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Study of Differences in Physical Fitness Levels Between Male and Female Students in Class X of SMAN Madani Palu Integrated Model

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ABSTRACT

This study aims to determine the level of physical fitness of male and female students in class X-A of Madani Palu Integrated Model State Senior High School, as well as to analyze the differences between the two. The method used was a quantitative descriptive survey with data collection techniques through the Indonesian Physical Fitness test (TKJI), which includes 60 60-meter run, a 1200-meter run (boys) and 1000 meters (girls), vertical jump, sit up, and hanging body lift. The population in this study amounted to 91 students, consisting of 38 male students and 53 female students, and the entire population was sampled (total sampling). The results showed that the majority of students were in the moderate physical fitness category, with details: 63.3% of male students and 88.3% of female students fell into this category. This finding indicates that there is no significant difference between male and female students in terms of physical fitness level. Factors that influence this result include the limited frequency of PE lessons, lack of physical activity outside of school, and inadequate infrastructure. A sustainable exercise program and good environmental support are needed to improve students' physical fitness.

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INTRODUCTION

Physical fitness is a key indicator of overall health and well-being, particularly during adolescence. As students progress through secondary school, maintaining an optimal level of physical fitness is essential not only for their physical development but also for academic performance, mental health, and lifelong health behaviours (Cadenas-Sanchez et al., 2019). The World Health Organization (WHO) emphasizes the need for at least 60 minutes of moderate to vigorous physical activity daily for adolescents, citing its crucial role in developing musculoskeletal health, cardiovascular endurance, metabolic function, and mental resilience (WHO, 2020).

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In educational contexts, physical fitness is a core component of physical education (PE) curricula, and it serves as a benchmark for evaluating students' health and athletic potential. Among the key components typically measured are cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition (Ortega et al., 2015). These components are influenced by several factors, including genetics, environmental exposure, socioeconomic status, and sex.

Sex-based differences in physical fitness are well-documented, especially during adolescence when hormonal changes during puberty lead to divergent patterns in physical development between males and females. Boys tend to gain more lean muscle mass, testosterone levels increase, and they often demonstrate greater muscular strength, speed, and aerobic capacity (Faigenbaum et al., 2015). Girls, on the other hand, tend to accumulate more body fat and may exhibit higher flexibility but often score lower on tests of muscular endurance and aerobic capacity (Hardy et al., 2018).

These physiological differences begin to emerge around the age of 13 and become more pronounced by age 15 to 16, the typical age of Class X students in Indonesia. Research shows that even when activity levels are comparable, males often outperform females in standardized physical fitness tests such as the 20-meter shuttle run, sit-ups, push-ups, and vertical jumps (Silva et al., 2020; Cvenkel et al., 2019). Nonetheless, such generalizations should be interpreted with caution, as environmental and behavioral factors such as motivation, nutrition, training exposure, and cultural influences also play significant roles in determining fitness levels.

In the Indonesian context, physical fitness assessments are a regular feature of PE programming in high schools. However, the understanding and interpretation of gender differences in fitness outcomes remain underdeveloped, especially in public schools that follow integrated or specialized educational models.

SMAN Madani Palu Integrated Model is a senior high school that adopts a holistic approach to education, combining academic excellence with religious, character, and physical development. As part of its curriculum, Class X students regularly participate in physical education sessions that include fitness testing and performance evaluation. However, anecdotal observations by PE teachers indicate notable differences in physical fitness test results between male and female students, particularly in endurance and strength-based assessments.

This raises questions regarding whether these observed differences are consistent with global trends or are shaped by local contextual factors. While it is widely accepted that biological sex influences physical fitness outcomes, the magnitude of these differences and their implications for teaching and assessment in a localized school environment like SMAN Madani Palu have not been systematically studied.

Understanding such differences is crucial for tailoring PE instruction to ensure equity, maximize student potential, and foster a more inclusive and supportive learning environment for both boys and girls.

Although numerous international studies have addressed sex-based differences in physical fitness among adolescents, few have done so within the Indonesian educational

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framework. Even fewer studies have been conducted in integrated model schools such as SMAN Madani Palu, which blend academic, spiritual, and physical development. Moreover, the literature is often focused on urban or elite private schools, leaving a gap in understanding how physical fitness varies across genders in public schools, especially in regions outside Java and Bali.

Most national studies do not disaggregate fitness outcomes by sex or fail to explore the sociocultural dimensions that may influence physical activity participation and performance, such as gender norms, religious beliefs, or peer influences (Setyawan et al., 2021; Nopembri et al., 2020). Therefore, there is a need for gender-disaggregated, context-specific studies that assess fitness levels in Indonesian high schools.

This study contributes to the body of knowledge by providing a gender-based analysis of physical fitness levels in a public, integrated model school setting in Eastern Indonesia. It is among the first studies to assess and compare physical fitness profiles between male and female Class X students in SMAN Madani Palu, using standardized fitness test batteries.

By focusing on students aged 15 to 16—an age marked by substantial physical and psychological transitions—the study offers a snapshot of how sex-based differences manifest in this critical developmental window. Additionally, it evaluates the influence of school-based physical education programming on these differences and provides recommendations for improving PE curriculum delivery in gender-sensitive ways.

The findings can inform PE educators, school administrators, and policymakers about how to design equitable physical education practices that consider sex-based physiological differences without reinforcing gender stereotypes.

In light of the above, this study aims to examine the differences in physical fitness levels between male and female students in Class X of SMAN Madani Palu Integrated Model. The central research questions guiding this inquiry are: (1) Are there statistically significant differences in physical fitness levels between male and female Class X students at SMAN Madani Palu?, (2) Which physical fitness components (e.g., endurance, strength, flexibility) show the most pronounced differences?, and (3) What contextual factors may contribute to these differences?

The study adopts a quantitative, comparative design using standardized fitness tests such as the 20-meter shuttle run, sit-ups, push-ups, and sit-and-reach. Data analysis will include mean comparisons, standard deviations, and t-tests to determine the significance of observed differences. The results are expected to provide empirical insights that support more differentiated and equitable physical education programming in Indonesian high schools.

METHODS

The type of this research is descriptive research with a quantitative approach. According to Kusumawati (2015: 19) explains that this method is called a quantitative method because the research data is in the form of numbers and analysis using

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statistics. Population is an object or subject that is in an area that meets certain requirements related to research problems (Riduwan, 2005: 54). The population in this study were male students of class X-A of SMAN Model Integrated Madani Palu, consisting of 35 male and female students of class X-A of SMAN Model Integrated Madani Palu. Samples are part of the population that have certain characteristics or conditions that will be studied (Riduwan, 2005: 11). The technique used is total sampling, namely, the entire population is sampled. Thus, the sample in this study amounted to 91 male students of class X of Madani Palu Integrated Model Senior High School.

The measurement technique is used to obtain data used for research, namely by conducting the Indonesian physical fitness test (Widiastuti, 2017: 45). With a series of tests consisting of: 1. Physical Fitness Test for 16-19 Year Old Boys.

Following the type of data required in this study, the type of measurement is the Indonesian physical fitness test (Widiastuti, 2017: 45). The Indonesian physical fitness test for sons of test items consists of: 1) 60-meter sprint age 16 - 19 years old, 2) Body hanging lift, 3) Baring sitting 60 seconds, 4) Upright jump,5) Long run 1200 meters age 16 - 19 years old.

Table 1.
60 Meter Run Assessment Norms

13 – 15 Years			16 – 19 Year	
SON	**DAUGHTER**	**GRADES**	**SON**	**DAUGHTER**
SD - 6.7"	SD – 7.7"	5	SD – 7.2"	SD – 8.4"
6.8" – 7.6"	7.8" – 8.7"	4	7.3" – 8.3"	8.5" – 9.8"
7.7 " – 8.8 "	8.8" – 9.9"	3	8.4" – 9.6"	9.9" – 11.4"
8.8" – 10.3"	10.0" – 11.9"	2	9.7" – 11.0"	11.5" – 13.4"
10.4" - dst	12.0" - dst	1	11.1" - dst	13.5" - dst

(Nurhasana and Cholil, 2014:106)

Table 2.
Body Lift Assessment Norms

13 – 15 Years			16 – 19 Year	
SON	**DAUGHTER**	**GRADES**	**SON**	**DAUGHTER**
16 ke atas	41 ke atas	5	19 ke atas	41 ke atas
11 – 15	22 – 40	4	14 – 18	22 – 40
6 – 10	10 – 21	3	9 – 13	10 – 21
2 – 5	3 – 9	2	5 – 8	3 - 9
0 – 1	0 - 2	1	0 – 4	0 – 2

(Nurhasana and Cholil, 2014:106)

Table 3.
Norms for 60-second Sitting Barring Assessment

13 – 15 Years			16 – 19 Year	
SON	**DAUGHTER**	**GRADES**	**SON**	**DAUGHTER**
38 ke atas	28 ke atas	5	41 ke atas	29 ke atas
28 – 37	19 – 27	4	30 – 40	20 – 28
19 – 27	9 – 18	3	21 – 29	10 – 19
8 – 18	3 – 8	2	10 – 20	3 – 9
0 – 7	0 - 2	1	0 – 9	0 – 2

(Nurhasana and Cholil, 2014:112)

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Table 4.
Upright Jump Assessment Norms

13 – 15 Years			16 – 19 Year	
SON	**DAUGHTER**	**GRADES**	**SON**	**DAUGHTER**
66 ke atas	50 ke atas	5	73 ke atas	50 ke atas
53 – 65	39 – 49	4	60 – 72	39 – 49
42 – 52	30 – 38	3	50 – 59	31 – 38
31 – 41	21 – 29	2	39 – 49	23 – 30
0 – 30	0 – 20	1	0 – 39	0 – 20

(Nurhasana and Cholil, 2014:115)

Table 5.
1000 and 800 Meter Run Assessment Norms

13 – 15 Years			16 – 19 Year	
SON	**DAUGHTER**	**GRADES**	**SON**	**DAUGHTER**
SD – 3.04″	SD – 3.05″	5	Sd – 3.14″	SD – 3.52″
3.05″ – 3.53″	3.07″ – 3.55″	4	3.15″ – 4.25″	3.53″ – 4.56″
3.54″ – 4.46″	3.56″ – 4.58″	3	4.26″ – 5.12″	4.57″ – 5.58″
4.47″ – 6.04″	4.59″ – 6.40″	2	5.13″ – 6.33″	5.59″ – 7.23″
6.05″ – ke atas	6.41″ ke atas	1	06.34 – ke atas	7.24″ – ke atas

(Nurhasana and Cholil, 2014:120)

RESULTS AND DISCUSSION

Based on data from the research results of Physical Fitness Between Male and Female Students on May 22, 2025, obtained through surveys with test and measurement techniques. From the data collected, data analysis is then carried out with statistical calculations. The following is a description of each test carried out. The purpose of describing at the time of this study was to determine the level of physical fitness between male and female students at Madani Integrated Model High School. Data taken based on physical condition components and basic techniques: physical fitness tests (60 Meter Run), (Hang the body lift), (Baring sitting 60 seconds), (Jumping upright) and (1000 Meter Run) can be seen in the following results:

Table 6.
60 Meter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	3	5,0	5,0	5,0
	Poor	12	20,0	20,0	25,0
	Average	30	50,0	50,0	75,0
	Good	14	23,3	23,3	98,3
	Very good	1	1,7	1,7	100,0
Total		**60**	**100,0**	**100,0**	

From the results of the 60-meter running test, it is known that there are 3 male students who get very poor scores, 12 students with poor scores, 30 students with moderate scores, 12 students with good scores and the remaining 1 student gets a very good score.

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Table 7.
Body Lift

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	25	41,7	41,7	41,7
	Poor	19	31,7	31,7	73,3
	Average	16	26,7	26,7	100,0
Total		**60**	**100,0**	**100,0**	

From the elbow hanging test table, it is known that there are 25 male students who get very poor scores, 19 students with poor scores and the remaining 16 students with moderate scores.

Table 8.
Sit up

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	5	8,3	8,3	8,3
	Average	22	36,7	36,7	45,0
	Good	29	48,3	48,3	93,3
	Very good	4	6,7	6,7	100,0
Total		**60**	**100,0**	**100,0**	

Based on the results of the sit-up test item, it is known that there are 5 male students who get poor scores, 22 students with moderate scores, 29 students with good scores and the remaining 4 students get excellent scores.

Table 9.
Vertikal Jump

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average	1	1,7	1,7	1,7
	Good	5	8,3	8,3	10,0
	Very good	54	90,0	90,0	100,0
Total		**60**	**100,0**	**100,0**	

From the results of the vertical jump test, it is known that there is 1 male student with a medium score, 5 students with good scores and the remaining 54 students get excellent scores.

Based on the results of the physical fitness test, it can be seen that the results of the physical fitness test of female students of Madani Integrated Model Senior High School as a whole, there 7 students who get lower scores, and the remaining 53 students get moderate scores. From the above results, it can be seen that there are no female students who have good, very good or very poor physical fitness.

Table 10.
60 Meter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	8	13,3	13,3	13,3
	Poor	42	70,0	70,0	83,3
	Average	10	16,7	16,7	100,0
Total		**60**	**100,0**	**100,0**	

For the 60-meter running test for female students, it is known that 8 female students get very poor scores, 42 students with poor scores and the remaining 10 students with moderate scores.

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Table 11.
Body Lift

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	14	23,3	23,3	23,3
	Average	44	73,3	73,3	96,7
	Good	2	3,3	3,3	100,0
Total		**60**	**100,0**	**100,0**	

The elbow hanging test found that there were 14 female students with poor scores, 44 students with moderate scores and 2 students with good scores.

Table 12.
Sit up

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	7	11,7	11,7	11,7
	Average	33	55,0	55,0	66,7
	Good	20	33,3	33,3	100,0
Total		**60**	**100,0**	**100,0**	

For the sit-up test on female students, it is known that there are 7 female students with poor scores, 33 students with moderate scores and the remaining 20 students with good scores.

Table 13.
Vertikal Jump

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Good	9	15,0	15,0	15,0
	Very good	51	85,0	85,0	100,0
Total		**60**	**100,0**	**100,0**	

From the results of the vertical jump test, it is known that there are 9 female students who get good scores, and the remaining 51 students get excellent scores.

CONCLUSION

Based on the results of the study, several conclusions can be drawn, namely:

1. The level of physical fitness of Madani Integrated Model State students in the 2024/20025 academic year is on average in the moderate category, from the results of statistical calculations stated at 75.8% with a sample size of 91 students in the moderate category.
2. The level of physical fitness of male students of Madani Integrated Model State in the 2024/2025 academic year is on average in the moderate category, from the results of statistical calculations stated at 63.3% with a sample size of 38 male students in the moderate category.
3. The level of physical fitness of female students of Madani Integrated Model State Senior High School in the 2024/2025 academic year is on average in the moderate category, from the results of statistical calculations stated at 88.3% with a sample size of 53 female students in the moderate category.

Based on the above conclusions, the suggestions that researchers can give include:

1. To improve the ability in the field of 60 m running, students should be able to do exercises with short movements or in a short time, for example, short running exercises with loading.
2. To improve abilities in the field of running 1200 m and 1000 m, students should do breathing exercises. The heart, circulatory and respiratory systems are the main means of measuring all the elements needed by the body, especially oxygen, which functions for combustion in the process of processing food substances in the body so as to produce the necessary energy.
3. To improve vertical jump ability, students should do agility training. With this exercise, students are expected to be able to make changes in movement quickly and precisely while the body moves from one place to another.
4. To improve the ability of sit-ups, students should practice muscle strength and speed of muscle contraction. It is intended that all factors affecting these two things will affect muscle power so as to increase the ability of students to do physical work suddenly.
5. To improve the ability to hang elbows, students should do balance and endurance training. With this exercise, students will have the ability to maintain a posture that, at the time of movement, depends on the ability of integration between the work of the sense of vision, the semicircular canals of the ears and receptors in the muscles.

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