AMERICAN JOURNAL OF SOCIAL AND HUMANITARIAN RESEARCH

ISSN: 2690-9626
Vol. 5, No.2, February 2024

The Effectiveness of Physical Measurements in Distinguishing the Gradual Slope of High-Level and Low-Fitness Students

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Abstract: Determining the physical measurements affecting the physical fitness of high- and low-level students using the gradient regression method. The two researchers used the descriptive approach in the survey method for its relevance and the nature of the research, and the research community consisted of female students from College and Departments of the Physical Education and Sports Sciences at Mosul and Hamdania university, and the research sample consisted of (153) female students distributed over the four stages. The two researchers used the following tests (the 20-meter sprint test from the high start, the test of sitting from lying down from the knees bent position during (10 seconds), the test of the wide skip of stability, the test of three hops for the right leg then the left for the farthest distance, and the test of throwing the medical ball weighing (3 kg) from the position Sitting on a chair in front of the chest, and a running-walking test of 400 meters. As for the physical measurements used (height - weight - length of the torso from sitting - arm length - leg length - chest width - hip width - thigh width - ulna width - shoulder width – perimeter humerus - Chest perimeter - waist perimeter - hip perimeter – calf perimeter - thickness of skin tuck behind humerus - thickness of the skin tuck under the shoulder - thickness of the skin tuck of the calf), and statistical means were used through the statistical bag spss, The conclusions are: Through differentiation analysis, it was possible to extract the physical measurements (height - weight - hip width - thigh width - humerus width - humerus perimeter - chest perimeter - waist perimeter - hip primeter- thickness of the skin tuck of the back of the humerus - thickness of the skin tuck of the calf). Through the Wilkes-Lambada test, it was possible to construct the estimated function = 14,699 + (thickness of the skin tuck of calf -0.107) + (length 0.073) + (weight -0.167) + (chest width 0.124).

Keywords: physical measurements, slope, fitness.

INTRODUCTION:

There are many factors that affect fitness, and what is important in this research is physical construction measurements Such measurements can play a relative role in distinguishing female

students, the problem of research arises in asking what physical variables can distinguish, High-level and low-fitness students, and are they able to discriminate?

Fitness is linked to the work he must perform and his ability to exert physical effort. Every sport has its general physical requirements that helps to improve his skills. And the fitness of each player varies from player to another in consider of his preparation and physical construction[13]. A frusting characteristic of fitness is that the results cannot be seen immediately as they must spend months and years to achieve to the ultimate results[14]. So, one of the concerning problems in the society nowadays is that they have apoor tracking ability [2]. Some of them also find it extremely hard to be motivated and keep exercising constantly due to the fact that exercising is totally voluntary based[14] yet sport managers frequently struggle to adopt new technologies [4].

Discriminatory analysis is one of the statistical methods that classifies independent and influential variables into a subordinate variable, In the field of sports education, there are many examples Such as physical measurements (an independent variable) can affect physical fitness (a subordinate variable). Discriminant analysis is based upon two main assumptions. The first is that the distributions of all independent variables are normal (Gaussian), which encourages the use of continu- ous rather than discrete data in the predictive model, the second assumption applies only for linear discriminant analysis, in which the covariance matrices for the different groups of observations are assumed to be equal (homoscedasticity) [11]. The second assumption is very restrictive and in practice rarely applies in full[5]. As McLachlan (1992) points out on p. 132, ‘‘...in practice, it is perhaps unlikely that homoscedasticity will hold exactly’’. The reliability of a given test is an important consideration for the test’s usefulness to practitioners. Reliability refers to the notion of consistency, wherein repeated measurements of a phenomenon under similar conditions using a reliable test will yield results that are nearly identical to one another[12].

STATISTICAL METHODLOGY:

research approach: The researchers used the descriptive methodology in the survey method to fit it and the nature of the study, Research Community and Its Appointment: The research community included female students in physical education for Mosul and Hamdania universities and their departments The total number of students (440) is divided into the four grades A sample of 153 students was selected in the multiple cluster method, and table (2) shows this.

TABLE1: research community

college	phase				Grand total
	first	second	third	fourth	
Physical education	25	52	60	40	154
Girl’s education	17	50	47	40	177
basic	13	5	17	14	64
hamdania	12	14	24	14	46
Total research community =440					

TABLE 2:sample for the survey

college	phase				Grand total	percentage
	first	second	third	fourth		
Physical education	9	18	20	13	60	39٪
Girl’s education	7	20	18	15	60	33٪
basic	2	2	4	4	12	33٪
hamdania	4	5	7	5	21	26٪
Total study sample =153						32,75٪

methods of data collection Fitness variables and tests: In order to identify the fitness variables used in the research, the researchers used a number of sources, references and previous studies To identify the most important elements of fitness , the researchers then designed the questionnaire form They were presented to a group of specialists for fitness items and fitness elements were selected by experts It is (the transition speed - the distinctive speed strength of the abdominal muscles - the distinctive speed strength of legs muscles - Explosive strength of arms muscles - periodic-respiratory system table) .

The researchers then prepared a questionnaire containing tests of all the physical traits used in the research and were presented to the specialists (20m sprint test from high start [6.7.8.14,] Sitting Test of Lumps from Knee Bending Position 10 Seconds [10.1.18], Test three shapes for as long as possible and for each man alone [3], 3kg medical ball throwing test of sitting position on chair of stability for farthest distance [9.15.16.17], Broad jump of stability [19], 400m Walking Jogging Test [9].

The scores for the above tests have been converted to the normative level in order to standardize to obtain the normative physical fitness total, and then find the upper group and the lower group.

This was done by finding the arithmetic medium of the normative aggregate and then considering the higher grade of the arithmetic medium to be the higher group. The lower degree of the arithmetic medium is the lower group. Identification of the physical measurements used in the research: The researchers presented the Survey form for physical construction components to a group of specialists to identify the most important physical components of students suited to the subject matter, The percentage of the agreement (75%) and more than the opinions of the specialists, which included on (Length - Weight - hip width - thigh width - humerus width - humerus perimeter - chest perimeter - waist perimeter hip perimeter thickness of skin tuck behind the humerus – thickness of skin tuck for leg calf) .

Final applications of tests and measurements of physical construction:

TABLE 3: Measurements and tests were carried out on female students after experts identified the tests conducted over three days as follows: -

First-day	Measurements of physical construction
Second-day	Transitional Speed test
	Explosive strength of arms muscles
	The distinctive strength of speed for the legs muscles
Third- day	Explosive strength of the legs muscles
	The distinctive strength of legs muscles
	Table of periodic-respiratory device

The physical measurements were taken between (9_11) hours in the morning and the researchers emphasized the need to empty the water content by female students as well as abstinence from morning breakfast.

Tools used in research: Computer/ Thickness Measuring Device / Chair / Whistle (2) medical ball weight (3kg)/ Smart Honor Balance/ Blefometer for measuring rope symptoms ⁄ tape measuring from (150) cm (1)/ Device Body Composition Analyzer ⁄ Timing clock (2) / Tape measuring (50) 1m / Medical Balance (1)

Statistical Means: The data were processed statistically using the following statistical means arithmetic medium - normative deviation - Using the statistical program spss differentiation analysis in the stepwise way.

PRESENTATION AND DISCUSSION OF RESULTS:

TABLE4: The morale of independent variables in the discriminatory model in a step-by-step manner

variable	wilks' lambda	F	Df1	Df2	sig
Thickness of ulna	0.86	24.605	1	151	0.000
height	0.833	15.086	2	150	0.000
weight	0.788	13.333	3	149	0.000
Chest width	0.768	11.191	4	148	0.000

Through Table (4) which represents the morale test of the Lambada Test for independent variables entered as variables in the discriminatory template, note in the first step such as (thickness of ulna) Followed by variable entry (length), (weight), (chest width) We note the decrease in Lambada's values (0.86, 0.833, 0.788, 0.768) respectively We note the decrease in Lambada's values (0.86, 0.833, 0.788, 0.768) respectively, This indicates its effectiveness in discrimination as well as the morale of my value (F) The probability values were less than 0.05. This indicates that these four variables have a moral effect on the distinctive function.

TABLE5: Lambada's Overall function template

function	wilks' lambda	Chi-square	df	sig
values	0.768	39.374	4	0.000

Through Table (5), which represents a test and centerpiece of the total template, note that value (0.768), The probability value of the test (Ka Square) is (0.000), which is a moral value because it's smaller than (0.05), Thus, the distinctive function has the potential to distinguish between the two groups.

TABLE6: The latent root and legal correlation of the distinctive function

function	Latent root	Variance ratio	Cumulative variance	legal correlation
values	0.302	100	100	0.482

Through table (6) which represents the value of the latent root and the legal correlation of the function, The value of the latent root is (0.302), which refers to the ratio of discrepancy between the two groups of high and low-level students, the legal correlation was (0.482) , and squaring it can give us how much physical structure measurements contribute to the discriminative function , which is (23%).

TABLE7: Normative and non-normative transactions of a distinctive function

variable	Standard transaction	Non- normative transaction
Thickness of ulna	- 0.571	- 0.107
height	0.708	0.073
weight	- 0.385	- 0.167
	0.571	0.124
Non-normative fixed	699.14	

Through table (7) which represents the normative and non-normative transactions of the distinctive function for measurements of physical construction in the discrimination function template, through this we can obtain the following non-standard equation: Rated function = 14,699 + (skin bending thickness of the muscle-0,107) + (height 0,073) + (weight -0,167) + (chest width 0,124).

TABLE8: Average high and low-level groups

High level group	Low level group
- 0.543	0.55

TABLE9:Classification results of the two research groups according to the discrimination equation

Two group	Specimen	Correct classification	In correct classification
High-level female students	number	59	18
	ratio	76.6٪	23.4٪
Low-level female students	number	51	25
	ratio	67.1٪	32.9٪
Rating Success Rate of Equation = 71.9٪			

Through table (9) representing the classification results of the two research groups According to the discrimination equation, note that (59) of the group with a high level of (76.6%), correctly classified (distinguished), The number of female students not correctly classified was (18) and (23.4%).

We also note that (51) of the group with a low level of (67.1%), are correctly classified (distinguished), The number of female students not properly classified was (25) and (32.9%), The accuracy of the total rating was (71.9%).

Simulation results Table (4) on the analysis of incremental differentiation, where the table shows variables According to the order of its importance in the entry, then the direction, the value of my test and the centers of Lambada It is a product of additionality and morale, extremely the increasing multiple slope, differentiation analysis can be used as a means of reaching the best variable template , which leads to differentiation between the two groups (high and low level) Which indicates variables according to a particular combo, because the multiple statistical method of differentiation analysis The first variable with the largest amount of test is selected Then all remaining variables are re-evaluated To choose the variable made with the first variable the largest amount of test scheduled whether in addition or in isolation, Where it is again reassessed the variables within the equation to determine whether or not the test of isolation is achieved, If it achieves the test of isolation, it is isolated and so with the unchecked variable and then the selected variables.

Table 7 shows the distinctive function of normative and non-normative differentiation equation to predict high and low-level students. It is arranged according to the order of variables, where the first variable is shown to be the skin tuck thickness of the back of the ulna. The second variable is the length where we can say that the proportion is inverse between the length and the thickness of the skin tuck of ulna They are considered a physical ingredient that helps in the student's better achievement, and the weight (mass) was a negative variable Resulting in a lower level of physical performance among the students, the chest width was a positive factor affecting performance, and both equations can be used to classify high-level students (14,699). From table (9), the rating success rate of the equation is determined by its ability to reclassify sample individuals using the distinctive function, It refers to the function's ability to analyses differentiation.

CONCLUSIONS:

that variables (thickness tuck of ulna, height, weight, chest width) are the variables that affect the differentiation of female’s students in fitness to the group of high or low level, the standard fitness

Discriminatory Function has been Reached through which the applicant's membership of the group of high or low standard can be predicted, the fitness discrimination function has demonstrated the ability to discriminate successfully to a good degree.

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