COMPARATIVE STUDY OF HEALTH RELATED PHYSICAL FITNESS COMPONENTS OF URBAN AND RURAL FEMALE STUDENTS OF GUDER SECONDARY AND PREPARATORY SCHOOL, ETHIOPIA

Ewunetu Tamene Woldeyes*

Molla Deyou**

Sangeeta Rani**

ABSTRACT

The study was conducted to compare health related physical fitness components of urban and rural female students of Guder secondary and preparatory school. Thirty (15female from urban and 15female from rural) students were selected as subjects and their age were16-18 years. The participants participated in supervised training program 3days/weeks for 12weeks. The physical fitness variables selected for the study were; cardiovascular endurance, muscular strength, muscular endurance and flexibility. Data were analyzed using SPSS and comparisons of mean at 95% confidence interval of the difference. The results and conclusion of the study revealed that, the urban female students were stronger in cardio-vascular endurance than the rural group. There was no significant difference in the muscular strength levels of the sampled rural and urban female students, but the urban groups were again found to be stronger in muscular endurance than the rural female students. Significant differences were observed when flexibility were tested. As a summary, urban female students are superior to rural female students in cardiovascular endurance, muscular endurance and flexibility, whereas rural female students

* Instructor, West Shoa Zone Guder Secondary School, Ethiopia

** Assistant Professor, Haramaya University, Haramaya, Ethiopia

are superior to urban female students in muscular strength. This shows that regular energetic activity produces physical fitness improvements. Urban life style is more active in nature than the life in rural areas which produced high level of physical and physiological functioning in urban. A lot could be done to improve the health-related fitness levels of female students in the rural school.

Key Words: *Health related physical fitness variables, urban female students, rural female students,*

1. INTRODUCTION

Concept of physical fitness is as old as humankind. Throughout the history of mankind physical fitness has been considered an essential element of ever day life. The ancient people were mainly dependent upon their individual strength, vigor and vitality for physical survival. This involved mastery of some basic skills like strength, speed, endurance, agility for running, jumping, climbing and other skills employed in hunting for their livings. Physical fitness is deterioration in adult across all genders, ages and racial/ethnic groups [7]. The negative effects of degraded physical fitness on both the individual and society are serious and multi-dimensional. It can cause many risk factors to health including coronary heart disease, certain forms of cancer, diabetes, hypertension, stroke, gall bladder diseases, osteoarthritis, and respiratory problems and is associated with increases in all cause mortality [3]

In adults, relationship among physical activity, health related fitness, and health are fairly well established. Low levels of physical activity and cardio-respiratory fitness are both associated with higher risk of all cause and disease specific mortality. Physical fitness is the ability to perform daily activities willingly and actively. Physical fitness includes not only components of sports but those of health as well as regular physical activity prevents or limits weight gain, and gain in body mass index (BMI) [8].

The National College of Health Risk Behavior Survey reported that 35% of American college students are overweight [[10]. This is not surprising considering that more than two thirds of

American adult population are classified as overweight [6], making weight gains America's leading health problem [12]. The expert committee of the World Health Organization (WHO) described physical fitness as "the ability to undertake muscular work satisfactorily." Every person has a different level of physical fitness which may change with time, place of work, situation and there is also an interaction between the daily activities, and the fitness of an individual, the point if where to put the level of optimum fitness. From the physiological point of view physical fitness may say to be the ability of a body to adopt and recover from strenuous exercise.

1

Physically fit child feels more alert and eager to do things. A weak child is a weak brick in the wall of the nation. The wealth of a nation depends entirely upon the health of every citizen of the country. Hence physical fitness of school children is major factor to be considered. So, School physical education programmers should include multi furious activities appropriate to each age group. The complex nature of physical fitness can best understood in terms of its components such as cardio-vascular endurance, strength, flexibility and muscular endurance. In addition to these components of physical fitness there are many other factors which contribute to physical fitness including heredity, living standard, nutrition, hygienic conditions, environmental and climate factors etc. In general sense, health can be related with physical fitness According to a recent view point, Physical fitness has two dimensions via health related fitness and motor fitness. Physical fitness is a highly complex phenomenon. In the literature various definition of Physical fitness is given.

According to President's Council on Physical fitness and sports (2005), Physical fitness is the ability to carry out daily tasks with vague and alertness without undue fatigue and with ample energy to energy leisure time pursuits and to meet unforeseen emergencies.

Many research studies says exercise are important for the development of all physical fitness but few research were done on the area of health related physical fitness components such as cardiovascular endurance, muscular endurance, muscular strength, body composition and flexibility. Now days in our country Ethiopia, because of sedentary life style most people are attacked by chronic disease such as coronary heart disease, hypertension, diabetes, and so on. This is caused by lack of awareness. In Guder school people are living sedentary lifestyle due to

poor culture. So the research was done in this place by keeping the aim to compare the health-related physical fitness components among Rural and Urban female Student of Guder Secondary and Preparatory School.

2. MATRIALS AND METHODS

2.1SUBJECTS

For this study 30 (15 rural and 15 urban) female students with age of 16-18 years old were selected from Guder Secondary and Preparatory School. The pre, during and post test on selected health-related physical fitness parameters was administered for the selected subject. The participants were engaged in designed program for twelve weeks such as stretching, jogging, rope jumping, push up curl up. including warming up ,stretching and cooling down exercise with moderate intensity for three days per week (Monday, Wednesday and Friday), for 40 min per day for three months.

2.2 Research Design

For this study 30 (15 rural and 15 urban) female students with age of 16-18 years old were selected from Guder Secondary and Preparatory School. In this study the complete randomize design (CRD) was applied. The pre, during and post test on selected health-related physical fitness parameters was administered for the selected subject. The participants were engaged in designed program for twelve weeks such as stretching, jogging, rope jumping, push up curl up. including warming up ,stretching and cooling down exercise with moderate intensity for three days per week (Monday, Wednesday and Friday), for 40 min per day for three months.

2.3 Sampling Techniques and Procedures

For the present investigation stratified random sampling was used. The sample size was containing a total of 30 female students with age 16-18 years old. Among these the researcher allocated 15 female students from rural and 15 female students from urban group for exercise program.

2.4 Instruments And Testing Setup

Measuring tape, stop watch, whistle, pen, paper, wooden blocks, mats, horizontal bar was used as instruments for the training as well as to collect the data during the test.

2.5Procedures

The American Alliance for Health, Physical Education, Recreation and Dance youth fitness test was selected for the purpose of developing norms. A parameter of health related physical fitness variables was recorded especially for pre test, during test and for post test.

2.5.1 Pull Ups test

The bar was adjusted to a height that permitted the subject to hang free from the floor. From the hanging position with an over hand grip (palms for ward) the body was pulled upward until the chin rest over the bar, and then lowered until the arms straight. The subject was not supposed to use kicking, jerk or using a 'hip' movement. The maximum number of pull ups done within 30 seconds was taken as the score.

2.5.2 Bent Knee Sit Ups (1min)

The subject lay down on her back with knee bent held feet on the floor and heels not more than 12 inches from the buttocks, then put her hands on the back of the neck with finger clasped and placed elbow square by on the mat. Their foot was being hold by a partner to keep them in contact with the floor. The number of sit ups done in one minutes was be taken as her score.

2.5.3Sit and reach test

This test involved sitting on the floor with legs stretched out straight ahead with bear footed. The soles of the feet were placed flat against the box. Both knees were locked and pressed flat to the floor. With the palms facing downwards, and the hands on top of each other or side by side, the subject reaches forward along the measuring line as far as possible. Ensure that the hands remain at the same level, not one reaching further forward than the other. The participants were asked to pull forward their body as much as possible and hold the possible for one-two seconds while the distance was recorded. The score was being recorded to the nearest centimeter or half inch as the distance reached by the hand.

2.5.41,600M Run/ Walk

The subject was being asked to take a standing position and start. At the signal ready? Go! The subjects start running the 1,600Mrun/Walk. For this test the participant had to maintain the pace to complete the race. The score was the time taken to complete the course in minutes and seconds.

2.6 Statistical Analysis

A total of 30 students of female individuals were selected for the study. From a total of 30 students 15 of them were selected from urban and 15 of them were from rural areas. From the total number of the study subjects; no one was lost. 100% the study subjects; follow up the training properly Data obtained from the tests and measurements was analyzed through statistical package software (SPSS version 16.0) using descriptive statistics such as mean, standard deviation, and t-test used to compare the data. The level of significance was 0.05%.

3. RESULTS AND DISCUSSION

Table 4.1 Pre, Dur, Post Test Mean values for Cardiovascular Endurance

Test	N	Urban group	Rural group	Sig.
Pre- test M±SD	15	10.73±1.33	9.03±1.21	.00*
Dur-test M±SD	15	9.32±1.36	8.66±1.01	.00*
Pos-test M±SD	15	8.45±1.41	8.39±0.83	.00*

$p < .05$ * = Significant

The above table showed that almost there was no mean difference between the cardio-vascular endurance fitness levels of the rural and urban groups.

Table 4.2 Performance Evaluation Test of percentage Analysis of Cardiovascular Endurance

	Urban		Rural	
Rating	N	%	N	%
Good work	8	53.3	5	33.3
Well done	6	40	7	46.7
Sign of warning	1	6.7	3	20
Need Improvement	0	0	0	0

Total	15	100	15	100

The data (table 4.2) showed that, the urban female students were stronger than their rural counter parts. As high as 53.3%of the urban female student scored within good work and 40% of the urban scored well done, and 6.7%of them were sign of warning, whiles 33.3% of the rural scored within good work and 46.7%of them were well done, and as much as 20% scored within sign of warning. This meant that more urban female students were stronger in cardiovascular endurance as compare to ruler female students.

The higher cardiovascular fitness of the urban group could be due to the fact that most of the urban female students were relatively well equipped than in the rural areas.

Table 4.3 Pre, Dur, Pos Test Mean values for Muscular Endurance

Test	N	Urban group	Rural group	Sig.
Pre- test M±SD	15	28.66±1.29	29.03±2.85	.00*
Dur-test M±SD	15	32.40±1.63	31.60±2.87	.00*
Pos-test M±SD	15	36.53±1.68	34.26±2.84	.00*

p < .05 * = Significant

The above table revealed that, there was a significant difference in the muscular endurance levels of urban and rural female students after they engage in physical exercise. Both urban and rural female students were almost the same mean value but urban students were scored a slight difference of 3% than that of rural female students.

Table 4.4 Performance Evaluation Test of percentage Analysis of Muscular Endurance

	Urban		Rural	
Rating	N	%	N	%

High performance	0	0	0	0
Good	2	13.3	0	0
Fairly	13	86.7	11	73.3
Need Improvement	0	0	4	26.7
Total	15	100	15	100

From Table 4.4, it is clear that there was no difference in the percentage attainment for High performance for both the urban and the rural sampled groups. From the above table 13.3% of urban group was in good condition with that of rural female students. From the statistics a higher percentage of (86.7%) of the sampled urban female student and 73.35% of rural scored fairly as competed to urban. 26.7% of rural female students Need Improvement rating.

It has been shown by [5] that athletes and people interested in jobs requiring high-level performance such as curl-ups are, likely to benefit from good muscular endurance fitness. Research people who train for strength gain as much endurance as those who train for endurance and vice versa. As female students, there is the vital need for muscular endurance development throughout life [1].

Miller has postulated that muscular endurance is important in our daily activities such as walking, working, and playing which involves muscular contraction and relaxation, and that people who possess good muscular endurance are said to have a greater working capacity[11].

Table 4.5 Pre, Dur, Pos Test Mean values for Muscular Strength

Test	N	Urban group	Rural group	Sig.
Pre- test M±SD	15	9.13±1.45	9.26±1.62	.00*
Dur-test M±SD	15	11.00±1.64	11.06±1.33	.00*

Pos-test M±SD	15	12.53±1.40	12.86±1.24	.00*

p < .05 * = Significant

The above table showed there was no significant difference in the Muscular Strength fitness levels of the sampled urban and rural female students. Rural female students were slightly muscular strengthened than that of urban students but it is not as much big difference when compare their mean values.

Table4. 6 Performance Evaluation Test of percentage Analysis of Muscular Strength Test

	Urban		Rural	
Rating	N	%	N	%
Athletic	5	33.3	6	40
High	9	60	9	60
Healthy	1	6.7	0	0
Total	15	100	15	100

The Performance Evaluation test result presented by above table indicated a slight difference between the sampled two groups of female students in terms of Muscular Strength. From the statistics both groups had their members attaining High and Athletic rating. The remaining person, representing 6.7% of the urban group scored within Healthy.

The presented statistics revealed that the rural female students were slightly more Muscular Strength than the urban female students. The findings on muscular strength, as revealed by the above table 4.6 showed a statistically significant difference between the two groups. The difference in muscular strength might be due to the fact that agricultural work was part of the

regular activities in the rural female students. The relative difference in nutrition between the two group samples could also explain the statistically significant strength difference.

Table 4.7 Pre, Dur, Pos Test Mean values for Flexibility

Test	N	Urban group	Rural group	Sig.
Pre- test M±SD	15	28.73±2.08	28.06±3.10	.00*
Dur-test M±SD	15	32.60±2.64	31.00±3.52	.00*
Pos-test M±SD	15	37.46±3.39	34.46±4.45	.00*

$p < .05$ S = Significant

The above mean and standard deviation paired result showed that there was a significant difference in the flexibility fitness levels of the sampled urban and rural female students. From the above table the total mean value of urban female students scored were greater than that of rural this showed that urban female students were flexible than rural female students.

Table4. 8 Performance Evaluation Test of percentage Analysis of Flexibility

	Urban		Rural	
Rating	N	%	N	%
Good work	10	66.7	5	33.3
Well done	5	33.3	4	26.7
Sign of warning	0	0	6	40
Total	15	100	15	100

The performance Evaluation test result presented in table 4.9 indicated a difference between the sampled two groups of female students in terms of flexibility. From the statistics both groups had their members attaining well done and good work. The remaining person, representing 40% of the rural group performed within the sign of warning. The presented statistics revealed that the urban female students were more flexible than rural female students.

All these activities involved vigorous movement of the joints of the body. This result was supported by previous findings of[11], that active people are more flexible than inactive individuals. Since all the subjects were in their youthful ages and active in a wide range of movements, their loss of extensibility might be minimal. Another fact was that, the subjects were youths and their muscles were capable of stretching far enough forward due to the soft tissues (ligaments, tendons) of the joints, as well as the muscles.

4. Conclusions

Based on the major summary of the study, to minimize the difference between physical fitness of urban and rural female students of Guder Secondary and Preparatory School the following points are stated as conclusion.

Urban female students are superior to rural female students in cardiovascular endurance, muscular endurance and flexibility, whereas rural female students are superior to urban female students in muscular strength. This shows that regular energetic activity produces physical fitness improvements. Urban life style is more active in nature than the life in rural areas which produced high level of physical and physiological functioning in urban.

5. Acknowledgements

The first thanks goes to my major advisor Dr.Molla Deyou and Dr. Sangeeta Rani for their consistent guidance, encouragement and critical review of the manuscript starting from proposal preparation up to the final thesis written-up, without which this work would have not been become visible.

6. REFERENCES

1. Baumgartner,R. and Jackson, A, 1991, Measurement for Endurance in Physical Education. Dubuque: W.C.Brown.
2. Calabrese, K,2001.Fit and Flexibility. Retrieved, August 28, 2007, www.kellicalabrese.com
3. Cataldo, C., 1999. Nutrition and Diet Therapy: Principles and Practice, St. Paul: West Publishing Company, pp. 232-238.
4. Corbin, C.B. and R, Lindsey, 1997.Concepts of Physical Fitness. Dubuque: McGraw Hill.www.earlychildhoodnews.com/earlychildhood/article.
5. Corbin,C.B.,G.I,Welk, R.Lindsey andW.R.Corbin,2003.Concepts of Physical Fitness.Dubuque: McGraw Hill.(p.6)
6. Flegal, K.M., 2002.Prevalance and trends in obesity among U.S. adults. *JAMA.*, 288: 1723-1727.
7. Ichinohe, M and R. Mita, 2004. Physical activity, fitness and health: Obesity and lifestyle in Jamaica. *International Collaboration in Community Health*,1267: 39-50.
8. Kyle, U.G and G, Gremion, 2001. Physical activity and fat free and fat mass as measured by bioelectrical impedance in3853 adults. *Med Sci Sports Exer.*, 33: 576-584.
9. Lidell, L.1997.*The Sensual Body*. New York, Simon and Schuster, inc.
10. Lowry, R., D.A. Galuska,J.E and H. Wechsler, 2000. Physical activity, food choice and weight management goals and practices among U.Scollege students. *American Journals of Preventive Medicine*, 18: 18-19.
11. Miller, D.K,1994. Measurement by Physical Educator, Duuque, C. Brown comm. Inc
12. Mokdad, A.H, B.A, Bowman, E.S, Ford, F.Vinicor and J.S, Marks, 2001. The continuing epidemics of obesity and overweight in adults in U.S *JAMA.*, 286:1195-2000.