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## Strengthening female teenagers resilience through physical fitness: The beneficial effects of physical activity enjoyment and routines

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### Abstract

Recent studies show that the physical fitness and personal resilience of Indonesians tend to be poor. Indicators of female's physical fitness tend to be poorer than male. This research focuses attention on female teenager's as a vulnerable group both in physical fitness and personal resilience. This study aimed to investigate the relationship between physical activity, physical activity enjoyment, physical fitness and resilience among female high school students in Indonesian. The results revealed a positive correlation between physical activity and physical fitness, indicating that higher activity levels were associated with better fitness. Similarly, a positive correlation was found between physical activity and activity enjoyment, suggesting that those who enjoy physical activity engage in it more frequently. Additionally, physical activity enjoyment and physical fitness were positively correlated with personal resilience. However, no significant correlation was found between physical activity and personal resilience or between activity enjoyment and physical fitness. The result also showed that there is a 26% contribution of physical culture to personal resilience. The study concluded that physical fitness and physical activity enjoyment are linked to better levels of resilience, indicating that interventions promoting physical activity and enhancing enjoyment could be beneficial in improving resilience among female teenagers.

**Keywords:** Physical activity, physical activity enjoyment, physical fitness, resilience, female teenagers

### 1. Introduction

Argentina's victory in the world cup 2002 was not an easy win. Losing to Saudi Arabia in the first match didn't bring them down. With great resilience, Argentina came out as the winner. Without adequate physical fitness, technical skills will not have a significant contribution to success. However, without resilience in facing challenges and defeats, as well as perseverance in attacking until the end of the match, technical skills and physical fitness will also not lead to victory.

Physical activity is one of the various methods to develop resilience, as it has been demonstrated that physical activity can result in resilience<sup>[1-4]</sup>. Physical activity is known to directly affect a person's mood. A person can feel enjoyment right after doing physical activity<sup>[5]</sup>. As stated in the theory of Edward Thorndike, any behavior that is followed by pleasant consequences is likely to be repeated<sup>[6]</sup>. Thus, a person who feels enjoyment in doing physical activity tends to repeat the action. Repeated physical activity will generate in physical fitness<sup>[7]</sup>. Physical fitness contributes to resilience as it is linked to numerous qualities and characteristics essential for resilience<sup>[8]</sup>. Thus, it is known that physical activity contributes to resilience through physical fitness and physical activity enjoyment.

Beside contributing to resilience, there are many benefits of physical activity especially in children and teenagers aged 5-17 years old, such as improving physical health and mental health, improving academic performance and helping maintain a healthy weight<sup>[9, 10]</sup>.

Although resilience plays a big part in a person's life, a study conducted by the psychology department of the University of Indonesia reveals that the resilience of Indonesian people is poor. When faced with challenging situations that greatly affect them, individuals who struggle with pressure or pain tend to have a low tolerance for such circumstances and often display pessimism regarding the future<sup>[11]</sup>.

The most recent available global comparative estimates from 2010 indicate that worldwide, 23% of adults and 81% of adolescents (aged 11–17 years) do not meet the WHO global recommendations on physical activity for health [10]. In Indonesia, a study revealed that the physical fitness of Indonesian people is very poor with 76% of the people are in the category of being unfit. The Youth and Sports Department also stated that the degree of physical fitness in Indonesia is still poor with only 0.14% are in the very good category [12].

Adolescents, who are usually high school students, are getting ready for the upcoming phase of their lives. They must be equipped with the tenacity to confront life's obstacles, such as transitioning into adulthood and learning to fend for themselves. By developing resilience in high school, students can better equip themselves to handle the challenges of college and achieve success in their academic and personal goals. Resilience can also be a key factor that helps vocational school students to stay motivated and continue their job search even when they face obstacles and difficulties.

In addition, female students especially, have a more significant role to play. Apart from getting ready for their crucial role as mothers, women today are also assuming positions that were once considered exclusive to men. The number of women taking on leadership roles and making important decisions is increasing. Developing resilience can empower women to handle these obstacles, surmount challenges, attain their aspirations, safeguard their mental and physical well-being, and flourish in all aspects of their lives.

When compared between men and women, many studies reveal that the physical activity levels of men are higher than women [13-15]. However, it is found that women are more resilient [16-18] and live longer overall [19].

Both physical fitness and resilience play an important role in a person's life. Whereas physical fitness can increase

general health and well-being, resilience contributes to a person's psychological fitness. [2]

There have been many studies linking physical culture and personal resilience [3, 8, 20-22]. However, the relationship between physical activity, physical fitness, physical activity enjoyment and resilience has not been clarified. Therefore, a study is needed to clarify the relationship between the variables to see if the relationships between the variables (physical activity, physical activity enjoyment, physical fitness, and personal resilience) are real or spurious. This study aims to clarify the relationship between two of the variables when the influence of the other variables is statistically nullified and to know how meaningful the contribution of physical culture variables to the personal resilience is.

This research study is significant because it will help to understand which of the physical culture contributes significantly to resilience and which do not. By understanding the relationship, the best way on how to improve resilience through physical culture can be understood.

## 2. Materials and Methods

### 2.1 Participants and Procedure

The population of this research is all senior high school students in Indonesia. A sample of 1969 female students was drawn using the snow-ball (reputational) sampling technique, ranging between 14 to 22 years old with a mean age of 16.48 years (SD=1.015). Among the participating students, 923 (46.9%) were living in the urban area and 1103 (46.44%) were living in the rural area. The distribution of the sample was 1139 (57.8%) students from general high school and 830 (42.2%) students from vocational high school. The distribution of students' sport preference was as follows: athletics, 163 (8.3%) and sport game, 1806 (91.7%). More details of the respondents' demographic data of this study are presented in Table 1.

**Table 1:** Demographic Characteristic of Respondents

School Type	Frequency	Percent
General Secondary School	1.139	57,8
Vocational School	830	42,2
Total	1.969	100,0
Urbanity	Frequency	Percent
Urban	923	46,9
Rural	1.046	53,1
Total	1.969	100,0
Sport Preference	Frequency	Percent
Athletic	163	8,3
Sport Game	1.806	91,7
Total	1.969	100,0

### 2.2 Instruments

This research analyzed existing data that were accessible from the Center of Physical Literacy and Educational Sports Study, Graduate School of Sports Education, IKIP Budi Utomo Malang, Indonesia. The instruments used in the data collection had been adapted by considering the psycho-socio-cultural aspects of Indonesian teenagers. All instruments have been tested for validity and reliability by the center. The instruments are valid (with factorial validity

test) and reliable (with Cronbach's Alpha test).

Physical activity routine was measured using the Exercise Questionnaire [23], physical activity enjoyment was measured using Physical Activity Enjoyment Scale [24], level of physical fitness was measured using the Perceived Physical Fitness Scale [25] and personal resilience was measured using the sub-set of the Indonesian version of READ [26].

**2.3 Statistical Analysis**

Researchers have studied the relationship between physical activity, physical fitness, physical activity enjoyment and personal resilience. However, this study is aimed to clarify those relationships. A partial correlation is a correlation between two variables from which the effects of another variable(s) have been removed, or statistically nullified [27]. Partial correlation is used to examine the relationship between two variables while controlling for the effect of one or more additional variables, also known as covariates.

The second order partial correlation technique, in which the effect of two other variables on the correlation between the two variables is statistically controlled, is applied in this study. As stated by Pedhazur [28], statistical control is particularly important when one is interested in the joint or mutual effects of more than one independent variable on a dependent variable, because one has to be able to sort out and control the effects of some variables while studying the effects of other variables.

To estimate the contribution of independent variables, this study also analyses the data with multiple-regression

technique, from which the R squared can be resulted. It allows the researchers to identify how one dependent variable (personal resilience) is affected by multiple independent variables (physical activity, physical activity enjoyment, and physical fitness) simultaneously.

These calculations were done by utilizing relevant software, namely: Microsoft Excel for coding and scoring, and calculation of direct and indirect effects, and Statistical Package for Social Sciences (SPSS) 25 for Windows Release for descriptive, bivariate correlation and regression analyses.

**3. Results & Discussion**

**3.1 Results**

The result of descriptive analysis of the research variables shows that level of physical activity mean (18.68) falls in the moderate category, physical activity enjoyment mean (75.42) is in the good category, level of physical fitness mean 36.98 falls in the moderate category and personal resilience mean (45.44) is in the good category (Table 2).

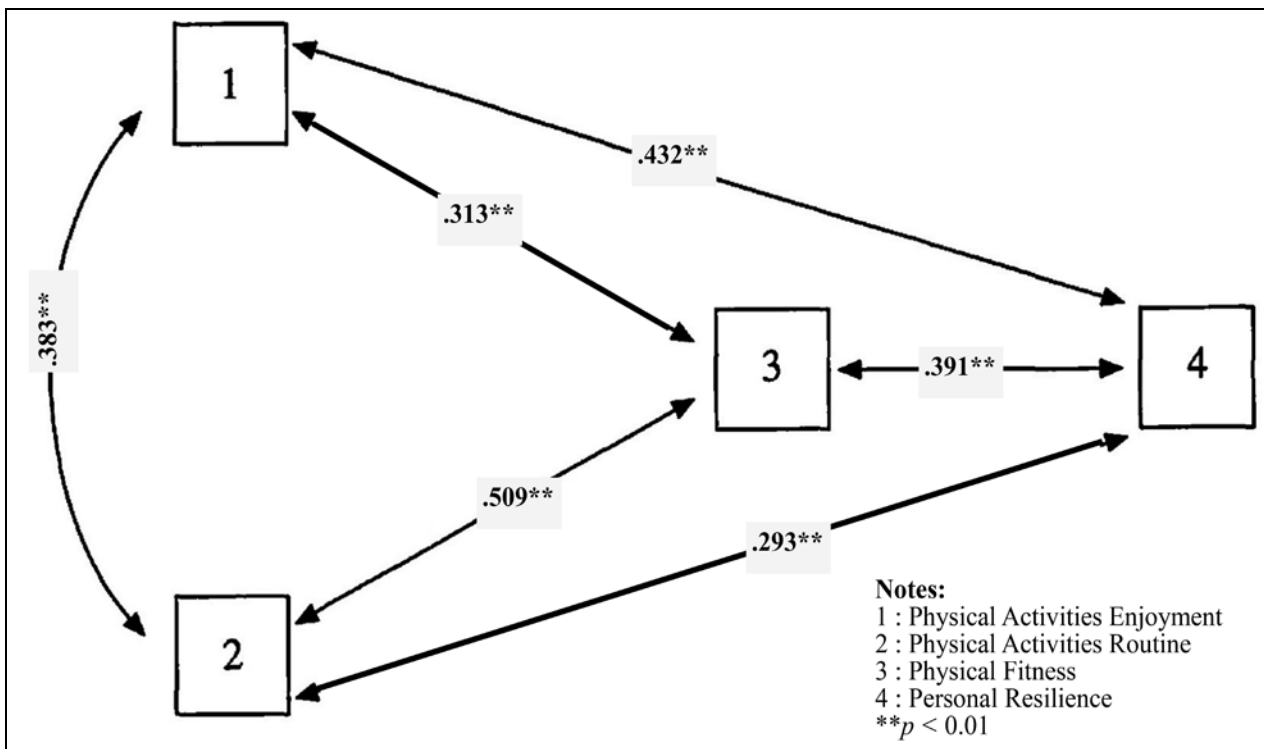
**Table 2:** Descriptive Statistics of the Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Physical Activities	1.969	7	35	18,68	6,138
Physical Activities Enjoyment	1.969	21	96	75,42	13,920
Physical Fitness	1.969	12	60	36,98	6,853
Personal Resilience	1.969	12	60	45,44	8,6044

The bivariat (zero order) correlation and the partial (second order) correlation between physical activity enjoyment, physical activity routine, physical fitness and personal resilience are presented in Table 3. From the result of bivariate correlation analysis, it can be seen that the

variables are positively and significantly correlated with each other.

The initial model of the relationship between the variables and the result of bivariate correlation analysis of the variables are presented in Figure 1.



**Fig 1:** The Initial Theoretical Model of the Physical of Sources Personal Resilience

Based on the results in Table 3, it is known that there is a 0.239 ( $p < .001$ ) correlation between physical activity enjoyment and level of physical activity. It is concluded that the relationship between physical activity enjoyment and level of physical activity is statistically significant even when the influence of level of physical fitness and personal resilience are statistically nullified.

If individuals find physical activity enjoyable, they are more inclined to consider it as an enjoyable experience, instead of a tedious task. Furthermore, they may actively seek new opportunities to participate in physical activities. This positive experience can also foster a greater feeling of mastery and confidence in their ability to perform physical tasks, which can result in more positive effects of physical activity.

**Table 3:** Zero-order Correlation and Second-order Correlation

Analyzed Variables	Correlation	
	Zero Order	Second Order
Physical Activities Enjoyment and Physical Activities Routine	.383**	.239*
Physical Activities Enjoyment and Physical Fitness	.313**	.042
Physical Activities Enjoyment and Personal Resilience	.432**	.338*
Physical Activities Routine and Physical Fitness	.509**	.423*
Physical Activities Routine and Personal Resilience	.293**	.024
Physical Fitness and Personal Resilience	.391**	.260*
Notes: N = 1.969 * $p < .05$ ; ** $p < .01$		

From the results in Table 3, it is known that there is a 0.042 ( $p > .001$ ) correlation between physical activity enjoyment and level of physical fitness. When the impact of level of physical activity and personal resilience are statistically controlled, there is no statistically significant correlation between physical activity enjoyment and physical fitness level.

The reason for the lack of significant correlation between physical activity enjoyment and physical fitness may be due to the fact that physical activity enjoyment does not directly contribute to physical fitness, but rather it influences physical fitness through physical activity. Physical fitness cannot be achieved without engaging in physical activity. Simply enjoying physical activity alone is not sufficient to contribute to physical fitness.

The results in Table 3 indicate a statistically significant correlation of 0.338 ( $p < .001$ ) between physical activity enjoyment and personal resilience. Meaning that there is a significant relationship between physical activity enjoyment and personal resilience when the influence of level of physical activity and physical fitness level are statistically controlled.

One possible explanation for the significant correlation between physical activity enjoyment and personal resilience is that both enjoyment and resilience have a psychological basis. An increase in enjoyment of physical activity may also positively influence an individual's personal resilience. From the results, it is known that there is a 0.423 ( $p < .001$ ) correlation between level of physical activity and level of physical fitness. Therefore, it is concluded that the relationship between level of physical activity and level of physical fitness is statistically significant when the influence of physical activity enjoyment and personal resilience are statistically nullified.

Engaging in regular physical activity, such as exercise or

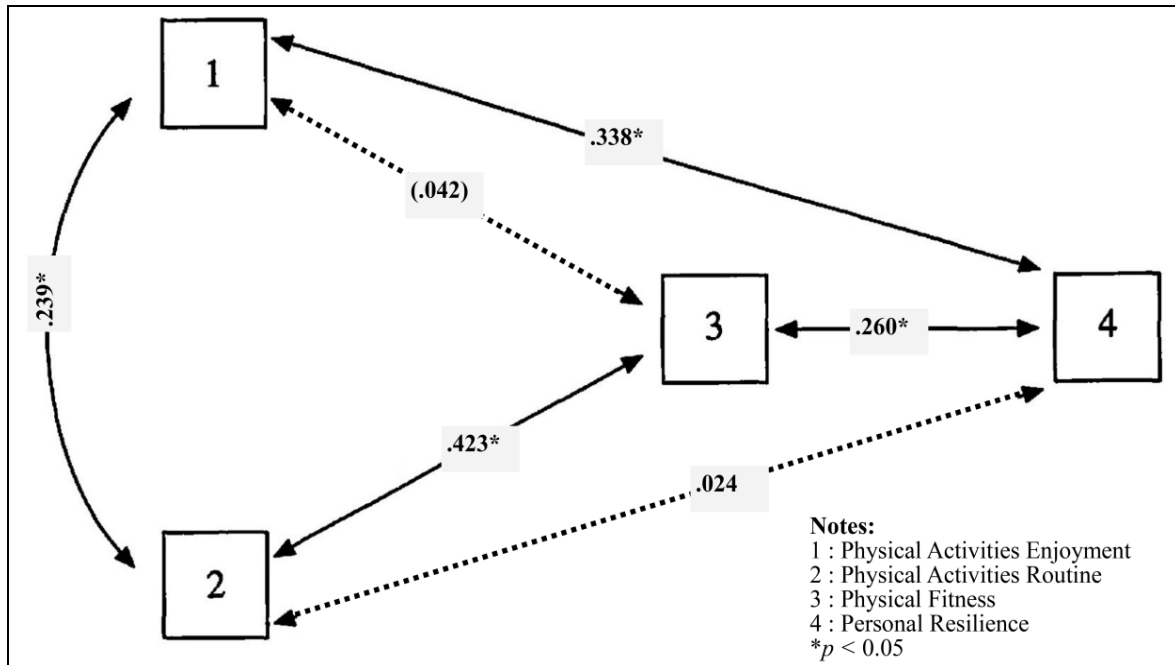
sports, can improve one's physical fitness level by increasing muscle strength, endurance, and cardiovascular health. Additionally, physical activity can help to maintain a healthy body weight and reduce the risk of chronic diseases such as diabetes, heart disease, and some cancers. However, the exact nature and strength of the relationship between level of physical activity and physical fitness may vary depending on individual factors such as age, health status, and the specific type of physical activity performed.

The result shows that there is a 0.024 ( $p > .001$ ) correlation between level of physical activity and personal resilience. It is concluded that the relationship between level of physical activity and personal resilience is not statistically significant when the influence of physical activity enjoyment and physical fitness are statistically nullified.

Research has demonstrated that engaging in regular physical activity can have a beneficial effect on mental health and well-being, including enhancing personal resilience. Nonetheless, when nullifying the influence of other factors such as enjoyment and physical fitness, the relationship between physical activity and personal resilience is proven to not be statistically significant.

The findings reveal a statistically significant correlation of 0.260 ( $p < .001$ ) between physical fitness level and personal resilience. This leads to the conclusion that the relationship between physical fitness level and personal resilience is significant when controlling for the influence of physical activity enjoyment and level of physical activity through statistical analysis.

As the connections between physical activity and personal resilience, as well as physical activity enjoyment and physical fitness, were found to be not statistically significant, they were excluded from the model. The refined model of the variable relationships investigated in this study can be found in the Figure (See Figure 2).



**Fig 1:** The Refined Theoretical Model of the Physical of Sources Personal Resilience

Physical activity, physical activity enjoyment and physical fitness has a significant but moderate contribution to personal resilience. The R-square value of 0.260 means that approximately 26% of the variation in personal resilience can be explained by the physical factors of resilience included in the analysis. This indicates that physical activity enjoyment, physical activity routine, and physical fitness contribute to personal resilience, but there are also other factors that influence resilience that are not captured in our theoretical model.

**3.2 Discussion**

The findings align with previous studies, indicating a positive relationship between physical activity enjoyment, level of physical activity, physical fitness, and personal resilience [22]. Pleasure derived from physical activity can lead to its repetition, contributing to improved physical fitness and mental health outcomes. However, the direct impact of physical activity enjoyment on physical fitness is mediated by physical activity and personal resilience.

A significant relationship between physical activity enjoyment and personal resilience is identified, suggesting a psychological connection between the two. Physical activity alone does not solely contribute to resilience, contrary to the previous research that showed that there was positive and significant relationship between psychological resilience and physical activity [19]. However, the contribution of physical culture (physical activity, enjoyment, and fitness) to resilience is significant, even with a low R<sup>2</sup> value of 0.260. Individuals who participate in sports and experience both success and failure are familiar with adversity and have the ability to rise from defeat and continue to grow. This suggests that physical activity and enjoyment can serve as unrecognized and unintended exercises for resilience training.

Physical culture variables account for 26% of personal resilience, with the remaining 74% influenced by unexplored factors like family cohesion, social resources, social competence, and goal-oriented competence. It's important to acknowledge that personal resilience may not

be the primary focus of physical activity, making any resilience improvements an additional benefit.

Physical activity's impact on joy makes it a recommended strategy for enhancing physical fitness and personal resilience in Indonesian young people. While most variables in the study showed positive and significant relationships, the influence of other variables renders physical activity enjoyment and physical activity's direct relationship with personal resilience insignificant. This suggests the need to question the contribution of physical activity to resilience.

The study's results align with theories like hedonism by Bentham, perceptual theory, behavioral theory, and Thorndike's law of effect, which propose that humans engage in enjoyable and rewarding activities. The significant link between physical activity enjoyment and personal resilience emphasizes the importance of incorporating enjoyable physical activities in interventions targeting female teenagers.

Although this study did not find a significant direct relationship between physical activity and personal resilience, theoretical implications suggest an indirect link. Enjoyable physical activity may indirectly contribute to resilience by promoting repeated engagement, as supported by perceptual and behavioral reinforcement theory. The law of effect also suggests that behaviors associated with positive outcomes, such as enjoyment, are likely to be repeated, potentially leading to resilience benefits.

The study's implications highlight the importance of providing opportunities for adolescent girls to engage in enjoyable physical activities to foster resilience. However, physical activity alone may not suffice, necessitating the consideration of other factors like social support and family cohesion. Comprehensive interventions should encompass various aspects of their lives and address multiple factors that contribute to resilience.

**4. Conclusions**

The findings of this research suggest that physical fitness and physical activity enjoyment are associated with higher levels of resilience, and that physical activity may have an

indirect effect on resilience. Therefore, interventions aimed at promoting physical activity, particularly those that focus on enhancing enjoyment, may be beneficial for improving resilience, particularly among young teenagers.

In conclusion, the study demonstrates that physical activity, enjoyment, and fitness account for 26% of personal resilience among female teenagers. Thus, efforts empowering or strengthening female teenager's personal resilience should take advantages from and prioritize their physical activity and fitness while considering enjoyable activities and other influencing factors. A comprehensive approach is recommended for interventions aimed at enhancing female teenager's personal resilience.

Further research is needed to confirm and expand upon these findings. It would be valuable to study this relationship in different populations and using different research methods to gain a more comprehensive understanding of the complex relationship between physical activity, physical activity enjoyment, physical fitness and resilience. Additional research on the relationship between physical activity and resilience in other demographics such as the adult populations, as well as males would be useful.

### 5. Conflict of Interest

Not available

### 6. Financial Support

Not available

### 7. References

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