

Original Article

Validity and Reliability of Physical Fitness Test of Nusantara Students at SMP Padang City

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ABSTRACT

The validity and reliability of the Nusantara Student Fitness Test instrument remain uncertain, prompting this study to investigate its efficacy. This research aims to assess the validity of various components of the test, including Body Mass Index (BMI), V Sit and Reach, 60-second Sit Up, Squat Thrust, Pacer Test, and overall reliability of the Nusantara Student Fitness Test (TKPN) instrument. A descriptive research method was employed, involving 109 junior high school students from Padang City across 11 districts. The sample comprised 143 students actively participating in extracurricular sports from SMP N 18 Padang City and SMP Adabiah Padang City. Data analysis utilized correlation tests (rxy) at a significance level of 0.05. The findings reveal several key outcomes: (1) BMI provided insights into students' nutritional status, with the majority exhibiting good nutrition; (2) The V Sit and Reach test exhibited validity (0.314 > 0.163), albeit not particularly useful; (3) The Sit Up test demonstrated acceptable validity (0.647 > 0.163); (4) The Squat Thrust test showed clear relevance (0.444 > 0.163); (5) The Pacer Test displayed very good validity (0.814 > 0.163); (6) The TKPN instrument exhibited medium reliability (0.676). These findings contribute to a better understanding of the Nusantara Student Fitness Test instrument's effectiveness and underscore the importance of validity and reliability assessments in fitness evaluation tools.

Keywords: Validity, Reliability, Physical Fitness.

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INTRODUCTION

Sport is a physical activity that is beneficial in life and running life ^{1,2}. Sports are one of the fields that play an important role in human life through coaching and development through sports events carried out. By exercising, in addition to seeking body freshness, exercise is one way to get appreciation to improve the dignity and dignity of the nation. Now people have understood and understood the needs of sports to run their lives, this can be seen through the development of sports that occur ^{3,4}. People have full awareness of keeping their bodies healthy and fit, because

physical fitness is an important aspect of human life, with a fit body can make it easier to carry out daily activities ^{5,6}.

Physical fitness is an important aspect of human life, with a fit body can make it easier to carry out daily activities ^{7,8}. Physical fitness is also related to Health ^{9,10}. Physical fitness is one of the most influential elements in human life, with good physical fitness, it is also good in carrying out activities as a human being, both related to physical problems and related to spiritual problems ¹¹. This is in line with opinion ⁵ which states that fitness is also in line with a healthy lifestyle. In addition, physical fitness is a person's physical ability to carry out

daily tasks without feeling excessive fatigue and recover before the same task comes the next day¹². Physical fitness does not merely appear without any effort made, in addition to food that must be maintained, motivation to stay healthy of course also by doing exercises that are in accordance with the purpose^{13,14}.

The activity in question is also not spared for every student, especially in Indonesia, because to achieve it has been assisted in compulsory subjects, namely physical education for the Elementary School (SD), Junior High School (SMP), and High School (SMA) levels. This is a form of government support to achieve physical fitness of students in Indonesia because physical freshness and learning achievement are inseparable^{15,16}. Because basically physical education is the need of every individual to run his life¹⁷. Physical fitness is a very important aspect of overall body fitness that gives students the ability to persevere following the training process that takes place both in practice and outside of practice so as not to get tired quickly to lead a productive life and be able to adjust to the right physical load¹⁸. Through physical education, it is expected to be able to maintain body fitness so that it can improve cognitive^{19,20}. When cognitive increases, it also facilitates decision making²¹. When everything goes well, you are able to achieve one of the goals of the sport, namely achievement. Of course, this also leads to Presidential Regulation (Perpres) No. 86 of 2021 concerning the Grand Design of National Sports (DBON), the other of which aims to increase the capacity, synergy, and productivity of national achievement sports. In its latest direction, it directs to a new type of test instrument in looking at the physical fitness of students in the archipelago.

Every human being in carrying out daily activities requires good physical conditions, as is the case with students with their task of learning²². The physical fitness test instrument is one of the tests used to determine a person's physical fitness level. Many previous test instruments can be used as physical fitness test instruments, such as the Indonesian Physical Fitness Test (TKJI) but over time new instruments have emerged to measure physical fitness. According to^{23,24} The emergence of this instrument as a form of the development of science to increase activities that support

learning. The test in question is the Nusantara Student Fitness Test (TKPN) which consists of 5 test instruments, namely BMI (Body Mass Index), V Sit and Reach, Sit Up 60 seconds, Squat Trust 30 seconds, Pacer Test.

However, currently it is not known about the validity and reliability of the test instrument for the junior high school level in Padang City. Validity is a concept used in research to measure the extent to which a measurement instrument or research method can be considered as an accurate measuring instrument to measure or collect data in accordance with the purpose of the study. Knowing the validity of the test instrument can facilitate the evaluation of physical ability in sports because it is also one of the important components in determining and improving sports achievement in all sports²⁵. Therefore, researchers will examine the level of validity and reliability of the Indonesian Student Fitness Test (TKPN) at SMP Kota Padang.

METHOD

This study used the product moment correlation method. Researchers want to know how valid and reliable the Indonesian Student Fitness Test (TKPN) instrument in Padang City is. The population in this study was junior high school students in Padang City. The sampling technique uses purposive sampling based on the criteria of students who take part in extracurricular sports activities at school, namely at SMPN 18 Kota Padang and SMP Adabiah Kota Padang, so that the number of samples in the study was 143 samples.

This study aims to determine the validity and reliability of the Indonesian Student Fitness Test (TKPN) instrument. Data collection of instrument validity was carried out by conducting tests on 143 samples. The following are the test instruments tested;

- a. Body Mass Index (BMI)
Body Mass Index (BMI) is a form of measurement with a screening method used for anthropometric measurements of a person's body. Nowadays most people focus more on the taste of the dish than the nutritional intake in the food itself, so that the weight they have is not appropriate, with the aim of knowing the vertical posture from floor to head (vertex)

- b. *V Sit and Reach*
The sit and reach (SR) test is a field test used to measure hamstring and lower back flexibility. This test aims to measure a person's effectiveness in adjusting to all activities by stretching the body on a wide joint plane.
- c. *Sit Up 60 seconds*
Sit ups are one of the physical activities-resistance exercises whose movements train the abdominal muscles to lift the weight of the body until it forms a 90° angle from a lying position.
- d. *Squat Thrust 30 seconds*
Squat thrust is a combination movement of changing the position of the body from a standing position, squatting then a push-up position and returning to standing. This test aims to measure the endurance ability of strength, body control, balance, coordination and agility.
- e. *Pacer Test*
The test run is 20 meters marked with markings with an initial speed of 8.5 km / h and will be increased by 0.5 km / h every minute marked with a signal. The Progressive Aerobic Cardiovascular Endurance Run (PACER) test is a progressive aerobic cardiovascular endurance test using a back-and-forth run at a distance of 20 meters with a stride speed increasing every minute following a predetermined rhythm. This test aims to measure the working ability of the heart and lungs to the maximum.

After the instrument validity data is collected, the next step is to collect instrument reliability data by means of the halving technique. To analyze the data that has been obtained, a simple correlation test will be carried out. If the correlation value is high, then the result will determine the validity of the created instrument. After that, researchers will analyze the level of reliability of the instrument by looking at the correlation between test results in odd and even groups. The statistical analysis used to find out how high the reliability level of this instrument is is correlation using the halving technique (Spearman Brown).

RESULTS

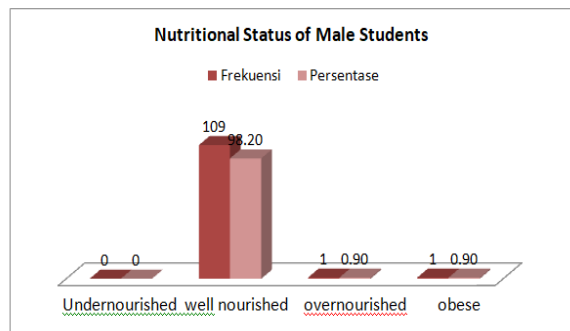


Figure 1. Nutritional Status of Male Students

Body Mass Index data is used to see the nutritional status of students, which is divided into two, namely based on gender, namely 111 men and 32 women. For men, 109 people with good nutrition category (98.20%), 1 person with more nutrition category (0.90%), and 1 person with obesity category (0.90%).

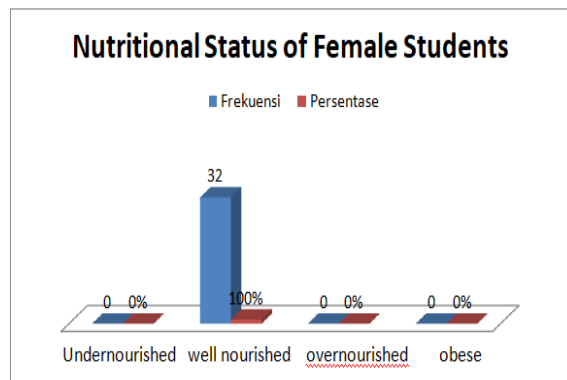


Figure 2. Nutritional Status of Female Students

While for women, 32 people with good nutrition category (100%) were obtained.

Table 1. Validity of V Sit and Reach Instruments

Test Name	R count	R table	Information
V Sit and Reach	0,341	0,163	Valid

V Sit and Reach instrument testing was carried out by correlating the results of student achievement in conducting this test three times, from the three experiments the highest data was taken. After that, an analysis was carried out to see the physical fitness of the students. After both of them were obtained, a correlation test

was carried out between the results of V Sit and Reach on physical fitness, and obtained r count results of $0.341 > 0.163$ (Valid / Acceptable).

Table 2. Validity of Sit Up Instruments

Test Name	R count	R table	Information
Sit Up 60 seconds	0,647	0,163	Valid

Sit Up instrument testing is carried out by correlating the results of student achievement in conducting this test. After obtaining the results, a correlation test was then carried out between the results of Sit Ups on physical fitness, and obtained the results of r count $0.647 > 0.163$ (Valid / Good).

Table 3. Squat Thrust Instrument Validity

Test Name	R count	R table	Information
Squat Thrust	0,444	0,163	Valid

The testing of the Squat Thrust instrument was carried out by correlating the results of student achievement in doing this test for 30 seconds. From the data obtained, a correlation test was carried out between the results of Squat Thrust on physical fitness, and obtained the results of r count $0.444 > 0.163$ (Valid / Clearly Related).

Table 4. Validitas Instrumen Pacer Test

Test Name	R count	R table	Information
Pacer Test	0,814	0,163	Valid

Testing the pacer test instrument is carried out by looking at the results of student achievements in conducting this test. Furthermore, a correlation test was carried out between the results of the pacer test on physical fitness, and obtained the results of r count $0.814 > 0.163$ (Valid / Clearly Related).

Table 5. Reliability of Nusantara Student Fitness Test Instrument (TKPN)

Test Name	R count	R table	Information
TKPN	0,510	0,686	Valid

After conducting the validity test, the next is to conduct a reliability test using the half split test or the halving technique (Spearman Brown). This halving technique is carried out by dividing the sample of 143 people into 2 odd and even groups consisting of 72 people for the first group and 71 people for the second group. Then further testing between odd and even groups was carried out to test its reliability.

After testing, a reliability result of 0.510 was carried out, then further testing was carried out, using the Spearman Brown reliability formula with a result of 0.686 and was in the medium category.

DISCUSSION

The validity and reliability test of the Nusantara Student Fitness Test (TKPN) instrument was carried out to determine whether or not the TKPN test instrument was valid consisting of 5 test instruments consisting of Body Mass Index (BMI), V Sit and Reach, Sit Up, Squat Thrust, and Pacer Test as well as to determine the reliability of the Nusantara Student Fitness Test (TKPN) test instrument. The results of this test are expected to be able to answer and become a reference in the use of this test instrument. Data collection of instrument validity and reliability was carried out by testing 143 samples. To analyze the data that has been obtained, a simple correlation test will be carried out. If the correlation value is high, then the result will determine the validity of the created instrument. After that, researchers will analyze the level of reliability of the instrument by analyzing statistically to find out how high the level of reliability of this instrument with correlation using a correlation test with a split half test (halving technique).

^{26,27}states, "The number that indicates whether or not a test is valid is called a validity coefficient whose magnitude ranges from 0 to +1. The coefficient of statistical validity can range from -1 to +1, the higher the validity of the test, the more precisely the test is used, conversely, the lower the coefficient of validity of the test, the more doubtful the accuracy of the test in measuring. ^{28,29}states By knowing the level of validity and reliability of the instrument, it can be used as a reference in choosing and using a valid fitness test for use.

Statistical testing was carried out on four test instruments, namely v sit and reach, sit up, squat thrust, and pacer test. Meanwhile, the Body Mass Index (BMI) test instrument is analyzed to see the level of nutritional status. The level of nutritional status of students is adjusted based on the Minister of Health Regulation Number 2 of 2020 concerning Anthropometric Standards for Children with male and female genders. The Minister of Health contains categories and thresholds for children's nutritional status. BMI is one of the

things needed to get data on the results of nutritional status, besides that height and weight data are also needed. From the testing carried out will get the results of how the nutritional status of a person.

The results of this nutritional status also refer to physical activity that cannot be separated from the influence of physical fitness, where in every activity carried out regularly and has a stable level of activity will also affect physical fitness^{30,31}. After obtaining nutritional status results based on BMI data, it was continued with testing the validity and reliability of four other test instruments at the crime scene. The results of data analysis showed that the four test instruments were in the valid category. However, with different values and levels, such as in the V Sit and Reach test instrument, measurements are valid but still in the category of useless.

Then on the 60-second sit up test instrument, the measurement is valid and is in the acceptable category. Furthermore, the squat thrust instrument is valid and is in a clearly related category. And finally, the pacer test instrument in measurement is already in the valid category with a very good category and this instrument is the instrument with the highest value of the measurement scale³². So simply based on the four test instruments, all of them are already in the valid category but with different categories and one of them with the useless category. Furthermore, after conducting a validity test, a reliability test was carried out which based on the test stated that the Nusantara Student Fitness Test (TKPN) instrument was reliable with a medium category.

This study discusses the validity and reliability of fitness test instruments used in junior high school students in Padang City. The results showed that the use of Body Mass Index (BMI) as a tool to assess students' nutritional status was reliable, with most students in the good nutrition category. However, the V Sit and Reach test instruments have low validity and are considered useless, while the Sit Up, Squat Thrust, and Pacer Test tests show higher validity, with acceptable to excellent categories. That is, the test can reliably measure certain components of fitness in students^{33,34}.

In the context of test instrument validity, these findings may provide valuable guidance for the assessment of junior high school students' fitness. Especially, Sit Up, Squat Thrust, and Pacer Test test instruments

can be good choices to get an accurate picture of a student's fitness level. In addition, the study also highlights the importance of understanding the limitations of certain instruments, such as V Sit and Reach, which may not provide valid information regarding student fitness. Therefore, the selection of appropriate test instruments is a crucial aspect in accurately assessing student fitness^{35,36}.

The reliability results of the Nusantara Student Fitness test (TKPN) showed a moderate level of reliability. Nevertheless, its fairly good reliability still makes this instrument reliable for consistent measurement of student fitness. This provides a strong foundation for the use of the crime scene test as a tool for evaluating the physical fitness of junior high school students. Thus, this study not only provides insight into the validity of the test instruments, but also strengthens confidence in the reliability of the instruments used in measuring student fitness at the junior high school level in Kota Padang.

CONCLUSION

Overall, this study contributes significantly to the understanding of the validity and reliability of fitness test instruments commonly used in junior high school students in Padang City. First, the results show that Body Mass Index (BMI) can be relied upon as a tool to assess students' nutritional status, providing an in-depth understanding of their health condition. Meanwhile, the finding of low validity on the V Sit and Reach test instrument provides a warning of the need to consider more valid alternatives in measuring student flexibility. This limitation should be a concern in the preparation of school fitness programs to ensure that the data collected provides an accurate and relevant picture of the physical condition of students.

The results corroborate the reliability of the Sit Up, Squat Thrust, and Pacer Test test instruments as valid tools for evaluating the fitness of junior high school students. The validity found in these instruments opens up opportunities for wider application in the context of school physical fitness assessments. Although the reliability of the Nusantara Student Fitness test (TKPN) is categorized as moderate, it still creates a solid basis for its use in measuring student fitness consistency. This conclusion provides a strong foundation for educators and researchers to select and develop

appropriate test instruments, while improving the quality of physical fitness assessments of students at the junior high level.

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CONFLICTS OF INTEREST

All authors declared no conflict of interest in this study.

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