

## Relationship between anxiety levels and the performance of early adolescent athletic athletes in tri-race numbers

### Relación entre los niveles de ansiedad y el rendimiento de atletas atléticos adolescentes tempranos en números de tricarrera

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**Abstract.** This study aims to examine the relationship between athlete anxiety and triathlete performance in early adolescent athletes. The subjects consisted of 95 athletes who participated in the junior high school O2SN championship. This research was conducted in one day, the anxiety instrument was administered after the championship and the athlete's performance was calculated based on the overall athlete's achievement, which was obtained from the competition committee's official results. The Sport Anxiety Scale 2 (SAS-2) is used in the anxiety instrument, which consists of 15 questions, plus 9 questions about the difficulties of athletes in carrying out competitions for each race number, which are taken from the World Athletics Federation (WAF) manual on the rules or race flow of each race number. The relationship between anxiety and triathlete performance in early adolescent athletics is investigated using Pearson correlation analysis. There is a very strong negative correlation between anxiety and tri-race performance of early adolescent athletes with  $r = -0.834$ , and the long jump number is a race number with a high level of anxiety and difficulty based on early adolescent athletes' perception results.

**Key words:** Anxiety Level, Early Adolescent Athlete Performance, Tri-race Athletics

**Resumen.** Este estudio tiene como objetivo examinar la relación entre la ansiedad del atleta y el rendimiento del triatleta en atletas adolescentes. Los sujetos consistieron en 95 atletas que participaron en el campeonato O2SN de secundaria. Esta investigación se realizó en un día, el instrumento de ansiedad se administró después del campeonato y se calculó el desempeño del atleta en base al logro general del atleta, que se obtuvo de los resultados oficiales del comité de competencia. En el instrumento de ansiedad se utiliza la Escala de Ansiedad Deportiva 2 (SAS-2), que consta de 15 preguntas, más 9 preguntas sobre las dificultades de los atletas para realizar competencias por cada número de carrera, las cuales son tomadas del manual World Athletics Federation (WAF) sobre las reglas o flujo de carrera de cada número de carrera. La relación entre la ansiedad y el rendimiento de los triatletas en el atletismo de la adolescencia temprana se investiga mediante el análisis de correlación de Pearson. Existe una correlación negativa muy fuerte entre la ansiedad y el rendimiento en tricarreras de los atletas adolescentes tempranos con  $r = -0,834$ , y el número de salto de longitud es un número de carrera con un alto nivel de ansiedad y dificultad según los resultados de percepción de los atletas adolescentes tempranos.

**Palabras clave:** nivel de ansiedad, rendimiento del atleta en la adolescencia temprana, triatletismo

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### Introduction

Competitive sports success is the result of careful planning, hard work, commitment, and programmed physical training. For athletes, this entails a long-term training program that prepares the body and mind for competition and leads to performance excellence (Bompa & Carrera, 2015). Long-term sports achievement development is very important but difficult to implement (Beaudoin, Callary, & Trudeau, 2015; Ford et al., 2011; Millar, Clutterbuck, & Doherty, 2020). Long-term coaching typically starts between the ages of 12-14 years, when the child enters the early teens or junior high school (Bompa & Carrera, 2015; Jayanthi, Pinkham, Dugas, Patrick, & LaBella, 2013). At the age of adolescence, there are still many changes in terms of affective, cognitive, and psychomotor development, all of which are interconnected (Nebhinani & Jain, 2019). Vulnerability at that age is also complex as it changes, one of which is that adolescence is still in the stage of learning stress and emotion management, so it requires guidance to see what and who a person is ('American Psychological Association', 2006; Nebhinani, 2018).

Early adolescence is still a period of unstable

personality; mental health difficulties in adolescence have a long-term impact, not only on mental health in later adulthood, but also on physical health, educational attainment, participation, and job satisfaction (Fink et al., 2015; Tiwari & Jaiswal, 2020). According to numerous studies, roughly half of all lifetime cases of mental illness appear before the age of 14. In addition to having a negative impact on sufferer health, mental illness places a significant strain on primary care resources (Deraspe, 2013; Keyho, Gujar, & Ali, 2019; Nebhinani & Jain, 2019). A person's mental condition or thinking power is the initial stimulus in carrying out physical activity, and athletes who are always engaged in high-level activities require a good mental condition or thinking power to support their physical condition.

In terms of the importance of mental influence in improving sports performance, research on athletes' mood states shows a dose-response relationship with their training load, a finding that shows the potential to reduce the incidence of anxiety and staleness syndrome or boredom in athletes undergoing intensive physical training (Liu & Yue, 2020; Ohuruogu, Jonathan, & Ikechukwu, 2016). Experts continue to carry out various types of developments related to mental treatment, one of which is

the application of mental practice, which has long been used and the effectiveness of which has been proven to improve athlete performance as well as reduce anxiety (Appelqvist-Schmidlechner et al., 2018; V. Parnabas, 2015). Although the characteristics of each sport vary, the mental role in the development of sports performance remains consistent (Mastnak, 2017). One sign of mental weakness is excessive negative self-talk, also known as overthinking (Ramzi & Besharat, 2010). Anxiety becomes one of the major impacts in early adolescence as a result of a lack of confidence in dealing with a meaningful activity to the teenager, one of which is when facing and participating in sports competitions (Mulya, 2021; V. A. Parnabas, Mahamood, & Parnabas, 2013).

Athletics, which has been named the cornerstone for all sports, is a virtue that must be developed in long-term achievement development, because athletic sports will always be contested in every multi-event, from the highest Olympics to the lowest competitions at the regional level in each country. Track and field, also known as athletics, is a sport that includes running, jumping, and throwing competitions. It is one of the oldest and most popular sports in the world (Yu, 2015). Athletic competition in Indonesia is very diverse for various age groups, including early adolescent or junior high school students. One of the competitions is being held in collaboration with the Ministry of Education and Culture, which is organizing a special multi-sports championship for elementary, middle, and high school students. At the junior high school level, one of the mandatory sports is athletics, which uses the tri-race system, which requires each athlete to compete in three competitions on the same day. The three competition events are a 60-meter short distance run, a long jump, and a shot put (Dikdasmen, 2020).

The sprint, long jump, and shot put numbers are included in the multilateral coaching period and the initial introduction of specialization in the early teens of junior high school (Bompa & Carrera, 2015). The three race numbers are classifications of anaerobic sports specialization types, both lower body (60 meter running and long jump) and upper body (shot put) (Bompa & Buzzichelli, 2015). The three competition numbers that compete in the O2SN middle school championships in Indonesia serve as the foundation for all athletic categories. It can be a forum for the Indonesian athletic sports parent (PB PASI) to attract superior seeds as long-term athletes for the potential development of the competition's results. However, there are many things to consider in developing athletes in their early adolescence, one of which is the mental factor that has been discussed previously. Several research findings indicate that the anxiety level of the early adolescent age group is still unstable to develop independently, particularly in the field of sports achievement development (Contessoro, Costa, Anversa, & Refindini, 2021; Pérez Ordás, Hernández Hernández, & Garca Sánchez, 2015; Royo, Orejudo, & Latorre, 2022).

Several factors, both internal and external, play a role

in athletes achieving their goals before and during competitions (Faqiroh, 2020). Internal factors include athletes' physical and mental abilities, whereas external factors include coaching quality, infrastructure, athlete equipment, weather, and overall support pressure. However, in this article, we will only discuss mental factors that are specified in the athlete's anxiety condition prior to the competition, the athlete's condition in participating in the competition numbers in the middle school athletics O2SN, and the athletes' achievements during the competition. The results of research data analysis (Khan, 2017) that anxiety affects the overall sports performance of a player. There is also research that shows a link between anxiety and level of achievement in 100-meter running competitions, with the result that the more competition experience athletes have, the better they can manage anxiety during competition (Jawoosh et al., 2022).

Considering that adolescent athletes still lack of consistent mental qualities, studies show that adolescent athlete anxiety has a 46 percent effect on group sports performance, implying that there is a need for an increase in mental quality in softball or team sports (Faturchman, 2016). So the aim of this study was to determine the relationship between the level of anxiety of adolescent athletic athletes in the individual sports category in preparing and participating in the middle school athletics O2SN championship with the performance or achievements achieved. Thus, if the aim of this research is achieved, it is hoped that the relationship between the two will be able to improve the quality of athletic achievement in adolescents from the mental or psychological perspective of athletes.

## Method

### *Subjects/ Participants*

The research subjects consisted of 95 participants, which were divided into 49 men and 46 women from 2 regions, Malang City and Kediri City in Indonesia Country, and were taken at the Regency/City level O2SN middle school championships in February 2020. The number of competitions held at the middle school O2SN championships were 60 meters sprint run, long jump and shot put. The research subjects ranged in age from 12 to 14 years, falling into the early adolescent age category.

### *Research Instruments and Procedures*

On the variable of anxiety and difficulty of specialization: using a questionnaire instrument Competitive Sport Anxiety Scale 2 (SAS-2) (Jodhun, Pem, & Jeewon, 2016) for the anxiety variable which consists of 15 questions. The researcher used the validated SAS-2id instrument, and it is known that the psychometric characteristics match the conditions in Indonesia. (Putra et al., 2021). As for the difficulty instrument in athletic specialization that has been carried out as many as 9

questions taken from the WAF guidebook on the flow or race rules for each race number, this instrument is given online via a google form to the subject directly after the championship is finished whose filling is directly supervised by the teacher, coach or parents of each participant in the competition environment.

**Athletic Achievement Measurement**

The O2SN championship committee in Malang City and Kediri City uses competition guidelines from the World Athletics Sports Parent, which are modified into tri-race regulations developed by PB PASI and the Ministry of Education and Culture, in the official competition regulations (World Athletics, 2020). The measurement instruments prepared or used by the committee for each race number are as follows: (1) Running 60 meters using a stopwatch (casio) as a result of the athlete's time record, all on a gravel track, starting with a manual sound, using a standard start block (trinity), wrong start using two opportunities, and only one run so that the order of results uses the best time as the calculation of the tri-race total points. (2) Long jump using a standard meter (tape) for measuring the results of the jump, using a gravel track, a pedestal distance of 1 meter with a jump tub, using only 3 jump opportunities, and taking the best jump for the result of calculating the score at the end of the tri-race. (3) The shot put uses a standard meter (tape) to measure the results of the throw, the weight of the bullet is 4kg for men and 3kg for women, 3 throws are used, and the best throw is used to calculate the triathlon's final score. While the overall result points are taken from the source (Dikdasmen, 2020).

**Statistic analysis**

All statistical analyzes were performed using the IBM SPSS 29 system. The data set was assessed using the Kolmogorov-Smirnov test for normal distribution. For non-parametric data, Spearman's Rank correlation was used to calculate the possible relationship between anxiety levels and athlete performance.

Table 1. SAS-2id instrument (Putra et al., 2021)

Variable	indicator	Item
Anxiety	Somatic Anxiety	2, 6, 10, 12, 14
	Worry	3, 5, 8, 9, 11
	Concentration Disruption	1, 4, 7, 13, 15

Table 2. Tri-race skill stage instrument (World Athletics, 2020)

Variable	Sub Variable	Lndicator
The difficulty of the tri-race number skill stages in early adolescent athletes	60 m Running dash	Start
		Speed Acceleration
	Long Jump	Finish Phase
		Running Approach
	Shot Put	Take off
		Flying and Landing
	Approach Technique	
	Throw Phase	
	Follow Throw	

**Results**

According to the results of the research variable data description (Table 3), the anxiety variable with the highest average is the somatic anxiety indicator, which has a value of 9.56. The worry indicator is 8.47, and the concentration disruption indicator is 7.91.

Table 4 also describes the quantitative results of the relationship between the anxiety variable and the difficulty variable of the tri-race with a significance level of 0.001, indicating that these findings fall into the category of very high correlation. Meanwhile, all correlation coefficients are positive, implying that if the athlete's anxiety is high, the difficulty level of early adolescent athletes during a competition is also high. The highest correlation coefficient data is found in the relationship between anxiety and difficulty in long jump numbers, with a very strong overall value or > 0.800.

Table 3. Matrix of research variable data description

Variabel	N	Min	Max	Median	Mean	Std Deviasi
Anxiety	Somatic	95	5	20	9	9,56
	Worry	95	5	17	8	8,47
	Cocentrade	95	5	17	7	7,91
Difficulty	60m Run	95	3	11	7	6,94
	Long Jump	95	3	11	7	7,32
	Shot Put	95	3	12	7	7,56
Perform	60m Run	95	1	3	2	2,32
	Long Jump	95	1	3	2	1,68
	Shot Put	95	1	3	2	1,82

Table 4. Anxiety relationship matrix (3 variables) with tri-race difficulties

		Correlations			
		DF60m	DFJump	DFShotPut	
Spearman's rho	Somatic	Correlation Coefficient	.769**	.842**	.756**
		Sig. (2-tailed)	<.001	<.001	<.001
		N	95	95	95
	Worry	Correlation Coefficient	.795**	.826**	.663**
		Sig. (2-tailed)	<.001	<.001	<.001
		N	95	95	95
	Concentrade	Correlation Coefficient	.816**	.823**	.639**
		Sig. (2-tailed)	<.001	<.001	<.001
		N	95	95	95

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 5. Anxiety relationship matrix (3 variables) with tri-race performance.

		Correlations				
		P60m	PLJump	PShotPut	PTri-race	
Spearman's rho	Somatic	Correlation Coefficient	-.710**	-.739**	-.648**	-.862**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	95	95	95	95
	Worry	Correlation Coefficient	-.659**	-.648**	-.685**	-.817**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	95	95	95	95
	Concentrade	Correlation Coefficient	-.611**	-.609**	-.597**	-.742**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	95	95	95	95

The description of the data in table 5 that relates the anxiety variable to the performance variable of early adolescent athletes in tri-race numbers reaches a significance level of 0.001, indicating that the data has a very high correlation. The direction of the correlation between these two variables is negative, which means that the higher the anxiety of early adolescent athletes, the lower the performance of early adolescent athletes in tri-race numbers. The relationship between anxiety and difficulty in long jump numbers has the highest correlation coefficient data, with an overall strong value or between 0.600-0.799.

These findings imply that as race numbers become more complex, the athlete's anxiety level rises, with a positive correlation between anxiety and difficulty and a

negative correlation between anxiety and achievement in each race number. The long jump is the most complicated race number because it has a slightly more flow, namely preparing for the start, acceleration before take-off, take-off accuracy, the phase of flying in the air, and finished with landing phase in the sandbox.

The researcher emphasizes, based on the quantitative results of all the tables and elaboration above, that the purpose of this study is not to determine who is the best (champion) and with what achievement or performance, because the purpose of this study is only to determine the strength and direction of the relationship between variables of anxiety, technical difficulty, and performance of early adolescent athletes in the triathlon number athletics.

Table 6.

The level of correlation strength in each research variable

Anxiety	Difficulty						Perform					
	60m		Long Jump		Shot Put		60m		Long Jump		Shot Put	
	Nilai	Norma	Nilai	Norma	Nilai	Norma	Nilai	Norma	Nilai	Norma	Nilai	Norma
Somatic	0,769	Kuat	0,842	Sangat Kuat	0,756	Kuat	-0,711	Kuat	-0,739	Kuat	-0,648	Kuat
Worry	0,795	Kuat	0,826	Sangat Kuat	0,663	Kuat	-0,659	Kuat	-0,648	Kuat	-0,685	Kuat
Cocentrade	0,816	Sangat Kuat	0,823	Sangat Kuat	0,639	Kuat	-0,611	Kuat	-0,609	Kuat	-0,597	Cukup Kuat

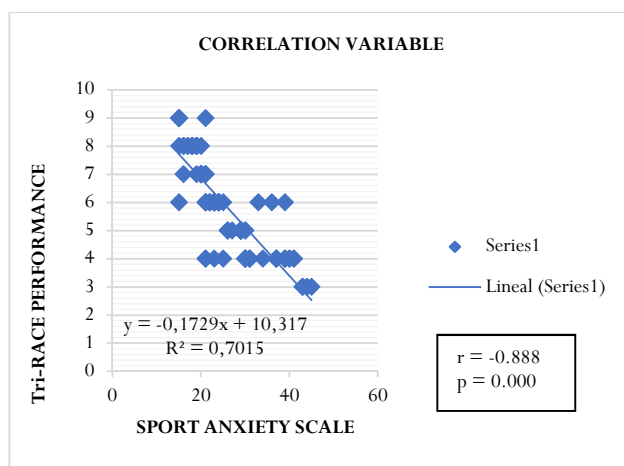


Figure 1. Graph of the relationship between the main variables

## Discussion

The initial stimulus for athletes in physical activity comes from a good mindset, while mental factors determine whether or not an athlete can think clearly, show optimal motor skills, and remain focused (Abou Elmagd, 2019). The anxiety and experience of adolescent athletes in facing competition can be determined to be lacking in mastery, so one of the major causes of adolescent athlete performance is still inconsistent due to immature mental factors (Jawoosh et al., 2022).

The results of the relationship between anxiety and tri-race achievement in early adolescent athletes show a very strong negative correlation, indicating that high athlete anxiety causes early adolescent athletes' performance in three athletic competition numbers, namely the 60-meter run, long jump, and shot put, not to be optimal or having good achievements. According to (Breuner, 2012),

discrepancies in sports readiness and skill development can cause anxiety, stress, and ultimately result in attrition for young athletes. The three race numbers in the O2SN junior high school championship in Indonesia are explosive sports that require athletes to demonstrate their ability to make quick and strong decisions (Bompa & Buzzichelli, 2015). In this case, early adolescent athletes who have not mastered stress management will experience pressure in competition, as well as anxiety in preparation for competition, which is enough to interfere with athlete preparation.

### Correlation of anxiety with tri-race difficulty

According to the data analysis results, the direction of the correlation of these two variables leads to a positive correlation with a very high level of strength. As a result of these findings, the higher the athlete's anxiety level, the greater the level of difficulty experienced by an early adolescent athlete in the tri-race number. There are three indicators in the anxiety variable: (1) somatic anxiety, (2) worry, and (3) Concentrate Disruption. The dependent variable will be related to one of the dependent variables, namely the difficulties that early adolescent athletes face during competition. As a result, this section will concentrate on the relationship between anxiety indicators and the level of difficulty in performing the stages of movement skills during the competition for each of the competitions that are followed, namely the 60-meter run, long jump, and shot put.

The majority of anxiety indicators have a very strong correlation with athletes' ability to perform movement skills in tri-race competitions. Because all indicators of the anxiety variable have a very strong positive relationship, the long jump number has the highest correlation strength. According to research, the complexity of motion in the

jumping category is higher than in the running and throw-throwing categories (Ferrer Alonso, Da Vila Alonso, & Rico Daz, 2019; Figueiredo et al., 2021). Therefore, teens who are still beginners will face greater challenges if they are also anxious.

The perceptions of early adolescent athletes of the typical challenge were described qualitatively for each race number, with the 60-meter running number conveying the majority's difficulties in the starting phase, where they lacked focus and were slow to react to the run. Then, in the long jump number, the majority mentioned their difficulties in the run-up phase before take off, where they were unable to find the right rhythm on the pedestal beam, so the results of the initial run were in vain and the jumps were not optimal. In the shot put number, the majority of athletes expressed difficulty in the after throwing phase, where they mostly lost their balance because the bullet load felt very heavy. Similarly, managing anxiety so that it can be minimized with various efforts to improve it, one of which is by providing experience of competing in the sport in which it is practiced (Juhász, Kálmán, & Tóth, 2020; Prior, Papatomas, & Rhind, 2022), providing a lot of movement experience according to the need for increased achievement so that early adolescent athletes are more confident in their abilities and skills (Silva et al., 2022).

#### ***Correlation of anxiety with tri-race performance***

If the variables anxiety and tri-race difficulty in competition have a positive relationship direction, then the variables anxiety and achievement have inversely proportional results. In other words, the higher the level of anxiety, the lower the performance of early adolescent athletes in tri-race competitions. For all tri-race numbers, the somatic anxiety indicator has the highest level of correlation strength. Somatic anxiety refers to a disturbance in the body's organs or a person's physiological condition when exposed to a tense environment or experiences anxiety, resulting in out-of-the-ordinary symptoms such as a faster heartbeat, sudden abdominal pain, defecate, and so on. A high level of anxiety will more easily have a negative impact on a person's physiological condition, and this will more easily appear in the criteria of someone who has no experience dealing with new situations that have a high element of difficulty.

This is consistent with the findings of a correlation analysis of early adolescent athletes who lack competition experience and have high somatic anxiety conditions. The long jump race number has the lowest performance when all anxiety indicators are present. Aside from the fact that the long jump is more difficult, high anxiety has a strong relationship with poor long jump achievement. This is examined through an analysis of the motion of the long jump, which requires high concentration and calm before making the official jump, so that the start of the run and take off phase are performed properly and optimally, accordingly the level of anxiety also plays a significant role

in the success of the maximum jump result (Filgueira Perez, 2015; McKay et al., 2022).

This data can be used as an evaluation by coaches and athletes in training and preparing for the next competition strategy. If you want to increase achievement in tri-race, the perception of the difficulty of the early adolescent athlete in that event must decrease, which means that the early adolescent athlete must master each race flow well in each race number. (Haugen, Seiler, Sandbakk, & Tønnessen, 2019; Whelan, Kenny, & Harrison, 2016). The sustainability of this research can also be maximized at the long-term coaching stage which involves many stages starting from talent scouting to competition participation (Kurniawan, 2020; Susanto et al., 2022). So that coaches or teachers can understand that the psychological readiness of novice students or athletes, particularly the anxiety of early adolescent children in competing, is an aspect that requires special attention when preparing for competition participation, particularly athletics (Khan, 2017; Kurniawan, Nopembri, & Purnomo, 2022).

While the limitations of this study are the limited research objectives, which only know the direction data and the strength of the relationship between variables. While the variables studied are also influenced by many factors to see the performance of beginner athletes or early adolescents in the implementation of competitions. This research data is also obtained solely through the perception of novice athletes accompanied by coaches or sports teachers serving as officials during the competition, so the long-term preparation in the competition preparation stage cannot be directly determined. However, the data is also strengthened by difficulties in the perspective of tri-race athletic skills or techniques, namely the 60-meter run, long jump, and shot put, so that they can be used as boundaries for providing answers or explanations.

#### **Conclusion**

Overall, the relationship between anxiety levels and tri-race performance (60 meters running, long jump, and shot put) has a very strong negative correlation. This study falls under the category of sports psychology and focuses on sports performance in teenagers. Long-term improvement in performance. Considering that athletic achievement in Indonesia is inadequate, it appears that more research from other fields of sports science, such as biomechanics, physiology, nutrition, and so on, is still required, along with a more complex and specific discussion of the results of previous research as supporting data for renewal and can be implemented by practitioners in the field.

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Nothing to declare

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