

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

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ABSTRACT: This research aims to determine the correlation between self-efficacy and emotional regulation of fencing athletes and resilience through mental toughness, in order to help East Kalimantan fencing athletes, improve their performance in national competitions such as the PON Event (National Games Event). This research employed a correlational research method with a quantitative research design. The research employed SEM PLS analysis. The instruments used the Brief Resilience Scale (BRS), the Indonesian Version of the Mental Toughness Index (MTIid), the Emotion Regulation Questionnaire (IERQ4S), and General Academic Self-Efficacy (GASE). The data analysis used SPSS version 27 and SmartPLS 4. A total of 69 fencing athletes participated in this study, categorized by competition class and age, gender, competition experience, and training duration. Prior to the SEM PLS analysis, the data were processed by using a Normality Test to meet the requirements for SEM PLS. The results of the Measurement Model are declared valid and reliable, and they are deemed suitable for hypothesis testing using a Structural Model consisting of Path Coefficients, Indirect Effects, and R². The research findings reveal that the p-value of Self Efficacy and Resilience with and t test value of 0.027 and p value of 0.979, Emotional Regulation and Resilience with t test at 1.671 and p value at 0.096, Self-Efficacy and Resilience through Mental Toughness with t test at 0.750 and p value at 0.360 and Self Efficacy and Resilience through Mental Toughness t test at 0.915 and p value at 0.454. The conclusion of the research is the correlation between Self Efficacy and Resilience is not significant, then the correlation between Emotional Regulation and Resilience also shows no significance, the correlation between Self Efficacy and Resilience through Mental Toughness also shows no significance, while the last analysis is Emotional Regulation and Resilience through Mental Toughness also shows no significance. The insignificance of all research questions shows that Resilience does not have a strong effect on the independent variables of Self Efficacy and Emotional Regulation as well as on the mediation of Mental Toughness. Researchers assume that other variables influence resilience.

KEYWORDS: Resilience, Emotional Regulations

I. INTRODUCTION

Competition is the important element whom development athlete, that not only on aspect physical but to mental and strategy. According to Nurhadi et al. (2023) show that participant on competition had significant contribution for increased perform athlete long term and short term. Athlete whom had active attend competition, it has term higher self-confident and problem solving when it gets pressure than not (Jekauc et al., 2023). Furthermore, experience championship for athlete help growth skill technic and also help improve character and mentality athlete. Sun et al. (2025) had found that athlete have been participant join competition shown increase significant perform than athlete only practice without apply championship. Furthermore, that show experience directly follow the match really important for development skills. However, competition as always bring high pressure that lead for any emotional response. Athlete often face pressure from coach, family and media which can affect dramatic stress and it lead to their mental health (Lane, 2024). Beside, athlete need emotional support from coach and environment supporting around athlete really important for help athlete solve the problem. The ability to bounce and adaptation after difficulties, Resilience important role for sports. According to Leys et al. (2020) had defined that resilience is processing dynamic involving interaction both of individual and environment. In addition, resilience in sports can detect ability athlete for good perform in competition after injure or failure. Fauzi et al. (2024) said athlete with level resilience higher that athlete have been performed better for long term (Chrétien et al., 2024).

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

Additionally, further research believe that athlete have been supported strongly, it will impact to get strongly resilience level (Simons & Bird, 2023). Resilience not just about ability individual but it will impact to support social (Zainuddin et al., 2023). Importance resilience for program practice whom help strengthen mental athlete. Overall, introduction studies which is conducted in Pekan Olahraga Nasional (PON) XXI Aceh- Sumatra Utara 2024 represent fencer athlete have problem with emotional control, less confident and have no capable to solve anxiety when perform match against opponent more superior. In summary, Resilience fencer still not optimal what can impact maturity psychological and achievement athlete. According to Fonseca et al. (2020) identify term athlete with good resilience such as ability control their feeling, understand situation and toughness face problem. These really important build resilience fencers with consider factor affecting namely self-efficacy, mental toughness and emotional regulation. Mental toughness, self-efficacy and emotional regulation are variables could affect resilience. Mental toughness gets correlation with ability individual for focus even it should face pressure (Southwick et al., 2014). Resilience involving social supports and skill coping (Iacoviello & Charner, 2020). Research shown that individual had highly mental toughness term level of resilience significant grow and better (St Clair-Thompson & London, 2024) Mental Toughness as variabel mediator that have influence correlation of emotional regulation and self-efficacy with resilience. Athlete who have high mental toughness ability can mark with ability emotional regulation, optimism and good self-confidence whereas had contribution with resilience (Zaenudin et al., 2022).

The importance of resilience in training programs can strengthen athletes' mental health. A preliminary study conducted at the 21st National Games (PON) in Aceh, North Sumatra in 2024 showed that fencing athletes experienced difficulty controlling their emotions, lacked self-confidence, and were unable to overcome fear when competing against superior opponents. The findings identified suboptimal athlete resilience, which can impact their psychological maturity and performance. Interviews with East Kalimantan fencing athletes competing at the 21st PON in Aceh, North Sumatra revealed that when facing a tougher opponent and with a lower score, athletes felt hesitant and lacked confidence. This was further compounded by the imagining of the cheers from supporters and coaches, which could lead to a loss of emotional control during the match. Research by Fonseca et al. (2020) identified characteristics of athletes with good resilience, such as the ability to control emotions, understand situations, and be resilient in the face of adversity. Interviews indicated that building athlete resilience is crucial, considering factors such as self-efficacy, adaptability, and emotional regulation. Furthermore, an interview with an East Kalimantan fencing coach echoed previous athletes' sentiments. He emphasized the importance of mental toughness when facing strong opponents or chasing a losing score. Victory stems not only from good technique, but also from the ability to face and recover from adversity. A great athlete must possess the ability to solve their own problems and not give up in any situation.

The findings of this interview are known in psychology as resilience, or the ability to bounce back from adversity. Resilience in the context of sport is defined as an individual's ability to bounce back and adapt after facing pressure, challenges, or failure. The findings indicate that the emergence of adversity stems from the ability to survive. The world considers that, where athletes are often faced with intense competitive situations and high mental pressure, resilience is a key factor in achieving optimal performance (Salfield & Daniela I, 2020).

II. RESEARCH OBJECTIVES

The research question which are needed to achieve this study is, what is the relationship between self-efficacy, emotional regulation, with resilience and how the mediator of mental toughness on the relationship of self-efficacy and emotional regulation with resilience? This provides an overview of the research objectives. The research questions are following:

1. Investigate relationship between self efficacy and resilience
2. Investigate relationship between emotional regulation and resilience
3. Analyses the effect of mental toughness as mediator between self efficacy and resilience
4. Analyses the effect of mental toughness as mediator between emotional regulation and resilience

III. METHOD

This study uses Structural Equational Modeling (SEM) based on Partial Least Squares (PLS). SEM PLS was first developed by Herman Wold (1982) and is a second-generation multivariate analysis that can analyze statistical data simultaneously for all variables and indicators.

A. Participant

This study employed a purposive sampling technique, in which participants were selected based on specific criteria relevant to the research objectives. The sample consisted of fencing athletes from East Kalimantan in 2024 who met the following inclusion

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

criteria: (1) registered fencing athletes, (2) having participated in at least regional-level competitions, and (3) officially representing East Kalimantan as athletes. From a total population of 117 fencing athletes, 61 athletes met the established criteria and were included as the research sample. The selected sample was considered representative of the population characteristics in accordance with the focus of the study.

B. Procedure

The Research used instrument Brief Resilience Scale adopted Fung (2020), Mental Toughness Index of Indonesia Version MTIid adopted Putra et al. (2024), The Emotional Regulation Questionnaire for Indonesia Sport Settings (IERQ4S) Jannah et al. (2023), General Academic Self Efficacy Indonesia version adopted Rismawati (2025) for share to Respondent. All respondent fills the questionnaires with google form. Furthermore, college the data, that will analyses with Normality test before using SEMPLS for create strong reason used SEMPLS for analyses the data. First, Indicator of construct count with Measurement Model to find result of Validity Convergent such as AVE and Outer loading, Reliability Test of Cronbach's Alpha and Composite Reliability, and Discriminate Validity. In additionally, after the data pass with the regulation of SEM PLS, the data allowed count to Structural Model to looking for the result of direct analyses, correlation mediator of construct and the power of construct with R^2 .

C. Statistic Analyses

Smart PLS Gen 4 using for analyses SEM PLS. SPSS 27 was used for demographic sample with Descriptive Statistics were represented as frequency with percentage also for normality test with assumptions were checked with Skewness test to find reason used SEM PLS as method analyses data. Moreover, analyses SEM PLS will had twice step, first, Measurement model with Validity Convergent such as AVE and Outer loading, Reliability Test of Cronbach's Alpha and Composite Reliability, and Discriminate Validity. Second, the data pass with the regulation of SEM PLS, the data allowed count to Structural Model to looking for the result of direct analyses, correlation mediator of construct and the power of construct with R^2 .

IV. RESULT

A. Demographic

The demographic part of the study involves analyzing participant fencer East Borneo in terms of their gender, classification class age, classification class sword, and their relevant factors.

i. Fencer Gender

The table 1 provide the detail of gender fencer who participated in this study.

Table 1: Fencer Gender

Scale	Frequency	Percentage
Gender		
Female	45	65.2
Male	24	34.8
Total	69	100

SPSS 27 Result

The Frequency distribution of gender among fencer east Borneo in this study is shown the biggest domination is woman with 45 participants and 65.2% and Man with 24 and 34.8%.

ii. Classification Class Age

Table 2 provides details of Classification Class Age Fencer with show the frequency and percentage.

Table 2: Classification Class Age

Scale	Frequency	Percentage
Classification Class Age		
Pra Cadet (Under 14 Years)	13	18.8
Cadet (15-17 Years)	33	47.8
Junior (18-20 Years)	13	18.8
Senior (More than 21 Years)	10	14.5
Total	69	100

SPSS 27 Result

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

Table 2 shown the highest of classification class age is Cadet with 33 fencers and 47.8% considerably. Moreover, Pra cadet and junior represent same result with 13 fencers and 18.8%. Last scale, Senior with 10 fencers and 14.5%.

iii. Classification Class Sword

Table 3: Classification Class Sword

Scale	Frequency	Percentage
Classification Class Sword		
Epee	23	33.3
Foil	20	29
Sabel	26	37.7
Total	69	100

SPSS 27 Result

Table 3 presents frequency of classification class sword. Sabel the most dominated participant with 26 fencers of 37.7%. In Additional, Foil and Epee have closed result with 20 (29) and 23 (33.3%).

iv. Sport's Involvement

Table 4: Sport Involvement

Scale	Frequency	Percentage
Sport's Involvement		
More than 2 years	48	69.6
Less than 2 years	21	30.4
Total	69	100

The table presents the distribution of respondents based on their duration of involvement in sports. The majority of respondents have been involved in sports for more than 2 years, accounting for 48 individuals or 69.6% of the total. A smaller portion of the group, consisting of 21 individuals (30.4%), has been involved in sports for less than 2 years.

v. Level Events

Table 5: Level Events

Scale	Frequency	Percentage
Level Events		
Region	36	52.2
National	30	43.5
International	3	4.3
Total	69	100

This table illustrates the highest level of competition or events that the respondents have participated in. Regional Level, more than half of the participants, specifically 36 individuals (52.2%), have completed at the Region level. National Level, a significant portion of the group, consisting of 30 individuals (43.5%), has reached the National level of competition. Last, International Level, only a small minority of the participants, totaling 3 individuals (4.3%), have experience at the International level.

B. Normality Test

Based on the results of the descriptive statistical analysis conducted using SPSS, the data distribution indicates that the assumption of normality was not fully satisfied.

Table 6: Descriptive Statistic

Construct	N	Min	Max	Mean	SD	Skewness	Kurtosis
Resilience	69	1	5	3.06	0.74	0.249	-0.074
Mental Toughness	69	1.5	5	3.70	0.62	-0.605	2.531
Self Efficacy	69	1.3	5	3.48	0.68	0.062	-0.935
Emotional Regulation	69	2	5	3.51	0.79	-0.183	0.476

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

The findings reveal that the Mental Toughness and Emotional Regulation construct not normal. Although the other constructs Resilience and Self-Efficacy demonstrate skewness normal distribution, the overall data suggest deviations from univariate normality and raise concerns regarding multivariate normality. Therefore, this study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS. PLS-SEM does not require the data to be normally distributed and is well suited for studies with small to moderate sample sizes. Additionally, PLS-SEM is robust in handling data with non-normal distributions and is particularly appropriate for predictive-oriented research models involving latent constructs. Accordingly, the use of SmartPLS is considered methodologically appropriate and justified for analyzing the structural relationships among the constructs in this study.

C. Measurement Model

Evaluation of the Measurement Model was evaluated using PLS-SEM model to assess the relationship between latent constructs and their observed indicators. The measurement model analysis focused on examining the validity and reliability of the constructs before proceeding to the structural model evaluation. Measurement model consist with Convergent Validity, Composite Reliability, Discriminant Validity. The evaluation of the measurement model ensured that all constructs met the required validity and reliability criteria, thereby confirming the adequacy of the measurement instruments used in the study.

i. Convergent Validity

Convergent Validity was assessed by evaluating indicator loadings and the Average Variance Extracted (AVE). First, indicator loading must exceed 0.70 to ensure the construct explains more than half of its indicators' variance, if the result show that less than that, it should be delete. Table 7 represented several indicators of construct had been empty because the result of indicator loadings less than 0.70. Furthermore, an AVE value of 0.50 was used to confirm that constructs explained more than hal of the variance of its indicators. Table 7 had shown result AVE of construct more than 0.70. That mean all construct was valid.

ii. Indicator Loadings

Table 7 had shown the indicator loading of construct. The Resilience construct, four indicators (R1–R4) demonstrated satisfactory outer loading values ranging from 0.773 to 0.821, exceeding the recommended threshold of 0.70. All indicators showed statistically significant t-values (>2), indicating that each item significantly contributes to the construct. The AVE value of 0.629 exceeded the minimum criterion of 0.50, confirming adequate convergent validity. Indicators R5 and R6 were excluded due to insufficient loading values and were therefore not retained in the final model. The Mental Toughness construct also demonstrated strong measurement properties. The retained indicators (M2, M4, M5, and M8) exhibited high outer loadings, ranging from 0.781 to 0.904, with all corresponding t-values well above the critical value of 2. Indicators with insufficient loadings (M1, M3, M6, and M7) were removed to improve the overall quality of the measurement model. For the Self-Efficacy construct, the retained indicators (S4–S10) showed outer loading values ranging from 0.720 to 0.834, all exceeding the minimum recommended threshold. The t-values for these indicators were significant, confirming indicator reliability. Indicators S1–S3 were excluded due to inadequate loading values. Similarly, the Emotional Regulation construct met the required criteria for convergent validity and reliability. The retained indicators (ER2–ER10) exhibited outer loadings between 0.719 and 0.886, with all t-values indicating statistical significance. Indicator ER1 was excluded due to insufficient loading.

iii. Average Variance Extracted (AVE)

AVE is calculated as a man of the square loading of each indicator associated with a construct. The acceptable threshold for AVE is 0.50 or higher. AVE value the threshold indicates that the construct explains variance of the items. Fornell and Lacker supported that AVE should be higher than 0.5, if the composite Reliability is higher than 0.6 then AVE 0.4 can also be accepted and considered adequate convergent construct validity. In table 7 shown that Resilience construct of the AVE value with 0.629 exceeded the minimum criterion of 0.50, confirming adequate convergent validity, in additionally, Mental Toughness of AVE value with 0.688 indicates that the construct explains more than 68% of the variance of its indicators, confirming strong convergent validity. Moreover, Self-Efficacy The AVE value of 0.615 indicates acceptable convergent validity. The last construct, emotional regulation with AVE value of 0.583 exceeded the recommended threshold of 0.50, confirming that the construct adequately captures the variance of its indicators.

iv. Reliability

Reliability was evaluated using Cronbach's Alpha and Composite Reliability (CR). Both metrics should yield values greater than 0.70 to confirm high internal consistency and indicated satisfactory internal consistency reliability of the constructs. The Table 7 presented the value Cronbach's Alpha and Composite Reliability of construct more than 0.70, this shown than all constructs was reliable.

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

v. *Cronbach's Alpha and Composite Reliability*

Table 7 represented value of Cronbach's Alpha and Composite reliability from the constructs. Resilience of the Composite Reliability and Cronbach's Alpha values were both 0.808, surpassing the recommended threshold of 0.70, thus indicating good internal consistency reliability. Furthermore, both Composite Reliability and Cronbach's Alpha values of mental toughness were 0.849, reflecting a high level of internal consistency. Surprisingly, the Composite Reliability and Cronbach's Alpha values of self-efficacy were both 0.910, indicating very high internal consistency reliability. Similarly, with self-efficacy, emotional regulation of the Composite Reliability and Cronbach's Alpha values were both 0.910, indicating very high internal consistency reliability.

Table 7: Convergent Validity and Reliability of Reflective Constructs

Constructs		Convergent Validity		Reliability	
		Outer Loading	AVE	Composite Reliability	Cronbach's a
	Indicator	>0.7	>0.5	>0.7	>0.7
Resilience (R)	R1	0.779	0.629	0.808	0.808
	R2	0.821			
	R3	0.773			
	R4	0.798			
	R5	--			
	R6	--			
Mental Toughness (M)	M1	--	0.688	0.849	0.849
	M2	0.904			
	M3	--			
	M4	0.788			
	M5	0.781			
	M6	--			
	M7	--			
	M8	0.84			
Self-Efficacy (S)	S1	--	0.615	0.899	0.899
	S2	--			
	S3	--			
	S4	0.834			
	S5	0.806			
	S6	0.775			
	S7	0.745			
	S8	0.83			
	S9	0.736			
	S10	0.72			
Emotional Regulation (E)	ER1	--	0.583	0.91	0.91
	ER2	0.725			
	ER3	0.719			
	ER4	0.788			
	ER5	0.786			

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

ER6	0.743
ER7	0.77
ER8	0.886
ER9	0.723
ER10	0.72

vi. Discriminant Validity

Discriminant Validity had evaluated to ensure that each construct is empirically distinct from other constructs in the model. This is tested using the Fornell-Larcker Criterion or the Heterotrait-Monotrait Ratio (HTMT), where values should ideally be below 0.85 or 0.90. Also, a construct was considered to have adequate discriminant validity when the square root of its AVE was greater than its correlations with other constructs, and when indicator loadings on their associated constructs were higher than those on other constructs.

vii. Fornell-Larcker Criterion

Fornell-Larcker Criterion ensure that each latent construct in the research model is empirically unique and does not capture the same phenomena as other constructs, discriminant validity was assessed using the Fornell-Larcker Criterion.

Table 8: Fornell-Larcker Criterion

Constructs	E	M	R	S
E	0.764			
M	0.772	0.829		
R	0.580	0.552	0.793	
S	0.588	0.541	0.366	0.784

According to this Table 8, analysis of results Construct M, the square root of the AVE for construct M is 0.829, which is higher than its correlation with construct E (0.772), R (0.552), and S (0.541). Construct R, the diagonal value for R is 0.793, exceeding its correlations with E (0.580), M (0.552), and S (0.366). Construct S, the square root of the AVE for S is 0.784, which is significantly higher than its correlations with other variables. Construct E, while the diagonal value for E is 0.764, there is a slight overlap as its correlation with construct M (0.772) is marginally higher than its own square root of AVE.

Overall, the majority of the constructs (M, R, and S) satisfy the Fornell-Larcker Criterion, indicating robust discriminant validity. The constructs are sufficiently distinct from one another, ensuring that the structural model analysis can proceed reliably.

viii. Heterotrait-Monotrait (HTMT) Analysis

In addition to the Fornell-Larcker criterion, this study employed the Heterotrait-Monotrait Ratio (HTMT) to evaluate discriminant validity. The HTMT is currently considered a more reliable and rigorous metric for detecting lack of distinctness between constructs in variance-based SEM.

Table 9: HTMT

Constructs	E	M	R	S
E				
M	0.854			
R	0.633	0.631		
S	0.633	0.571	0.394	

The HTMT ratio was assessed, as it is considered a more rigorous criterion in PLS-SEM. Table 9 shown all HTMT values were found to be below the critical threshold of 0.90. Specifically, the highest ratio recorded was between constructs M and E at 0.854, which remains within the acceptable range for establishing discriminant validity.

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

D. Structural Model

i. Direct Relationship

In this sub section, it investigates the direct relationship between the independent variable of self-efficacy and emotional regulation through mediator variable of mental toughness and dependent variable of resilience. This section provides the results of their first research question of study, which is H2 Self-efficacy has an influence on mental toughness. Based on the analysis Table 10, the following results H1 (S→R) with $\beta=3.79$, P-value = 0.027, $t= 0.979$. The hypothesis is rejected that does not meet the required significance level. The direct analysis had demonstrated results indicate that self-efficacy does not have a significant effect on resilience. The structural model shows a path coefficient of $\beta = 0.004$, with a t-value of 0.979 and a p-value of 0.027, which does not meet the recommended significance threshold ($p < 0.05$; $t > 1.96$). Although the coefficient suggests a positive relationship, the effect is statistically insignificant. Therefore, the proposed hypothesis stating that self-efficacy positively influences resilience is rejected.

In additional, H2 (E→R) with $\beta=0.379$, P-value=1.671, $t=0.095$. The hypothesis is rejected that does not meet the required significance level. The direct analysis had demonstrated results indicate that emotional regulation does not have a significant effect on resilience. The structural model shows a path coefficient of $\beta = 0.379$, with a t-value of 0.095 and a p-value of 1.671, which does not meet the recommended significance threshold ($p < 0.05$; $t > 1.96$). Although the coefficient suggests a positive relationship, the effect is statistically insignificant. Therefore, the proposed hypothesis stating that emotional regulation positively influences resilience is rejected.

Table 10: Direct Path Coefficient

Hypo	Path	Original Sample (β)	T-Statistics	P-Values	Supported
H1	Self-Efficacy (S) – Resilience (R)	0.004	0.027	0.979	Rejected
H2	Emotional Regulation (E) – Resilience (R)	0.379	1.671	0.095	Rejected

Figure 1 given below, shows the statistical results of this study. The figure depicts the direct path analysis of relationship between the independent variables, mediator variable and dependent variabel used in this study.

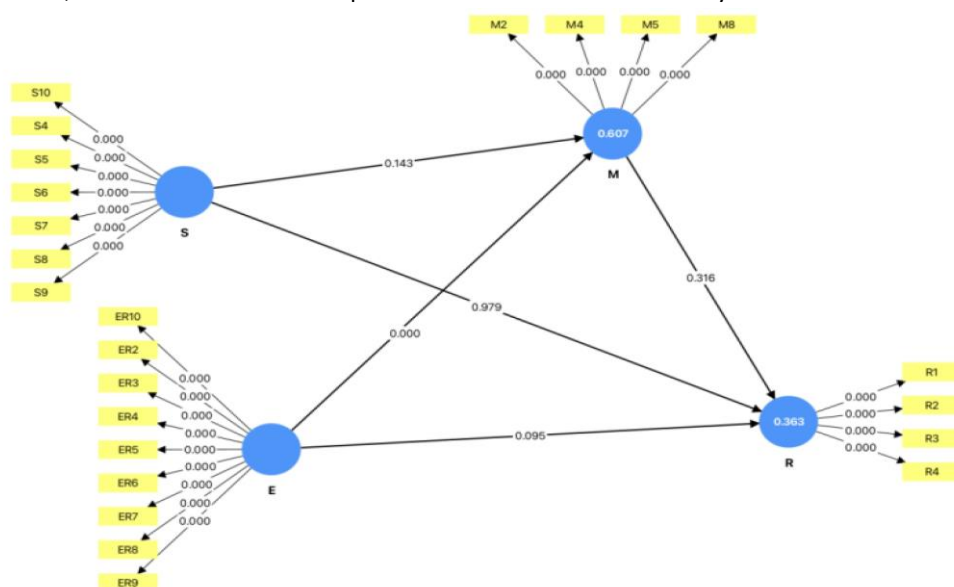


Figure 1 Direct Path Analysis

ii. Mediator Relationship

A mediator variable is a mechanism through which an independent variable influences a dependent variable. In this chapter, Mental Toughness was hypothesized to explain *how* Emotional Regulation and Self-Efficacy lead to increased Resilience. Since the path from Mental Toughness to Resilience was not significant, the mediation effect was not statistically supported.

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

Table 11: Indirect Effect

Hypotheses	Mediator Path	Original sample (O)	T statistics	P values	Decision
H3	S → M → R	0.034	0.750	0.454	Rejected
H4	E → M → R	0.178	0.915	0.360	Rejected

According to Table 11 Mediation Effects, the results for specific indirect effects indicate that Mental Toughness does not act as a mediator in this model. Such as H3 (S → M → R) with $\beta=0.034$, $P=0.454$, $t=0.750$. The results of the mediation analysis indicate that self-efficacy does not have a significant indirect effect on resilience through mental toughness. The indirect path coefficient ($\beta = 0.034$) is supported by a t-value of 0.750 and a p-value of 0.454, which do not meet the established significance criteria ($p < 0.05$; $t > 1.96$). Although the coefficient suggests a positive indirect relationship, the effect is statistically insignificant. Therefore, the hypothesis proposing that mental toughness mediates the relationship between self-efficacy and resilience is rejected.

H4 (E → M → R) with $\beta=0.178$, $P=0.360$, $t=0.915$. The results of the mediation analysis indicate that emotional regulation does not have a significant indirect effect on resilience through mental toughness. The indirect path coefficient ($\beta = 0.178$) is supported by a t-value of 0.915 and a p-value of 0.360, which do not meet the established significance criteria ($p < 0.05$; $t > 1.96$). Although the coefficient suggests a positive indirect relationship, the effect is statistically insignificant. Therefore, the hypothesis proposing that mental toughness mediates the relationship between emotional regulation and resilience is rejected.

iii. R Square

In this study, the coefficient of determination (R-square or R^2) is used to evaluate the explanatory power of the structural model in Partial Least Squares Structural Equation Modeling (PLS-SEM). R-square represents the proportion of variance in an endogenous (dependent) construct that is explained by its exogenous (independent) constructs included in the model. According to commonly accepted guidelines in PLS-SEM, R-square values of approximately 0.25, 0.50, and 0.75 can be interpreted as weak, moderate, and substantial levels of explanatory power, respectively. Therefore, the R-square value obtained in this study reflects the extent to which constructs such as Mental Toughness and Resilience collectively explain the variance of the endogenous variable. In the context of this research, a meaningful R-square value indicates that the proposed structural model has adequate explanatory capability, supporting the theoretical framework underlying the relationships between the studied psychological constructs. Consequently, R-square serves as an important indicator of the model's overall quality and its ability to predict outcomes within the research setting. In additional, R Square is the theoretical model (H1) of fits the data.

Table 12: R-Square

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics	P values
M	0.607	0.639	0.078	7.821	0.000
R	0.363	0.410	0.089	4.071	0.000

Regarding table 12, and H1 the theoretical model fits the empirical data only partially. While it strongly explains the development of Mental Toughness ($R^2 = 0.607$), it is less effective at explaining Resilience ($R^2 = 0.363$). This indicates that the proposed pathways through Mental Toughness as a mediator do not fully represent the empirical reality for this group.

V. DISCUSSION

A. Analyses Correlation Self Efficacy with Resilience

Self-efficacy is an individual's belief in their ability to organize and carry out actions to achieve specific goals, influenced by their mindset (Gamlem & Vattoy, 2022), motivation level (Barnett, 2014), persistence in the face of adversity, and their response to stress and failure (Waddington, 2023). This definition is related to resilience, which is an individual's ability to survive, adapt, and bounce back from failure. Research shows that the relationship between self-efficacy and resilience is insignificant. Therefore, self-efficacy does not have a strong relationship with resilience in East Kalimantan fencing athletes. These results indicate that belief in one's own abilities is not directly related to an individual's ability to survive and bounce back from defeat, pressure, or difficulties encountered in competitive sports activities.

Based on Bandura's self-efficacy theory, an individual's belief in their ability to consciously manage and execute actions requires specific goals, one of which is increasing the belief in their ability to recover from failure. This theory is supported by Abdolrezapour et al. (2023) stated that self-efficacy has a strong influence on resilience by providing additional motivation and

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

academic improvement through knowledge to be more courageous and confident, thus increasing self-efficacy and resilience. However, this opinion is limited to school-age students, whereas this study examines the influence of self-efficacy on resilience in fencing athletes. This is also supported by research by De et al. (2015), who stated that self-efficacy levels are influenced by a student's academic level and understanding. In this case, it can be concluded that the results of the research hypothesis rejecting the relationship between self-efficacy and resilience are influenced by the level of understanding, age, and certain factors. Therefore, external assistance is needed, such as increasing knowledge and needing support from family and others, to have strong self-efficacy and can increase resilience. It is hoped that athletes can deliver their best performance and have an understanding of learning from failure. Resilience, as understood, is an individual's ability to recover from stressful situations and still exhibit positive cognitive function (Faridah et al., 2025), but it has not yet shown a strong relationship with self-efficacy. In this case, resilience is a multidimensional variable and is influenced by many factors, unlike self-efficacy, which is influenced by personal factors (Amelia & Febriani, 2022). Resilience can be influenced by environmental and social factors. In the world of fencing, resilience is likely influenced by factors such as external support (such as coaches, teammates, and family), the ability to manage stress during competition, competition experience, and the process of maturing in a positive and evolving realm. Factors that further strengthen resilience and self-efficacy need to be reexamined so that research on the relationship between resilience and self-efficacy can be further developed. This is supported by research conducted by Riswanto & Lidiawati (2021), which showed that the strength of the relationship between self-efficacy and resilience was only 30%, with 70% influenced by other factors. Therefore, the relationship between resilience and self-efficacy needs to be considered, including gender differences, differences in experience, and improvements in cognitive function, to establish a strong relationship between resilience and self-efficacy.

Therefore, although the relationship between self-efficacy and resilience in this study was relatively weak, sampling based on gender, experience, and cognitive understanding should be considered to ensure self-efficacy can influence resilience.

B. Analyses Correlation Emotional Regulation with Resilience

Similar to Self-Efficacy, the study results show an insignificant relationship between Emotional Regulation and Resilience. Regulation, as intended, is the ability to control emotions, which can provide the power to bounce back from defeat and failure. In this case, Regulation as an independent variable is able to provide resilience strength as a dependent variable. These results indicate that an individual's ability to manage and control emotions does not have a direct relationship with the level of Resilience. This is in contrast to what has been conveyed by Plohl et al. (2026) there is a positive relationship between Emotional Regulation and Resilience. However, this relationship is influenced by differences in influences, especially age, experience, and cognitive level. In addition, Resilience is influenced by the difficulty factor of regulating emotions; the lower the difficulty of Emotional Regulation, the higher the Resilience score (Arici-Ozcan et al., 2019). This supports previous research that influences Emotional Regulation and Resilience are factors such as age, experience, and understanding or cognitive level. Carstensen (1992) socioemotional selectivity theory explains that emotional regulation is strongly influenced by age; the more mature a person is, the wiser they are in managing their emotions. Under certain conditions, age does not determine a person's level of maturity; it may be influenced by the level of experience and understanding gained through each individual's life journey, which has a different way of thinking (Yu et al., 2025). Furthermore, limited time encourages more mature individuals to avoid searching for specific meanings and instead focus on maintaining well-being, thus enabling them to better regulate their emotions (Livingstone & Isaacowitz, 2018). Therefore, the conclusion of this discussion reinforces that resilience is a psychological component influenced by numerous factors (Farchi & Peled-Avram, 2025). The demographic results revealed significant age bias and level of competitive experience, significantly influencing levels of emotional regulation and resilience.

Therefore, low levels of emotional regulation contribute to low resilience, as resilience assessments are useful for determining a person's ability to bounce back from adversity. The low Emotional Regulation score, influenced by several previous factors, also suggests that resilience is influenced by factors other than Emotional Regulation (Troy et al., 2022). Therefore, resilience is a complex variable influenced by external factors, not just Emotional Regulation. Emotional Regulation is an individual's ability to control, evaluate, and modify emotional reactions to suit the needs of the situation (Greenberg, 2021). Emotional Regulation is a crucial factor in helping individuals cope with stress and psychological pressure. However, resilience is dynamic and influenced by many factors, unlike Emotional Regulation, which is influenced by an individual's cognitive level, which is predominantly internal. In contrast, resilience is influenced by both internal and external factors.

In sports, resilience is strongly supported by social factors such as social support from coaches and teammates, competitive experience, internal motivation, and field conditions during competition, not solely determined by individual factors, one of which is Emotional Regulation.

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

C. Analyses The Effect of Mental Toughness as Mediator Between Self Efficacy and Resilience

Based on the results of the research analysis, it was found that the relationship between Self-Efficacy and Resilience through Mental Toughness was statistically rejected. This indicates that Mental Toughness is not yet capable of acting as a mediating variable linking Self-Efficacy and Resilience in East Kalimantan fencing athletes. An athlete's level of confidence in their own abilities is indirectly related to their ability to withstand and rebound from pressure through Mental Toughness. Theoretically, Self-Efficacy is understood as an individual's belief in their ability to organize and execute the actions necessary to achieve a specific goal, while Mental Toughness refers to an individual's psychological ability to remain focused, consistent, and resilient in the face of pressure.

Meanwhile, Resilience describes an individual's ability to adapt positively and bounce back from difficult situations. Although these three variables are often assumed to be interrelated, the results of this study indicate that this relationship was not always significant in this study. The rejection of this mediation relationship suggests that Resilience in fencing athletes is likely more influenced by factors other than Self-Efficacy and Mental Toughness, such as social support from coaches and teammates, competition experience, and internal motivation. These factors can play a more dominant role in helping athletes cope with competitive pressure and recover from failure. This contrasts with what St Clair-Thompson & London (2024) reported in a relevant study, which stated a positive relationship between self-efficacy and resilience, contributing 60% to mental toughness. The large variable strength proves that self-efficacy, mental toughness, and resilience have a very strong influence. Similar to research on the assessment of mental toughness, self-efficacy, and resilience, Denovan et al. (2023) stated that self-efficacy, mental toughness, and resilience have a positive relationship on general factors, thus interconnecting in impacting an individual's influence. In this case, it can be concluded that the relationship between self-efficacy and resilience through mental toughness is mutually influential. When compared with previous research conducted by researchers, where the hypothesis was rejected, it can be assumed that the strength of self-efficacy in fencers is very weak, thus influencing the weakness of resilience and mental toughness. Therefore, the hypothesis was rejected due to low self-efficacy. Furthermore, self-efficacy is also influenced by experience level (Bergman et al., 2021), as many of the study respondents had less than two years of experience and few had international competition experience. Experience is crucial for developing athletes' self-efficacy to improve competition performance (Yang et al., 2024). Experience provides indirect learning to train athletes to develop good mental toughness and resilience, thus having both direct and indirect effects on athlete performance.

Thus, the findings of this study reinforce the view that resilience is a complex and multidimensional variable, which cannot be explained solely through a single psychological pathway. It can also be influenced by low athlete self-efficacy, which in turn influences resilience through mental toughness.

D. Analyses The Effect Of Mental Toughness As Mediator Between Self Efficacy And Resilience

The results of the relationship between Emotional Regulation and Resilience through Mental Toughness were declared statistically insignificant, so the hypothesis stating a relationship cannot be accepted or rejected. This finding indicates that Mental Toughness does not act as a mediating variable in explaining the relationship between Emotional Regulation and Resilience in East Kalimantan fencing athletes. Emotional Regulation is understood as an individual's ability to manage, control, and express emotions adaptively in various situations, including stressful ones (Greenberg, 2021). Meanwhile, Mental Toughness is often viewed as a psychological ability that enables individuals to remain focused, stable, and resilient when facing competitive demands (Strycharczyk et al., 2020). Resilience, on the other hand, describes an individual's ability to endure, adapt, and bounce back from adversity or failure. Although these three variables are conceptually assumed to be interrelated, the results of this study indicate that this relationship did not significantly develop in the context of this study.

The insignificant mediation of Mental Toughness on athletes' Emotional Regulation, which did not lead to improvements in Resilience, aligns with the research of (Wu et al., 2022) stated that the relationship between resilience and emotional regulation only had a 44% correlation, with 56% still influenced by other variables. These results are supported by research by Young et al. (2026), who found no significant relationship between mental toughness and resilience, either based on gender or athlete ranking based on competitive experience. This study contradicts sports psychology research that found this influence on athlete well-being and performance. Similarly, research by Martono et al. (2025) found that mental toughness mediation did not significantly influence resilience. Therefore, it can be concluded that mental toughness mediation has no effect on athlete resilience, even at the gender and competitive experience levels.

Meanwhile, research by Jannah et al. (2025) found that the relationship between emotional regulation and mental toughness had a 77% correlation, indicating a very strong correlation. However, the effect of emotional regulation on resilience through mental toughness was not significant. It can be concluded that the relationship between Resilience and Emotional Regulation through

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

Mental Toughness has a weak influence, but Emotional Regulation and Mental Toughness have a very strong relationship. Therefore, to build Resilience requires other variables outside of Mental Toughness and Emotional Regulation. The insignificant mediating role of Mental Toughness indicates that the athlete's Regulation ability is not directly related to the level of Resilience through strengthening Mental Toughness. This indicates that athlete Resilience is likely more influenced by other factors, such as social support from coaches and teammates, competitive experience, internal motivation, and the conditions of the training and competition environment (Sarkar & Fletcher, 2014). The results of this study confirm that Resilience is a complex and multidimensional variable, which cannot be explained only through a particular psychological pathway, including Regulation and Mental Toughness.

VI. CONCLUSION

Based on the research results and discussion regarding the relationship between Self-Efficacy, Emotional Regulation, Mental Toughness, and Resilience in East Kalimantan fencing athletes, the following conclusions can be drawn:

1. The relationship between Self-Efficacy and Resilience showed no significant results. This finding indicates that athletes' confidence in their own abilities is not directly related to their ability to withstand and recover from stress, failure, or competitive situations. This weak relationship is influenced by several factors, such as differences in age, level of competitive experience, and the athletes' cognitive understanding. Self-Efficacy in the fencing athletes in this study tended to be still developing and required external support, such as coaching, competitive experience, and social support, to contribute more strongly to Resilience.
2. The relationship between Emotional Regulation and Resilience also showed no significant results. This indicates that athletes' ability to manage and control emotions is not sufficient to directly increase resilience or psychological resilience. Emotional Regulation is predominantly influenced by internal factors such as age and cognitive level, while Resilience is influenced by a combination of internal and external factors, including competitive experience, social support, and the training environment. Thus, Emotional Regulation is not the sole determinant of Resilience in athletes.
3. Mental Toughness was not proven to act as a mediator in the relationship between Self-Efficacy and Resilience. These results indicate that athletes' relatively low self-confidence, coupled with limited competitive experience, has not been able to develop mental toughness strong enough to foster Resilience. This finding reinforces the assumption that athlete Resilience is not only built through internal psychological pathways, but also through competitive experience and long-term learning processes.
4. The relationship between Emotional Regulation and Resilience through Mental Toughness was also found to be insignificant. Although Emotional Regulation has a strong relationship with Mental Toughness, this strengthening has not been able to have a significant indirect impact on Resilience. This suggests that increasing Resilience requires the involvement of other variables beyond Emotional Regulation and Mental Toughness, such as support from coaches, teammates, intrinsic motivation, and the training and competition environment.

Overall, the results of this study confirm that Resilience in East Kalimantan fencing athletes is more influenced by external factors and competitive experience than by internal psychological factors alone. Therefore, the development of athlete resilience needs to be carried out comprehensively through a multidimensional approach that involves psychological and social aspects, competition experience, and long-term coaching quality.

VII. SUGGESTION

The findings of this study reinforce the view that resilience is a complex variable and cannot be explained solely by a single psychological factor, including self-efficacy and emotional regulation. Furthermore, the insignificant mediation relationship indicates that resilience in fencers is likely more influenced by factors beyond self-efficacy, emotional regulation, and mental toughness, such as social support from coaches and teammates, competitive experience, coping strategies, and internal motivation. These factors can play a more dominant role in helping athletes cope with competitive pressure and recover from failure. Therefore, developing resilience in East Kalimantan fencers needs to be done comprehensively by considering various psychological, social, and environmental aspects, rather than solely focusing on individual emotional regulation abilities.

Analysis on the Fencing Athletes' Resilience on the Emotional Regulation and Self Efficacy through Mental Toughness

VIII. LIMITATION RESEARCH

The strength of the resilience variable, based on the R2 value, indicates that there are still other influences outside the model. This is evident from the R-Square value of 0.363, which indicates that the strength of Self-Efficacy and Emotional Regulation through Mental Toughness is not yet strong enough to influence Resilience.

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