CONSTRUCTION OF NORMS FOR THE VALID PHYSICAL EFFICIENCY TEST FOR PHYSICAL EDUCATION COMMON ENTRANCE TEST (PECET) IN ANDHRA PRADESH

Dr.P.Johnson,Principal, University College of Physical Education & Sports Sciences, Acharya Nagarjuna University, Guntur-522510, Andhra Pradesh, India

INTRODUCTION:

1. "Physical Education may be defined as an education through the physical where many of the educational objectives are achieved by means of big muscle play activities. It is a vital phase of education and an integral part of the total educational process".The vital phase of education, that is physical education, aims at all round development of an individual where the medium of achieving the goal is physical activity. Hence it is through the big muscle-play activity an individual can enlighten the personality traits such as physical fitness, emotional balance and social behavior etc., besides intellectual development.The physical education programme provides each student with an opportunity to assess his fitness, and to develop skill and understanding that will enable him to enjoy a productive stay in school/college and a more meaningful existence after school/college.

In a broad view of education, physical education has unique opportunities for developing desirable character and social traits as well as defined responsibilities toward the physical development of the individual. A person physically fit will be mentally alert and sound and will be more spectacular in all walks of his life. A weak child is a weak brick in the wall of the nation. If today's child is weak and meek, he is considered as a liability not only to his family and himself but also to the entire nation. The wealth of a nation depends entirely upon the health of every citizen of the country.

Measuring physical efficiency is just as complex a quality as intelligence to measure. Like intelligence it depends upon not a single quality, not single test. To measure physical efficiency, firstly, the parameter, which contributes to it, should be determined; secondly, an appropriate test should be selected to measure the specific parameter.

Right from the origin of Physical Education the major objectives of physical education was physical fitness. The aim of physical education in the early years attained physical fitness, which was a main requisite of the then citizens. As days changed the need, importance, scope and objectives have also changed because the demand of environment to preserve, to withstand stress, to resist fatigue and to possess the energy for vigorous and well-rounded life has increased.

Clarke has rightly defined physical fitness as "The ability to carry out daily tasks with vigour and alertness, without undue fatigue, and with ample energy to engage in leisure pursuits and to meet emergency situations".

The daily tasks of different individuals differ in nature from others as their life styles, work environments and leisure pursuits are different. All individuals,

have some degree of physical fitness, which varies considerably in different people and in the same person from time to time. Thus, the need of physical fitness has become a way of life in the modern society.

Here the role of a physical education teacher is vital, as he has to attend to various individuals with varying levels of physical fitness and varying levels of energy demands for carrying out their tasks. The physical educator should be competent enough to perform these highly specified tasks of attending different individuals with different traits and goals. They should be trained well and should possess the knowledge regarding physical education and its allied subjects besides being himself fit. For this purpose, the institutions, which train physical education teachers, should select the right person for the right job. As the responsibility of transferring the knowledge of physical education teachers, the institutions which train these personnel should not compromise in the principles of selecting and training these people. When the process of selection is involved the necessity of test, measurement and evaluation arises."Test is a specific tool, procedure or technique used to elicit a response from the student in order to gain information to be used as a basic for appraisal of the quantity or quality of elements such as fitness, skill, knowledge and values".Measurement is a technique of evaluation that uses tests and other procedures and instruments, is generally precise and objective, normally results in quantitative data and characteristically can express its results in numerical form when indicating ability or capacity is some trait or characteristics involving fitness motor skill knowledge, value or process."

MEASUREMENT AND EVALUATION :

Measurement and Evaluation are interdependent concepts Evaluation is a process that uses measurement and the purpose of measurement is to collect information. Tests are made for this purpose. In the evaluation process, information is interpreted according to established standards so that clear decisions can be made. Clearly the success of evaluation depends on the quality of the data collected. If test results are not consistent and truthful, accurate evaluation is impossible. The measurement process is the first step in evaluation improved measurement leads to accurate evaluation.

The measurement of man date back to ancient civilizations and is the oldest form of measurement. It was of interest in ancient India and later in Egypt [8] where the study was undertaken to find one part or component of the body that would predict or become a common measurement of all other parts of the body.

History reveals that as man becomes more civilized, he becomes more scientific to seek more exact ways to measure. The history of measurement in physical education parallels the growth and development in research and the rise of physical education too more respected position in the educational spectrum.

Modern techniques in measurement were developed only a little over 100 years back in few countries like America.[9] Their history can be divided roughly into periods of running from about 1960 to present.

Various measurement techniques for different elements were developed in different years.

Anthroprometric measurements	- 1860-1890
Strength tests	- 1880-1910
Cardio Vascular tests	- 1990-1925
Athletic ability tests	- 1900-1930
Sports skill tests	- 1920
Knowledge tests	- 1940
Fitness tests	- 1940

Physical fitness tests were developed at the time of World War II. These tests were geared to the need of the war period. They could be mass administered, easily scored and interpreted. All branches of armed forces devised fitness tests with appropriate norms. A number of such other tests were developed for schools and college groups as well as other institutions like fire fighters, police personnel etc.

Every institution has its own purpose in conducting a test and every test has its own purpose in measuring a specific quality in individuals. The various elements of physical fitness such as strength, speed, flexibility, endurance etc., have to be measured by using various test procedures.

The selection of appropriate test is necessary when application of results is to be realized. The little time allotted for measurement activities should be made in the light of objectives sought. If the tester is a teacher, detailed, technical measurement may be desired. The teacher is just concerned about the accuracy and honesty of the results but he has to find a test that is easy to use which is appropriate to the group situation that is present in most schools. The theme is centered on helping the teacher get the effective answer with the best tools; Judgement about test selection will continue to be needed as how tests become available.

According to Wayman, the real physical efficiency tests must determine, and take cognizance of an individual's physical deficiencies, there must be physical or mental reasons for them, and a real physical efficiency test would tend to show the physical reason. Then using this as an intelligent basis for procedure, one can treat the primary cause before attempting to improve the motor deficiencies.

Measurement and evaluation are an integral component in acquiring knowledge about one's self, and students in a school setting clients in a non-school setting, subjects in a research setting and the general public. It also provides information about curricula, programmes and instruction. Measurement tools and evaluation procedures can be motivating, informative and diagnostic. Frequently, the results of measurement and evaluation are used in assessing the accountability of the professional physical educator.

For years, it was assumed that students who attended the class were learning and that quality of life was enhanced. All of these assumptions may be true, but they cannot be certain unless systematic procedures are used for measurement and evaluation. Such assumptions may be very tenuous, and are likely to be challenged

by parents, school officials and leaders who are concerned with making schools accountable for the learning and the development of children.

Evaluation is inevitable in teaching. Like it or not, there are numerous instructional decisions that must be made and action taken accordingly. The more accurately he/she evaluates or judges his/her students and programmes, the more effective he/she will be in providing a sound educational experience.

In a general sense, the main purpose of teaching is to help students achieve desired learning outcomes in the cognitive, effective and psychomotor domains. Clearly defining the desired learning outcomes in terms of specific instructional objectives is the first step in good teaching: it is also essential in the effective evaluation of student achievement and learning.

Evaluation is the process of giving meaning to measurement by judging it against some standard. Two commonly used standards are: 1) criterion-referenced standard and 2) norm-referenced standard.

Criterion-referenced standard is concerned with the degree to which a student has a level of competence, it requires that the task should be defined in explicit terms.

Norm-referenced standard is based on statistical procedure, which is used to judge an individual's performance in relation to others of same age, sex and particular ability level. Therefore, norms are necessary in order to interpret the test scores, which are meaningless without this essential factor.

Many standardized tests were developed which were based on various scores and norms suitable for a specific population, age, sex or country as a show but as Ebel [13] defined "people are different that vary in body, size, shape, speed, strength and in many other respects. Measurements determines the degree to which an individual possesses a defined characteristic. It involves first characteristic to be measured and then selecting the instrument with which to measure it".

So the test which is intended to measure a particular group should be designed suitably for that group and the norms and standards should be fixed accordingly. Many test batteries like AAHPER youth fitness test. AAHPER Sports Skill Test, Indiana motor fitness test, Texas Physical fitness motor ability test, National Physical efficiency test etc., have be come universally acceptable and are being applied as devices of measurements in various institutions, states all over the world. Do these tests really test their efficiency? In the sense does a test constructed which is based on the scores of a particular population, be administered somewhere else in the world on different population? Do the local conditions influence or effect these studies? Such questions arise when we go deep into the testing procedures practiced in various institutes in India.

Physical education colleges all over India apply different testing procedures for selecting candidates for admission into there institutes for different educational courses they offer. Are those tests standard? For example, the YMCA College of Physical Education, Madras conducts a physical efficiency test for students aspiring for its Bachelor of Physical Education Degree Course, which

includes items such as 100mts. Run 800 Mts. run, Shot Put and Broad jump. Similarly the Annamalai University in Tamilnadu has test items like 100 m. run, sit ups, pull ups, vertical jump, and 12 min. run/walk for Bachelor of Physical Education and Sports Sciences course and the same test is being administered into Master of Physical Education and Sports Sciences Course also.

The investigator of this study who hails from Andhra Pradesh State, has been working in Physical Education department of Sri Krishnadevaraya University, Anantapur with rich experience in conducting entrance test for students who are opting for various courses in physical education at various colleges, has developed a sort of interest in analyzing the existing test procedures and construction of norms for selecting the candidates for admission into various physical education colleges in Andhra Pradesh.

Government of Andhra Pradesh evolved a common entrance test to select students into various physical education courses of their state like Under Graduate Diploma in Physical Education (U.G.D.P.Ed). Bachelor of Physical Education (B.P.Ed) and Master of Physical Education (M.P.Ed) under the G.O.Ms.No.161, Education, 4th May, 1989. To get admission into the U.G.D.P.Ed. and B.P.Ed., courses a student should pass the physical efficiency test - According to the Andhra Pradesh Government Gazette.[14]

The following test items were framed to find out the physical efficiency of students. They are :

MEN	WOMEN
1) 100 Mts. Run	1) 100 Mts. Run
2) 800 Mts. Run	2) 400 Mts. Run
3) High Jump	3) High Jump
4) Long Jump	4) Long Jump
5) Shot put.	5) Shot put.

The above tests are aimed at determining the individual's speed, endurance, explosive strength etc. The aim of administering these tests is also that an individual who can perform well in these tests should possess the elements of physical fitness like speed, strength, endurance, explosive strength and these components are very much essential for a student who has to undergo a vigorous training programme in the physical education courses.

Having associated with the common entrance test called, Physical Education Common Entrance Test (P.E.C.E.T) as an observer, tester and evaluator for five years i.e., 1992, 1993, 1994, 1995 and 1997 the investigator of this study felt that the present existing test items should be standardized and to construct norms according to the needs of the present local population and performance levels. Another important aspect where the researcher has decided to investigate is that the two particular items namely High Jump and long Jump which requires explosive strength in legs are similar in nature. So one of them may be eliminated from the test which also saves the time and feasible in administration. Either of the test items can be eliminated from the battery by finding the weightage of the items in the

battery by using Statistical Procedure, 'Multiple Linear Regression Analysis' and 'Correlation Matrix'. Furthermore Investigator wants to construct the Norms for the test items both for men and women.

Keeping the above factors in mind, the researcher felt the need of the present study for investigation.

STATEMENT OF THE PROBLEM:

The purpose of this study is Construction of Norms and standardizing the existing physical efficiency test items of Physical Education Common Entrance Test of Andhra Pradesh.

DELIMITATIONS:

The study was delimited to the following aspects:

- Study was conducted on those students who appeared for the Physical Education Common Entrance Test (P.E.C.E.T) in Andhra Pradesh.
- Both men and women students seeking admission into Bachelor of Physical Education were selected as subjects. Their age ranged from 20 to 23 years.
- Functional relationship was established by following multiple regression analysis in the first case the functional relationship was established between criterion variable and all the other independent variable. In the second analysis high-jump was dropped and in the third long jump was eliminated because as earlier mentioned the researcher made an attempt to eliminate one of the above two variables which asses the same quality.

LIMITATIONS:

1. As the test was conducted at three different places of three respective regions, consists 23 districts of Andhra Pradesh., the ground conditions, climate and some other external factors might have had an effect on the study.
2. The tests were not conducted and the researcher did not take himself the measurements. Whatever the scores the testers submitted to the Convenor of P.E.C.E.T. were taken for study.(However the researcher was an observer at all the three centres)
3. As the personnel involved in conducting the test and measuring the scores were large in number and different people were testers at different places, there may be variations in testing procedures. The tester reliability could not be established by using any standard criteria. However all the persons involved in testing and measuring procedures were well qualified people working as teachers in physical education, physical directors and coaches.
4. The tests were conducted at various places of diverse climatic and terrestrial conditions and hence the influence, if any, of the natural setup of the places of the test was not accounted for during the computation of the Norms.

DEFINITION AND EXPLANATION OF TERMS

PHYSICAL EFFICIENCY TESTS :

Those objective tests used to measure learnings which include ability, motor fitness, sport skill, posture and nutrition.

PHYSICAL FITNESS : Fitness is that state which characterizes the degree to which a person is able to function efficiently. Fitness is an individual matter. It implies the ability of each person to live most efficiently within his potentialities.

PHYSICAL EFFICIENCY : The totalfunctional capacity to perform some specified task requiring muscular effort: Considers the individual involved, task to be performed, quality and intensity of effort, one aspect of total fitness, involves sound organic development, motor skill and the capacity to perform physical work with biological efficiency.

TEST : A set of questions, problems, or exercises for determining a person's knowledge, abilities, aptitude or qualifications. A specific tool of measurement for the collection of data, implying a response from person being measured.

NORMS :"Norms are derived scores that are determined from the raw score obtained by a specific test".

A norm is a scale that permits conversion from a raw score to a score capable of comparisons and interpretations. Norms are representations of some large population. They should be based on particular type of group that is well identified. Norms should be based on large number of cases. Other factors must be geographic location, race and skill level.20

PHYSICAL EDUCATION COMMON ENTRANCE TESTS (P.E.C.E.T.):

The examination conducted for assigning merit ranking to students which will be the basis for admission of the students into courses, namely Undergraduate Diploma in Physical Education (U.G.D.P.Ed.) Bachelor of Physical Education (B.P.Ed) and Master of Physical Education (M.P.Ed.) offered in various institutions of physical education, functioning under Government, Campus/Constituent of Universities and Private Managements. This test will be conducted by the Convenor, appointed by the State Council, on different dates at different centres of three regions of Andhra Pradesh as specified by the State Council in consultation with the Chairman of Entrance Test Committee.[21]

For this study the data of men and women students seeking admission into B.P.Ed. course was considered. The items of the physical efficiency test were 100 Mts., 800 Mts. (400 Mts. for women), High-jump, Long-jump and shot-put.

SIGNIFICANCE OF THE STUDY

- The result of this study may help in construction of norms and standardize the test items for future Common Entrance Test.
- The study will help in the selection of suitable students to get admission into the physical education profession it provides standards on physical education programme.
- Based on the results, the number of test items may be altered as per the requirement.
- This study may contribute to the knowledge of physical education in general and test measurement and evaluation in particular.

- The results and finding of the study can be submitted to the Government and necessary actions can be recommended.
- Finally, it will help the physical education personnel to diagnosis the strength and weakness of pupils, to measure their fitness growth and use the test results for other instructional and guidance purposes.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY:

Physical education emphasizes the importance of physical activities, as they are directly related to growth and development of an individual. Physical fitness movement is another development that is received wide attention in all segments of the society.

Here the role of physical education teacher is vital, as he/she has to attend various individuals with varying level of physical fitness and varying level of energy demands for carrying out their tasks. He should be trained well and should possess the knowledge regarding physical fitness.

The purpose of this study is construction of valid norms and standardizing the existing physical efficiency test items for physical education common entrance test in Andhra Pradesh. It helps to assess the students efficiency which will be the base for admission of the student into physical education courses in Andhra Pradesh.

For this study data have been collected from three regions of Andhra Pradesh i.e., Rayalaseema, Andhra and Telangana covering 23 districts consist of 1050 male and 628 female students in random sample represented the same numbers from each district. The age groups between 20 to 23 years were taken as subjects for the study. To standardise the data only those candidates who obtained the minimum standards (30 percent aggregate out of five items expected to qualify) are considered. Thus, the sample is filtered down to 851 male and 499 female candidates for the purpose of this study.

The aim of the study was to find out the association of independent variables i.e., 100 mts. run, 800 mts. run (400 mts. for women), High jump, Long jump and Shot-put, with criterion variable (some of the scores of five variables) to standardise and to select the valid test items for physical efficiency test in relation to physical education common entrance test in Andhra Pradesh. Further, the study extended to construct the new norms for the test items.

MEN – PHYSICAL EFFICIENCY TEST RESULTS:

For this study statistical method “Multiple linear Regression Analysis” was applied to find out relationship of independent variables namely: 100 mts run (X_1), 800 mts run (X_2), High jump (X_3), Long jump (X_4) and shot put (X_5) with criterion score (Y) (some of the scores of five variables).

The estimated regression coefficient of all independent variables, except X_1 shows positive and significant effect on criterion score (Y). The coefficient of X_1 is negative and significant. It means an increase in one unit of X_1 variable will decrease the criterion score by 5.25 units. It represents the negative relationship

with criterion score. The negative and significant value reveals that there is a scope to increase the standards and norms of Y by standardising the norms in X_1 variable. The estimated X_2, X_3, X_4, and X_5 variables shows positive relationship with the criterion score individually. An increase in one unit of each and above four variable will increase the criterion score by 1.135, 1.411, 4.046 and 2.171 units respectively. This positive relationship is significant at 5 percent probability level on criterion score. The estimated values of R^2 is 2.064 and F – test is 327.80 and it is significant at 5 percent probability level.

From the correlation matrix it is observed that the High jump variable shows negative relationship with 800 mts. and positive relationship with 100 mts. and shot put variable. The High jump and Long jump variables having the positive correlation with each other. In the case of Long jump variable, positive relationship was observed with all explanatory variables. The relationship between shot-put and 800 mts. is negative. Where as the other variables relationship with shot-put is positive. 100 mts. run having positive association with other variables independently. The 800 mts. run shows negative relationship with High jump variable.

In the second model, the functional relationship was established on explained variable (Y) dropping the High jump variable (X_3). The estimated regression coefficients of all independent variables except 100 Mts. run (X_1) shows positive and significant effect on criterion score (Y). The coefficient of X_1 is negative and significant. It represents the negative relationship with criterion score variable. It means an increase in one of unit in X_1 variable will decrease the criterion score by 4.84 units. An increase in one unit of X_2, X_4, and X_5 variables will increase the criterion score by 1.052, 4.521 and 2.508 units respectively. This positive relationship is significant at 5 percent probability level on Y. The multiple correlation coefficient R^2 is 1.822 and F- test is 468.89. The values are significant at 5 percent probability level.

By dropping of High jump variable (X_3), the collective effect of remaining variables on Y decreases 0.232 units. It shows that the net effect on High jump variable on Y is 0.232 units. Hence the effect of X_3 variable will decrease the 23 percent in total relationship with criterion score. Dropping of X_3 variable resulted 41 percent increase in weightage for 100 mts. score, 8 percent decrease in weightage for 800 mts. score, 47.5 percent increase in weightage for Long jump score and 33.7 percent increase in weightage for shot-put score. The total variation in criterion score was decreased by 23 percent was observed by dropping the High jump variable over the first model.

In the third model, Long jump variable (X_4) was dropped, then the functional relationship was established on explained variable Y. The estimated regression coefficient of all independent variables except X_1 shows positive and significant effect on criterion score Y. The coefficient of X_1 is negative and significant, it means an increase in one unit in X_1, variable will decrease the criterion score by 1.276, 1.992 and 3.335 units respectively. This positive relationship is

significant at 5 percent probability level on criterion score. The estimated value of R^2 is 1.215 and F – test is 1197.51 and it is significant at 5 percent probability level. Comparing the first model, the dropping of X_4 variable from the test, it decreases 42 percent weightage on the criterion score Y.

The effect of dropping Long jump variable increases 200 percent in 100 mts. score 58 percent in High jump score and 126 percent in shot-put score and 14 percent in 800 mts. score. The total variation in criterion score was decreased by 41.1 percent by dropping of Long jump variable over first model.

WOMEN – PHYSICAL EFFICIENCY TEST RESULTS:

The statistical technique which is applied for men, i.e., 'Multiple Linear Regression Analysis' was applied for women data. In the first model of the study, the estimated regression co-efficients of all independent variables except X_2 (400 Mts.) shows positive and significant effect on criterion score (Y). The co-efficient of X_2 is negative and significant. It means an increase in one unit of X_2 will decrease the criterion score by 5.64 units. It represents the negative relationship with criterion score. It reveals that there is a scope to increase the test value by standardising the norms of X_2 variable. The estimated X_1, X_3, X_4 and X_5 variables shows positive relationship with criterion score individually. This positive relationship with Y value is significant in the cases of X_3, X_4, X_5 variables only. In the case of X_1 variable, the relationship with Y is not significant. An increase in one unit of each and above four variables X_1, X_3, X_4 and X_5 will increase the criterion score by 0.174, 0.508, 1.756 and 2.587 units respectively.

The multiple correlation co-efficient R^2 value is 3.598, and the estimated F-test value is 136.55. It is inferred that the values are significant at 5 percent probability level.

The estimated correlation matrix shows that the 400 Mts. variable having negative relationship with the 100 Mts., and High jump. It shows positive relationship with Long Jump and Shot Put. The High Jump and Long Jump variables having positive correlation with each other. Long Jump is having positive relationship all other variables. The relationship between Shot Put and other variables is positive. 100 Mts., having positive association with High Jump, Long Jump and Shot Put and negative relationship with 400 Mts. run. The 400 Mts. run shows negative relationship with High Jump and positive relationship with Long Jump and Shot Put variables.

In the second model High Jump X_3 variable was dropped. The relationship was established between criterion score (Y) and the independent variable X_1, X_2, X_4 and X_5. The estimated co-efficient of all independent variables except X2 shows the positive and significant effect on the Y. This positive relationship is significant at 5 percent probability level. In the case of X_1, it is observed that there is a positive and significant relationship at 10 percent probability level. The estimated R^2 is 3.555 and F-test value is 171.84. The values are significant at 5 percent probability level. Exclusion of High Jump variable, the values is estimated and it shows in decrease of 4.3 percent on criterion score over

the first model. Dropping of High Jump variable the correlation matrix resulted as 14 percent increase in weightage for 100 Mts. score, 10 percent decrease in weightage for 400 Mts. score, 1 percent increase in weightage for Long Jump score and 8 percent increase in weightage for Shot Put score.

In the third model, by dropping the Long Jump variable (X_4) from the first model the functional relationship was estimated between the criterion score Y and the independent
variables X_1, X_2, X_3, X_5. The regression coefficient of all independent variable except X_2 (400 Mts.) shows positive and significant effect on criterion score. An increase in one unit of X_2 variable will decrease the criterion score by 5.62 units, and other three variables X_1, X_3 and X_5 will increase the criterion score by 0.650, 0.494 and 3.620 units respectively. This positive relationship is significant at 5 percent probability level.

The estimated values of R^2 is 3.426 and F-test is 174.42 and it is significant at 5 percent probability level.

Dropping of Long Jump (X_4) variable from the model shows some decrease in the collective effect of the independent variables. It is observed as 17.2 percent. It shows that dropping of X_4 variable will decrease the variable relation with the criterion score.

The results of the correlation matrix after dropping Long Jump variable resulted as 48 percent increase in weightage for 100 Mts. 2 percent increase in weightage for 400 Mts. 1.4 percent decrease in weightage for High Jump score and 103 percent increase in weightage for Shot Put scores. The total variation in criterion score was decreased by 5 percent while dropping of Long Jump variable from the first model.

RESULTS OF PHYSICAL EFFICIENCY TEST NORMS FOR MEN AND WOMEN:

Norms were constructed by using Hull scale. The scale that based on the properties of normal curve. Hull Scale extends 3.5 standard deviations on either side of the mean. Investigator feels that this scale is more appropriate because the scores within the scale are well spread.

Critically comparing the new norms with the conversion norms, it is noticed that the new norms are having better results than the conversion norms. Norms given in the present study the scores are covers from 1-100, whereas these are they are from 10-100 in conversion norms. The performance of men and women items finds lot of difference in upper and lower limits of the scores and performances in new norms whereas comparing with conversion norms. Conversion norm score points are not continuously given and the incremental value is not uniform. Whereas uniformity is strictly maintained in the new norms. It is find that the range of performance increase in new norms which helps in measuring the increasing as well as decreasing performance levels of the individuals. The performance records of High Jump and Long Jump are measured in meters and centimetres, which is more suitable method in present days. Whereas

in present norms it measures in feet and inches. The lower limit scores are calculated from one in new norms whereas it is truncated at 10 in conversion study which infact not appropriate in measuring the performance of individuals.

Finally, it is noticed that Hull scale is more appropriate and also has a theoretical background , which helps in construction of norms, for various items.

CONCLUSIONS:

The analysis and conclusions of the present study was given in this chapter. The analysis was drawn individually both for men and women. From the analysis the following conclusions were drawn.

PHYSICAL EFFICIENCY TEST FOR MEN:

The estimated regression coefficient of all selected variables on criterion score, shows significant effect. The variable 100 Mts. run shows negative effect on criterion score. The negative and significant effect of this variable expresses there is some scope to increase the standards and norms of criterion score by standardising the norms of this variable 100mts. run. The remaining 4 variables having positive and significant relation with criterion score. It is observed that the effect of these variables is positive i.e., increasing the norms of these variables will increase the standards of the criterion score. From the value of multiple correlation coefficient, it can be inferred that the total effect of all variables is significant on criterion score. It means the norms of these independent variables is strengthen the standards of criterion score at significant level.

The Estimated Equation, After Dropping High Jump Variable, Will Show The Similar Effect As Compared To The First Equation, When All Variables Are Included In The Model. Comparing The Values Of The Multiple Correlation Coefficient Of Two Models, 23 Percent Collective Effect Was Decreased On Criterion Score By Dropping The High Jump Variable. From The Results Of Third Model, When Dropping The Long Jump Variable, The Collective Effect Of Variable On Criterion Score Was Decreased Nearly 42 Percent Over The First Model. Comparing These Decreases (High Jump 23 Percent, Long Jump 42 Percent) In Norms And Standards Of Criterion Score Dropping The High Jump Variable Than The Long Jump Variable In A Good Decision In Standardising The Test Items And To Construct Norms For The Test.

PHYSICAL EFFICIENCY TEST FOR WOMEN:

The estimated regression coefficient of all selected variables on criterion score shows significant effect. The X_2 (400 Mts.) variable shows negative effect on criterion score. The negative and significant effect of these variables expresses that there is some scope to increase the standards and norms of criterion score by standardising the norms of these 400mts. run. The remaining four variables having positive and significant relation with criterion score. It is observed that the effect of these variables is positive and by increasing the norms of these variables will strengthen the dependent variable in the test. From the values of multiple correlation coefficient, it can be inferred that the total effect of all variables is

significant on criterion score. It means the norms of these independent variables are strengthening the standards of criterion score at significant level.

The estimated equations, after dropping High Jump variable, will show the similar effect as compared to the first model, when all variables are included in the model.

Comparing the values of the multiple correlation coefficients of two models, 4.3 percent collective effect was decreased on criterion score by dropping the High Jump variable. From the results of the third model, when dropping the Long Jump variable the collective effect of variable on criterion score was decreased nearly 17.3 percent over the first model.

Comparing these decreases (High Jump 4.2 percent, Long Jump 17.3 percent) in norms and standards of criterion score, dropping the High Jump variable than the Long Jump is a good decision in standardizing the test items and construction of norms for the test.

NORMS FOR PHYSICAL EFFICIENCY TEST (MEN AND WOMEN):

New norms are constructed by using 'Hull Scale' statistical technique. This method is having more authentic and appropriate to construct the norms. From the study the following conclusions are drawn.

The norms for variables (Items) start from 1-100, with an incremental value one.

The performance limits in either side (upper and lower) shows a lot of difference in both men and women tests.

It measures in more accurate upto three decimal points.

Uniformity is maintained in measuring performance i.e, incremental values are strictly maintained.

The performance records of High Jump and Long Jump is measured in meters and inches, which is a latest method of measuring in the performance levels.

The range in performance is increased, it helps in measuring the increasing as well as decreasing performances of the individual.

Norms are constructed by using Hull Scale technique. It is more authentic and has more theoretical support.

RECOMMENDATIONS :

Based on the conclusions of the study the following recommendations have been made :

For standardised physical efficiency test in Physical Education Common Entrance Test (PECET) four variables (items)test is suitable rather than five variables.

The study recommends that the standardised physical efficiency test for men is

- 100 Mts. run to measure speed
- 800 Mts. run to measure endurance
- Long Jump to measure Leg explosive strength
- Shot Put to measure Arm and shoulder griddle strength

The study recommends the standardised physical efficiency test for women is

- 100 Mts. run to measure speed

- 400 Mts. run to measure endurance
- Long Jump to measure Leg explosive strength
- Shot Put to measure Arm and shoulder griddle strength

Study recommends that the elimination of High Jump item from the test will not effect much on test score.Standardized norms for physical efficiency test were constructed for men and women tests.Similar study may be conducted for further simplifying the test items.Similar study may be recommended to standardise for various efficiency tests.Present study gives an idea to formulate exact test to find out related components.Present study gives guide lines to formulate standards and norms for test.Present study helps to select standardised technique to measure and to fix correct norms for various physical efficiency test, which are existing or coming up in future.

REFERENCES

1. Harold M. Barrow, Rose Mary Mc Gee. **"A Practical Approach to Measurement in Physical Education",** 3rd Ed. (Philadelphia: Lea & Febigal, 1979), P.6.
2. Arthur H. Steinhaus, **"The Challenge of Health Education to the YMCA"** cited by Wynn F. Updyke and Perry B. Johnson, Principles of Modern Physical Education, Health and Recreation (New York: Holt, Rinehart and Winston Inc., 1970) P.29.
3. Emerson R.W. "**The American Schools, ed. American Literature of the Nineteenth Century"** An Anthology: Eurasia Publishing House (Pvt.) Ltd., New Delhi (1955) P.48.
4. H. Harrison Clarke, **"Definition of Physical Fitness"** Journal of Physical Education and Recreation, 50, No.8 (Oct. 1979) P.28.
5. Harold M. Barrow., Rose Mary Mc Gee., **"A Practical Approach to Measurement in Physical Education",** 3rd Ed. (Philadelphia: Leas & Febiger, 1979), P.7.
6. Cureton T.K., **"Physical Fitness Appraisal and Guidance",** (St. Lous: The C.V. Mosby Co., 1947), P.397.
7. W.L. Foster, : **"A Test of Physical Efficiency",** American Physical Education Review, 19:132 (1941).
8. Agnes R. Wayman, **"Testing and Scoring the Physical Efficiency of College Women",** Research Quarterly, 1 (1930), P.75.
9. Agnes R. Wayman **"What to Measure in Physical Education",** Research Quarterly, 1 (1930), P.97.
10. N.E. Gronlund, Measurement and Evaluation in Teaching (4th ed.) cited by Larry O.Hensley, **"Current Measurement and Evaluation Practices in Professional PE",** Journal of Physical Education, Recreation and Dance, 61, 3 (1990), P.32.
11. Ebel., **"Measuring Educational Achievement"** as mentioned by Clarke & Clarke in Application of Measurement to Physical Education (New Jersey: Prentice Hall, 1987), P.13.
12. The Andhra Pradesh Gazette (Published by authority, No.22, May 1989). Government of Andhra Pradesh.

13. Ted A. Baugartner, Andrew S. Jackson., **"Measurement for Evaluation in Physical Education and Exercise Science",** 3rd Ed. (lowa: W.C. Brown Pub., 1982), P.276.
14. Hockey, Physical Fitness: A Pathway to Healthful Living, P.8.
15. M.D. Hunter, "**A Dictionary for Physical Education",** (Bhoomington: Indian University Press, 1966).
16. Barrow Harold M., Mc Gee Rose Mary, **"A Practical approach to measurement in Physical Education",** 3rd Ed. (Philadelphia: Lea & Febiger, 1979), P.578.
17. Margaret J. Safrit, **"Evaluation in Physical Education Assessing Motor Behaviour",** (Englewood Cliffs, New Jersey: Prentice Hall Inc., 1981), P.243.
18. Harold M. Barrow and Rose Mary Mc Gee, **"A Practical Approach to Measurement in Physical Education",** (2nd Ed.) (Philadelphia: Lea & Febiger, 1979), P.45.
19. The Andhra Pradesh Gazette, (Published by the Authority No.22, Hyderabad, 1989).