personality traits. The unique characteristics that exist in these athletes have been integrated into the sport they are engaged in so that anything will be done to achieve high achievements. Badminton has become a way of life and devotion for them. That kind of mental quality is what is ultimately needed to be able to break through the limit, not only in overcoming the training burden but also in breaking through the achievement limit [46]. The phenomenon of the spirit of immigrants which is usually characterized by hard work, strong internal cooperation, and affirmation of self-identity also strengthens these

conditions [47].

The question then is how are these personality traits formed? This study has found that the family environment and sports environment have a strong influence on the formation of personality traits. In both environments, athletes carry out a direct and intensive process of socialization and interaction. This is in line with ecological theory [12,48], especially regarding microsystems. The findings of this study are also in line with empirical research that has been carried out on 10 Olympic gold medalists from the United States [3]. From the research, they stated that the family environment and sports environment have an important role in shaping high-achieving athletes. In the family environment, the role of parents, especially fathers, is very strong in influencing the athlete's personality. This study found that authoritative parenting [49] is dominantly applied by parents. On the one hand, parents provide achievement demands and on the other hand give attention and affection to their children. The findings of this study confirm some previous studies related to effective authoritative parenting to produce high-achieving children [50–52], both in the family environment and the sports environment [53]. The role of the father is not only limited to nurturing but also being a model [54] for his son. Most of the research subjects, at the beginning of their career, were trained by their father who was also a former badminton player. More or less the same conditions also occur in the sports environment, where the coach has a dominant role. The role of the family environment and the sports environment is not only limited to the formation of the athlete's personality traits, but also the athlete's achievement. For example, by providing support, both social and financial, or by providing opportunities to compete in certain events.

This study has produced several findings related to personality traits and environment that affect athlete achievement. The two concepts are summarized in a theoretical model as shown in Fig. 2. From the figure, it appears that a high achievement achieved by an athlete, which in this study takes the case of badminton, is influenced by the seven personality traits possessed by the athlete concerned. The stronger the intensity of personality traits possessed by an athlete, the more likely the athlete is to achieve high performance.

The personality traits possessed by athletes are influenced by environmental factors, especially the family environment and sports environment. Through the family, a child learns about the habits and values related to life and living. Through the family also a child knows and learns sports. In such a context, the role of parents, especially fathers, becomes very dominant to help children achieve success. This role is carried out through familiarization with sports, parenting, training, social and financial support, and models. The second most important environment is the sports environment. In this environment, a child tries to improve his badminton abilities and skills through a training process. Although the main activity in this environment is training, it does not mean that a child does not learn about habits and values. They learned this, especially from the coach. The experience of the athlete cannot be separated from the experience of the coach. Therefore, the role of the coach is so important in helping athletes achieve high achievements. This role is carried out through parenting/coaching, training, social support, models, and providing opportunities. Another figure in the sporting environment who is also very important is fellow athletes. This role is carried out mainly through social support, models, and sparring.

High achievement is achieved by an athlete in reality through a process. This study has found 5 stages that athletes generally go through, namely: exploration, specialization, investment, achievement, and maintenance. The findings of this study correct the previous career stages of athletes [1], which states that there are 4 career stages, namely: sampling, specialization, investment, and maintenance. Such stages make it difficult to determine when an athlete can excel at the international level. At which stage an athlete excels cannot be known explicitly. Another problem that arises related to phasing is that there is a missing link, especially between the investment stage and maintenance stage. Logically, after a person invests, of course, they will get the results of his investment, only

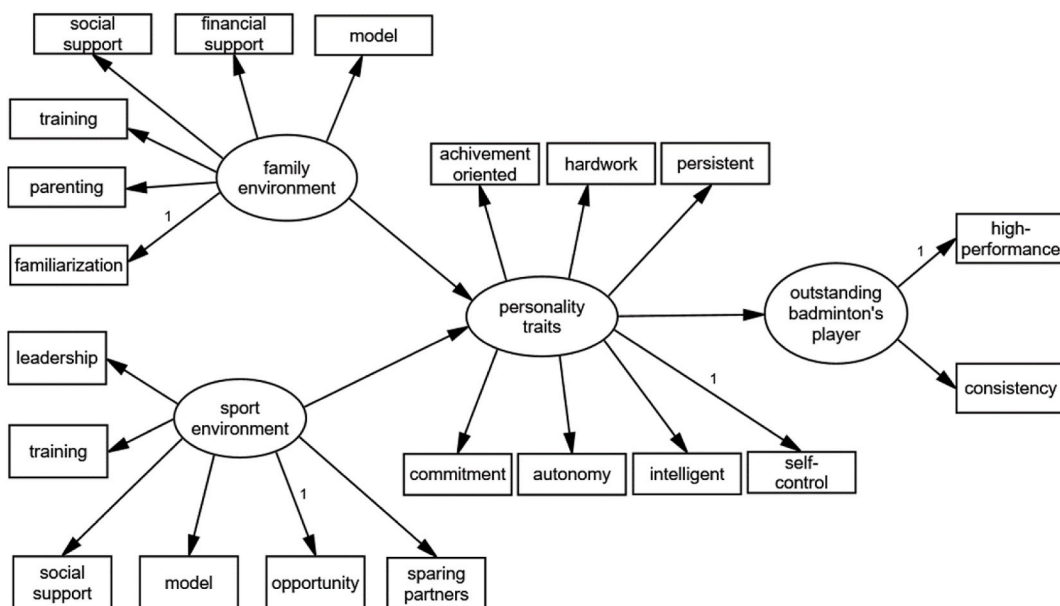


Fig. 2. Conceptual relations model among family, sport environment, and psychological traits in influences outstanding badminton player.

then they must maintain or increase these results. By including the achievement stage, these problems can be answered.

From these stages, it appears that there is an age difference between male and female athletes in the achievement process. Female athletes are faster than male athletes with a difference of ± 1 year. This is understandable, considering that at a certain age, the development of girls is faster than that of boys [9]. For example, at the age of 9 years, the height and weight of girls are higher than boys. Studies on this problem seem to have not been done much, so it is still difficult to find comparative data. Bompas himself as one of the leading figures in the field of talent development and training methods in sports did not mention specifically badminton [23]. What they call relatively close together is tennis, namely the introduction at the age of 6–8 years, 12–14 years of specialization, and high achievement at the age of 22–25 years. If it is assumed that tennis is the same as badminton, the findings of this study are similar to what was stated by Bompas. However, at the specialization stage, badminton is faster than tennis.

Although this research focuses on microsystems that directly affect athlete performance, it is realized that there are macrosystem factors that are thought to also have an effect, such as government policy, talent management, competition, sponsorship, welfare system, and sports science [55,56]. In the case of Indonesia, budget support from corporations and the welfare system are the driving force for the success of badminton. Without financial support from the industry, the journey to achievement will be limping considering that badminton coaching requires no small amount of money, ranging from talent identification and training center to competition [57]. Athletes who have been selected and entered the training center will get guaranteed training costs, participation in competitions, and living costs including continuing education. Education is considered urgent for them considering that not all athletes who enter the training center will become champions. The balance between sports performance and academic performance can create a sense of security for the athlete's future [11,22]. Of course, the quality of training and continuous competition also affects success [23]. The application of sports science such as exercise theory, aspects of nutrition, physiological, medical, and psychological becomes important. The University contributes to providing expert services, including relevant research results. The approach applied is no longer mono discipline-based, but is already multidisciplinary and even interdisciplinary [58,59]. The existence of higher education institutions, especially those related to sports, also influences the success of badminton at the international level.

Strong collaboration between government, industry, and universities, which in the context of an innovation ecosystem is called the triple-helix [60,61], is very felt in influencing the success of Indonesian badminton achievements. Without the presence of these three parties, there is not much the badminton community can do. The ability to integrate government policy, corporate business strategy, and science is critical [62], especially in producing badminton achievements at the international level.

The findings of this study are very relevant as the government's policy establishes the Grand Design of National Sports (DBON, *Desain Besar Olahraga Nasional*), one of which targets is to improve performance at the Olympics. It must be admitted that until now only badminton has been able to bring Indonesia a gold medal at the Olympics. An in-depth study of the success of badminton athletes can be a benchmark for other sports.

5. Conclusions and implications

Based on a qualitative study conducted on ten high-achieving Indonesian badminton athletes, seven personality traits were found that support the athlete's achievement, namely: achievement-oriented, hard work, persistence, autonomy, commitment, intelligence, and self-control. The seven personality traits as a whole are basic prerequisites that must be possessed by badminton athletes if they want to excel at the world level. These seven personality traits, apart from being unique to athletes, are also strongly influenced by the family environment and sports environment. In the family environment, individuals who have great influence are parents, especially fathers. Meanwhile, in the sports environment, the most influential individuals are coaches and fellow athletes. The influence of parents is carried out through cultivating sports in the family environment, parenting, training, social support, financial support, and models. The influence of the trainer is carried out through coaching patterns, training, social support, models, and providing opportunities. The influence of teammates is done through social support, models, and sparring partners. The environment has two influences at once, namely on the athlete's achievement and on the personality traits of the athlete.

Several recommendations are advanced from this study. First, the seven personality traits found in this study need to be considered as psychological indicators in coaching badminton athletes. Second, in the family environment, it is necessary to create a "sports culture", because this is where a child will be interested in and love sports and are expected to also have a "dream" of becoming a high-achieving athlete. Parents need to provide support, not only socially but also financially. Third, the sports environment is the second environment for athletes where the role of the coach is so dominant, not only in the training process but also in nurturing. Therefore, trainers need to equip themselves with supporting knowledge such as parenting champions, communication skills, and so on. Fourth, authoritative parenting needs to be used as a reference for parents and coaches in fostering individual athletes. Fifth, in fostering athletes or prospective athletes, it is necessary to pay attention to career stages, ages, and staging characteristics. Ignoring this not only makes the treatment given not useful but can also harm the development of the athlete.

This research was conducted with a qualitative approach that seeks to understand and describe phenomena and then find concepts. The weakness is that the relationship between concepts cannot be explained in detail, especially using advanced statistics. Therefore, it is recommended that future research leverage the structural equation model to examine the structural relationship between the variables. In addition, the participants in this study were relatively limited. Therefore, in the future, it is necessary to expand the number of participants, including other sports, especially when statistical testing of findings is carried out.

Author contribution statement

Ali Maksum: Conceived and designed the experiments; Performed the experiments; Analysed and interpreted the data; Wrote the

paper.

Nanik Indahwati: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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The data that has been used is confidential.

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