

UNIVERSITY OF CAPE COAST

COMPARISON OF HEALTH-RELATED PHYSICAL FITNESS LEVELS OF  
JUNIOR OFFICERS IN RURAL AND URBAN  
FIRE STATIONS IN GHANA

BY

BERNARD KORSAH

A THESIS SUBMITTED TO THE  
DEPARTMENT OF HEALTH PHYSICAL EDUCATION AND RECREATION  
OF THE FACULTY OF EDUCATION, UNIVERSITY OF CAPE COAST  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR  
THE AWARD OF MASTER OF PHILOSOPHY DEGREE  
IN PHYSICAL EDUCATION

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**DECLARATION**

**CANDIDATE'S DECLARATION**

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

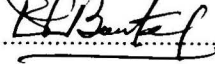
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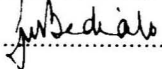
**SUPERVISORS' DECLARATION**

I hereby declare that the preparation of the thesis was supervised in accordance with the guidelines of supervision of thesis laid down by the University of Cape Coast.

Supervisor's Name: Dr. B. L. BOATENG

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Supervisor's Signature: ..... Date: 28 Sept, 2009

## **ABSTRACT**

The deteriorating health status of the modern day Ghanaian has brought in the concept of health-related physical fit-ness. This concept of health-related physical fitness has been a core component in the training of security services among which is the Ghana National Fire Service (GNFS).

The focus of this study was to find out whether there would be any significant difference in the health-related physical fitness levels of the rural and urban based junior firemen in Ghana. One hundred (100) junior firemen, fifty (50) each from the urban and rural fire stations were sampled for the study.

The Prudential Fitnessgram (2002) battery of tests was used to test the five components of health-related physical fitness of each subject for the study. The scores were analysed and compared using the independent samples t-test of the SPSS windows 12.0 programme, and the HFZ (Health Fitness Zone).

The results and findings of the study revealed that, the urban based firemen were fitter in cardio-vascular endurance than the rural group, when sub-hypothesis 1 was tested. There was no significant difference in the muscular endurance levels of the sampled rural and urban firemen, but the urban group were again found to be fitter in muscular strength than the rural based junior firemen when sub-hypothesis 2 and 3 were tested, respectively. For sub-hypotheses 4 and 5, no significant differences were revealed when flexibility and body composition were tested. As a summary, the major hypothesis revealed that the urban based firemen were slightly healthier than their rural counterparts. A lot could be ~~done~~ to improve the health-related fitness levels of firemen in the country as a whole



### **ACKNOWLEDGEMENTS**

I wish to acknowledge with gratitude my indebtedness to all the staff of the Department of Health, Physical Education and Recreation (HPER) of the University of Cape Coast for their encouragement, criticism and suggestions during the period of my study.

Sincere thanks go to Dr. B. L. Boateng of the Department of HPER, my Principal Supervisor for his corrections, suggestions and encouragement. To Mr. F. S. Bediako, also a Supervisor of mine, Dr. Ogah, and Dr. S. L. Lamptey, I say thank you for your suggestions and general contributions towards the success of this study.

**DEDICATION**

To my beloved late parents, my wife Joyce Baffour-Asare and children,  
Ignatius, Arnold and Benedicta Korsah.

## **TABLE OF CONTENTS**

	<b>Page</b>
<b>DECLARATION</b>	ii
<b>ABSTRACT</b>	iii
<b>ACKNOWLEDGEMENTS</b>	iv
<b>DEDICATION</b>	v
<b>LIST OF TABLES</b>	x
<b>CHAPTER</b>	
<b>1    INTRODUCTION</b>	<b>1</b>
Background of the Study	1
Statement of the Problem	4
Purpose of the Study	8
Research Questions	8
Major Hypothesis	9
Sub-Hypotheses	9
Significance of the Study	10
Delimitations of the Study	10
Limitations of the Study	12
Definition of Terms	12
<b>2    REVIEW OF RELATED LITERATURE</b>	<b>14</b>
Definition of Health	14
Health-Related Physical Fitness	16

	<b>Cardio-vascular Endurance</b>	<b>18</b>
	<b>Muscular Strength</b>	<b>25</b>
	<b>Muscular Endurance</b>	<b>33</b>
	<b>Flexibility</b>	<b>35</b>
	<b>Body Composition</b>	<b>42</b>
	<b>Factors affecting Health-Related Physical Fit</b>	<b>53</b>
	<b>Heredity</b>	<b>53</b>
	<b>Age</b>	<b>56</b>
	<b>Gender</b>	<b>57</b>
	<b>Race</b>	<b>58</b>
	<b>Effects of Administrative, Operational and Environmental Conditions on the Health-Related Physical Fitness of Firemen</b>	<b>58</b>
	<b>Summary</b>	<b>62</b>
<b>3</b>	<b>METHODOLOGY</b>	<b>64</b>
	<b>Research Design</b>	<b>64</b>
	<b>Population</b>	<b>65</b>
	<b>Sample and Sampling Techniques</b>	<b>65</b>
	<b>Instrumentation</b>	<b>66</b>
	<b>Validity and Reliability of Instrument</b>	<b>67</b>
	<b>Data Collection</b>	<b>73</b>
	<b>Data Analysis</b>	<b>74</b>

	<b>Cardio-vascular Endurance</b>	<b>74</b>
	<b>Muscular Endurance</b>	<b>75</b>
	<b>Muscular Strength</b>	<b>76</b>
	<b>Flexibility</b>	<b>76</b>
	<b>Body Composition</b>	<b>76</b>
<b>4</b>	<b>RESULTS AND DISCUSSION</b>	<b>79</b>
	Sub-hypothesis 1	79
	Sub-hypothesis 2	82
	Sub-hypothesis 3	86
	Sub-hypothesis 4	89
	Sub-hypothesis 5	91
<b>5</b>	<b>SUMMARY, CONCLUSION AND RECOMMENDATIONS</b>	<b>98</b>
	Summary	98
	Summary of Findings	99
	Conclusion	101
	Recommendation	101
	Suggestions for Future Research	103
	<b>REFERENCES</b>	<b>104</b>
	<b>APPENDIX A Letter of Introduction</b>	<b>113</b>
	<b>APPENDIX B Letter of Introduction (Research)</b>	<b>114</b>
	<b>APPENDIX C The Prudential Fitnessgram Test Items</b>	<b>115</b>
	<b>APPENDIX D Standards for Health Fitness Zone</b>	<b>116</b>

<b>APPENDIX E</b>	<b>Group Statistics</b>	<b>117</b>
<b>APPENDIX F</b>	<b>Independent Samples t-Test</b>	<b>118</b>

### LIST OF TABLES

Table		Page
1	Independent Samples t-test Results of Cardiovascular Endurance for Urban and Rural Firemen	79
2	HFZ Percentage Analysis of Fitnessgram Measurement of Cardio-vascular Endurance (1,600 metres run/walk Test of Subjects)	80
3	Independent Samples t-test Result of Muscular Endurance (Curl-ups) Test for Urban and Rural Firemen	83
4	HFZ Percentage Analysis of Fitnessgram Measurement of Muscular Endurance (Curl-ups) Test	84
5	Independent Samples t-test Results of Muscular Strength (push-ups) for Urban and Rural Firemen	86
6	HFZ Percentage Analysis of Measurement of Muscular Strength (Push-ups) Test	87
7	Independent Samples t-test Results of Flexibility (sit-and-reach) for Urban and Rural Firemen	89
8	HFZ Percentage Analysis of Fitnessgram Measurement of Flexibility (Sit-and-Reach) of Subjects	90
9	Independent Samples t-test Results of Urban and Rural Firemen for Body Composition ( Skin-fold)	92
10	Independent Samples t-test Result of Body Composition (BMI) for Urban and Rural Firemen	92

11	<b>HFZ Percentage Analysis of Fitnessgram Measurement of Body Fat Fat (Skin- Fold) of Subjects</b>	93
12	<b>HFZ Percentage Analysis of Fitness Measurement of BMI of Subjects</b>	94



## **CHAPTER 1**

### **INTRODUCTION**

#### **Background of the Study**

The awareness to be fit or to stay healthy in order to enjoy a meaningful life has been the concern of the government of Ghana. The teaching of physical education as well as the organization of sporting competitions among schools and colleges are all aimed at providing a variety of enjoyable physical activities for the youth to stay healthy. A healthy nation, it is believed, leads to increased production and also lowers the health cost of the government. The Ministry of Health has also been doing its best in the creation of health-related physical fitness awareness through the initiation of weekly health-walk programmes at both district and regional levels. This has become necessary, because in Ghana, participation in sporting activities is not popular with the adult population.

According to Blair and Connelly (1996), a sedentary and unfit way of life leads to high risk for several chronic diseases and premature mortality. Sedentary and unfit individuals are also more likely to develop functional limitations as they age. Moderate intensity of physical activity are associated with improved health and reduced risk of morbidity and mortality when compared with low activity. Sedentary living, the experts warn, leads to coronary artery disease and perhaps to some cancers, stroke, non-insulin dependent diabetes mellitus and other health problems. The rising physical fitness-related health problems, including obesity,

high blood pressure, heart attack, and stroke are enough to send serious signals to the government. The high sedentary lives of most of the working class and the use of machines to replace manual labour, coupled with lack of exercise in the Ghanaian society are some of the causes of present day health problems. The introduction of keep-fit clubs to help correct the situation was a good step forward, but unfortunately, it has come with some problems. Lack of qualified keep-fit trainers, performance of inappropriate activities, the usual fun involving the eating and drinking of alcoholic beverages are all not helping the keep-fit concept to be successful.

The introduction of health-walk by Professor Agyeman-Badu Akorsah, a former Director-General of the Ghana Health Services, in the year 2002, was also aimed at creating awareness of the need to exercise, and to maintain a reasonable health-related physical fitness by all citizens of the country. Professor Akorsah (2002) reiterated that maintaining satisfactory levels of health-related physical fitness can have positive impact on an individuals' health in terms of disease prevention and promotion of good health.

Boateng (2004), a former head of the Cardio-thoracic Centre, Korle-Bu Teaching Hospital, also sounded a warning when he mentioned that coronary heart diseases (CHD) were appearing at an alarming rate at the centre. Apart from the known factors like heredity, sex, and race, which may contribute to CHD, Boateng emphasized smoking, lack of exercise, obesity, sedentary life styles, and other behaviours as potentials for the promotion of CHD. According to Brunner (2005), 10 years of Mediterranean diet, physical activity, moderate alcohol intake

and not smoking were associated with lower mortality, CHD, cardiovascular disease and cancer in elderly European people.

Health-related physical fitness, is a category of physical fitness in general, just like skill-related physical fitness. Whereas skill-related or motor performance physical fitness components are related to the performance of specific functional motor tasks, health-fitness concerns the prevention and remediation of disease and illness. (Siedentop, 2001).

Insel and Roth (2001) have defined physical fitness as a set of physical attributes that allow the body to respond or adapt to the demands and stress of physical effort, that is, to perform moderate to vigorous levels of physical activity without becoming overly tired. Another definition given by Robbins, Powers, and Burgess (1997, p. 27) is that "physical fitness is the capacity of the heart, lungs, blood vessels, and muscles to function at optimal efficiency".

Physical fitness has also been defined as "the ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure-time activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well-being." (The United States President's Council on Physical Fitness and Sports [PCPFS], 2005). The PCPFS emphasized that, physical fitness is an individual quality that varies from person to person, it is influenced by age, sex, heredity, personal habits, exercise, and eating practices.

Apart from the above, Hahn, and Wayne (2003) have also said that physical fitness is achieved when “the various systems of the body are healthy and function effectively so as to enable the fit person to engage in activities of daily living, as well as in recreational pursuits and leisure activities without unreasonable fatigue.” All the above definitions emphasize on the positive and optimal organic function with efficiency in relation to the task ahead. Health-related physical fitness concerns itself with cardio-vascular or circulo-respiratory endurance, muscular strength, muscular endurance, joint flexibility and body composition. The importance of health-related physical fitness to the performance of physical tasks, especially, has made it a major component of the training of security services in the world. In Ghana, mention could be made of the Armed forces, Police service, Fire service, and others, as organizations which put more emphasis on health-related physical fitness during their training programmes due to the nature of their jobs.

Apart from personnel of the armed forces, the personnel of other previously named security services seem to care less about maintaining their physical fitness levels after graduating or passing-out from their respective training schools and academies. Contemporary servicemen and women who are expected to look smart and fit enough to accomplish their strength and endurance demanding tasks of maintaining peace and saving lives and properties, are gradually becoming obese, and becoming weaker at their various stations.

#### **Statement of the Problem**

It has been observed that the high general physical fitness levels of recruit

firemen at the training school start falling after passing-out and are posted to their stations. Comparatively, the urban firemen seem to be physically fitter and of good health throughout their working life, and even during retirement, than the rural firemen.

In the urban areas fire stations have adequate space for training purposes. Station routine orders in the form of foot-drills, hose-drills, sports and games are often carried out. The frequent occurrence of fire and rescue related situations in urban areas are expected to keep the firemen active and physically fit.

Unlike in the urban areas, the fire stations in the rural areas are not standard, and as such, most lack basic facilities and areas for recreational activities and fire drills. Most of the rural fire stations were created during the early 1980's when the nation was faced with rampant bushfires. The G.N.F.S, under pressure during that time, was compelled to turn cocoa sheds and residential premises into fire stations. The lack of space and the residential environment in which these rural fire stations were located did not allow for much physical exercise and drills to promote good physical health for the rural fireman. Some of these stations were usually attached to the district assembly premises, and, therefore, lacked the freedom and peaceful environment to train and maintain their physical fitness levels.

It is interesting to note that, the rural areas provide their own kind of incentives for the workers there. The availability of cheap food, meat, strong local gin and relatively low cost of living are necessary evils which are easily abused, and may affect health-related physical fitness of the men. A visit to the rural towns

will let you realize that, food is abundant but their diet is not balanced. Large quantities of starchy foods are eaten with very little amounts of proteins, vitamins, fats, and mineral salts. Large bowls of fufu are eaten with little soup and just a piece of smoked fish. Fruits produced in villages are sold and are hardly eaten. It is interesting to note that firemen posted to towns are influenced by the immediate environment and lifestyle, so they tend to follow the rural feeding style which in the long-run may affect their general health.

Lack of good entertainment facilities in the towns, unlike the cities, is also a big problem to the fireman posted to work there. After duty, the young fireman would have no where to go or nothing interesting to engage himself in for leisure. The only attractive place to go is the drinking bar. The effects of the over-use of these locally brewed strong liquors, which are sometimes not well brewed may go a long way to affect the health-related physical fitness levels of the rural fireman. Alcohol often affects the cardiovascular system by increasing the heart rate and blood pressure, dilates the blood vessels near the skin, irritates the lining of the stomach, causes cirrhosis of the liver, gout, cancer of the throat and mouth, epilepsy, impotence, and others. (Jones, 1997). Health experts have stated that "intoxicants destroy both physical and mental health" (Bhaktipada, 1998, p.88).

Apart from drinking, the next available cheap source of entertainment are the local women who easily fall in love with these young servicemen posted to the towns which have most of their men drifting to the cities and traveling abroad for greener pastures. The over-indulgence in sex as a means of entertainment could affect the health-related physical fitness levels of some firemen, apart from the

sexually transmitted diseases which are also a serious health problem. According to Bhaktipada, (1998, p.10), "frivolous use of sexual energy drains the physical and mental systems, and the more this energy is wasted, the more life is spoiled. Pythagoras, has also been quoted in the book "Joy of No Sex" by Bhaktipada, (1998) as telling his students to be sober and chaste, because sex is always harmful and not conducive to health. Sexual intercourse involves the destruction of our bodies, leading to the shortening of life. During orgasm, both mental and physical energy are lost, much more than in any forms of sense indulgence. Freud has also been quoted in the same book by Bhaktipada to have said that "the greatest pleasure in the material world is sex. The price of this pleasure, however, is a higher one, for at orgasm the entire system is drained" (1998, p.12).

The lack of available opportunities for the rural fireman to spend his leisure time happily, forces most of them into serious farming which involves a lot of energy expenditure. These firemen usually fall sick and become physically weak due to poor feeding which does not replenish the expended energy.

Apart from bore-holes, most towns depend on wells, harvested rain-water, rivers and streams for water. The poor surroundings and unhygienic receptacles used in fetching water from the above named sources usually contaminate the water which cause various water-borne diseases of which the rural firemen are easily affected. The lack of good health-care facilities does not allow the sick fireman to have the best treatment.

The poor roads in most towns, which are full of pot-holes and dust are another serious health concern to talk about. The frequent use of bad roads, it is known,

affects the shock-absorbers and springs of cars and, therefore, puts the health of the passengers at risk. Most of the grounded fire tenders in Ghana are due to bad roads and resulting accidents which have caused loss of lives and permanent physical deformities to some firemen of which a larger percentage comes from the rural areas. Records have also revealed that, personnel who die in active service due to poor health are mostly from the rural areas, or have spent most of their working lives in the rural area (G.N.F.S., 2006).

Problems associated with impregnating an unmarried woman, lack of promotion, and opportunities to improve academic standards, low and poor standards of living, and lifestyles compared to colleagues in the cities, boredom of over-stay in rural fire stations without transfer, inhalation of toxic gases during bush-fire fighting are all issues which may have contributed to the fall in the health-related physical fitness levels and the poor general health status of the rural firemen.

#### **Purpose of the Study**

The different conditions existing among the various fire stations could influence health-related physical fitness levels of the junior fireman working in the rural and urban stations of the country.

The purpose of the study was to find answers to the following questions:-

#### **Research Questions**

1. What is the difference in the health-related physical fitness status between the junior firemen in rural and urban fire stations?



2. What is the difference in the cardio-vascular endurance fitness status between the junior firemen in rural and urban fire stations?
3. What is the difference in muscular endurance fitness status between the junior firemen in rural and urban fire stations?
4. What is the difference in muscular strength fitness status between junior firemen in rural and urban fire stations?
5. What is the difference in flexibility fitness status between the junior firemen in rural and urban fire stations?
6. What is the difference in body composition fitness status between the Junior firemen in rural and urban fire stations?

#### **Major Hypothesis**

There is a significant difference between the health-related physical fitness levels of junior firemen stationed in rural and urban, with the urban stationed, having a higher fitness status.

#### **Sub-Hypotheses**

1. There is a significant difference between the cardio-vascular endurance fitness levels of rural and urban stationed junior firemen, with the urban stationed having higher fitness status.
2. There is a significant difference between the muscular endurance fitness levels of rural and urban stationed junior firemen, with the urban stationed having a higher fitness status.
3. There is a significant difference between the muscular strength fitness levels of rural and urban stationed junior firemen, with the urban stationed

- having a higher fitness status.
- 4 There is a significant difference between the flexibility fitness levels of rural and urban stationed junior firemen, with the rural stationed having a higher fitness status.
  5. There is a significant difference between the body composition fitness levels of rural and urban stationed junior firemen, with the rural stationed having a higher fitness status.

#### **Significance of the Study**

The findings of the study will serve as a foundation for further research into health-related physical fitness issues of personnel of security services and the general public. It would add new knowledge to this area of research that other researchers have already delved into. The findings of this study will also be food for thought for the management of G.N.F.S. and will sensitize them to review administrative and training policies for the improvement of the health-related physical fitness levels of the men in the service. The test scores will also be useful to participants of the study and their colleagues since it will motivate them to undertake individualized or group health-related physical fitness programmes.

#### **Delimitations of the Study**

The study was delimited to the health-related physical fitness levels of the junior firemen who are of the ages of 18 and 20 years selected from urban and rural fire stations of two selected regions, as follows:-

##### **Rural Fire Stations**

1. Nkoranza fire station
2. Breman Asikuma fire station.

#### **Urban Fire Stations**

1. Cape Coast fire station.
2. Techiman fire station

The data collection was delimited to five variables which were the components of the health-related physical fitness. The variables were cardio-vascular endurance, muscular endurance, muscular strength, flexibility, and body composition. The instrument that was used to measure the health-related physical fitness levels between the sampled junior firemen was the Prudential Fitnessgram (2002); from which the one-mile (1,600m) run/walk test was used to measure cardio-vascular endurance, push-ups was used to test upper body strength, while curl-ups and back-saver sit-and-reach on the Acuflex box tests were used to measure abdominal muscles endurance, and back flexibility, respectively. A pre-calibrated pair of skin-fold calipers was used to measure skin-folds of the chest, abdomen, and thigh. All measurements were taken at the right side of the body with the subjects standing. The Prudential Fitnessgram (2002) test norms were used for the interpretation of the test results.

As already mentioned in the statement of the problem, only administrative, operational and environmental factors were considered as the basis of the differences in the health-related physical fitness levels of the junior firemen in the sampled rural and urban fire stations.

### **Limitations of the Study**

The absence of a reliable locally developed instrument for physical fitness testing led to the dependence on the Prudential Fitnessgram (2002), developed in the United States of America, where the subjects are of a different race, ethnicity and environment from the subjects of this research.

The use of the BMI to compare the body composition of participants may affect the results and the interpretation of the findings, since it has the problem of differentiating between fat and muscle. The problem of classifying huge and muscular sampled members as obese may arise.

### **Definition of Terms**

#### **Firemen**

The male personnel of the Ghana National Fire Service (G.N.F.S.).

#### **Junior Offices of G.N.F.S.**

All personnel of G.N.F.S. having the rank of Recruit Fireman to Station Officer.

#### **Rural**

Local government area with the administrative status of a District

#### **Rural Firemen**

Fire Service personnel stationed in a local government area with the administrative status of a District

#### **Rural Fire Station**

Fire station located in a community with the administrative status of a District.

**Urban**

Local government area with the administrative status of Municipal or Metropolitan/City.

**Urban Firemen**

Fire Service personnel working in a local government area with the administrative status of Municipal or Metropolitan / City.

**Urban Fire Station**

Fire Station located in an area with the administrative status of Municipal or Metropolitan / City.

## **CHAPTER 2**

### **REVIEW OF RELATED LITERATURE**

This chapter dealt with the review of related literature for the study, and focused on the following sub-headings:-

- i. Definition of Health ,
- ii Health-Related Physical Fitness,
- iii. Components and measurement of Health-Related Physical Fitness,
  - a. Cardio-vascular Endurance
  - b. Muscular Strength
  - c. Muscular Endurance
  - d. Flexibility
  - e. Body Composition
- iv. Development of Health-Related Physical Fitness,
- v. Factors affecting Health-Related Physical Fitness,
- vi Influence of Administrative, Operational and Environmental conditions on the Health-Related Fitness of firemen.
- vii. Summary

#### **Definition of Health**

Most people think they are healthy, just because they are not sick. Not being sick is not a good indicator of being healthy. The World Health Organisation (WHO) has defined health as “a state of complete physical, mental and social

wellbeing and not merely the absence of disease or infirmity" (Schriver, Powers Lawrence and Vorhaus, 1996).

Health is also seen as optimal well-being that contributes to quality of life. It is more than freedom from disease and illness, though freedom from disease is important to good health. Optimal health is said to include high-level mental, social, emotional, spiritual and physical wellness within the limits of one's heredity and personal abilities. (Corbin and Lindsey, 1997). From the above definitions, it is clear that the absence of disease is not an indication of being healthy. To be healthy, a person should not only be physically fit, but emotionally, mentally sound, as well as socially acceptable. A physically well built person with a lot of problems to think about or under stress, could not be a healthy person. To be healthy, a person should have all three components of health as indicated by the definition of WHO. The absence of one factor does not make a person healthy.

According to Hahn, et al. (2003, p. 10), "Health is the ability to access and apply resources from the six dimensions of health to the experiences of daily living, thus assuring growth and development and the sense of well-being that it affords". The six dimensions of health are physical, emotional, social, intellectual, spiritual and occupational dimensions. This definition, like the first ones, does not mention the absence of disease as an indication of being healthy, but confirms the fact that health is a composite situation. It also indicates that health is not static, it could change in the next moment, positively or negatively.

Naturally, it is considered that health among people vary greatly with income, gender, age, and family origin. Rich people are seen as healthier than

poor or low income earners, because with higher incomes people could engage themselves in active recreational and leisure time physical activities like golf, tennis, aerobic dancing and others to improve their physical, emotional-mental, social and spiritual health. Women are also likely to be classified as fair or poor in health. In our homes, older adults usually report of poor health than the youth. It should not be a surprise to know that African Americans and Hispanics are often classified as poor in health than white non-Hispanic(Corbin, Welk, Lindsey, and Corbin, 2003).

In modern times wellness is seen as the positive component of optimal health. Diseases, illness and debilitating conditions are negative components that detract from optimal health. Wellness has been recognized as the positive component of optimal health as evidenced by a sense of well-being reflected in optimal functioning, a good quality of life, meaningful work and a contribution to society. Wellness is seen as the vehicle by which one's potential to live and work effectively and to make a significant contribution to society could be expanded (Fahey, Insel, and Roth, 2003).

#### **Health-Related Physical Fitness**

Physical fitness is defined by Corbin et al. (2003) as "the body's ability to function effectively and efficiently, enjoy leisure time, be healthy, resist hypokinetic diseases and meet emergency situations" (p. 6). They went further to explain that physical fitness is a state of being that consists of at least five health-related and six skill-related components, each of which contributes to total quality of life. It is related to, but different from health and wellness



Another definition given to physical fitness is, "a set of physical attributes that allow the body to respond or adapt to the demands and stresses of physical effort, that is, to perform moderate to vigorous levels of physical activity without becoming overly tired" (Insel et al., 2001, p.361). Robbins et al. (1997) define physical fitness as the capacity of the heart, lungs, blood vessels and muscles to function at optimal efficiency. According to Hahn et al (2003) physical fitness is achieved when "the various systems of the body are healthy and function effectively so as to enable the fit person to engage in activities without unreasonable fatigue" (p.64).

Physical fitness also means that the various systems of the body are healthy and function effectively so as to enable the fit person to engage in activities of daily living, as well as recreational pursuits and leisure activities, without unreasonable fatigue. The road to physical fitness includes proper medical care, the right kinds of food in the right amounts, good oral hygiene, appropriate physical activity that is adapted to individual needs and physical limitations, satisfying that, is adapted to individual needs and proper amount of rest and relaxation, since physical fitness affects the total person's intellect, emotional stability and physical conditioning (Prentice, 1997).

Apart from the above, physical fitness has been defined as the ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure-time activities and meeting emergency demands. It is the ability to endure, to bear up to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well-being. It is

important to note that physical fitness is an individual quality that varies from person to person, and it is influenced by age, sex, heredity, personal habits, exercise and eating practice. Unfortunately, nothing can be done about the first three factors, however, an individual can improve the state of the others when needed (PCPFS, 2005). Proper nutrition is important to physical fitness, because energy expenditure depends on nutrition. If diet is inadequate, the fitness level will drop. Overweight, underweight and weak individuals will have below average strength fitness levels (Ulrich, 2006). All the above definitions emphasize on the positive and optimal organic function with efficiency in relation to the tasks ahead. Health-related fitness concerns itself with cardio-vascular or cardio-respiratory endurance, muscular strength, joint flexibility and body composition.

The importance of physical fitness has been highlighted by Wessel and Arant (2004), with the statement that, physical fitness and activity reduces the risk of coronary artery diseases (CAD) in women with suspected ischaemia. According to Weuve, King and Maison (2004), regular physical activity over a period of a year is associated with improved cognitive function and reduced cognitive decline in older women.

From the above discussion, one is confident to say that physical fitness or health-related fitness is just a component of the total health concept. A person with a very high level of health related fitness should not think that he or she is automatically healthy.

#### **Cardiovascular Endurance**

Cardiovascular endurance is considered as the most important aspect of

health-related fitness due to its importance in decreasing risk of heart disease, and promotion of optimum performance. Other names given to cardiovascular endurance are cardio-respiratory fitness, cardio-respiratory endurance, cardiovascular fitness or aerobic fitness. The name cardio-respiratory fitness is given because it requires the delivery and utilization of oxygen, which is only possible if the circulatory and respiratory systems are capable to perform these functions. The term "aerobic fitness" has been in use, because aerobic capacity is considered to be the best indicator of cardio-vascular fitness, and aerobic physical activities are the only means to achieve it (Corbin et al., 2003). Cardio-vascular endurance, according to Wuest and Lombardo (1994), is often referred to as cardio-respiratory endurance. It is the entire body's ability to exercise vigorously for extended periods of time without undue fatigue.

Robbins et al. (1997) state that "cardio-respiratory endurance is the ability to deliver essential nutrients, especially oxygen to the working muscles of the body, and to remove waste products during prolonged physical exertion" (p. 27). They go on to say, that exercise reduces coronary heart disease risk, but that does not mean that when you exercise you will not have heart attack. Genetic and other lifestyle factors are involved.

Cardio-respiratory endurance, according to Insel et al. (2001), depends on the ability of the lungs to deliver oxygen from the environment to the bloodstream, the hearts capacity to pump blood, ability of the nervous system and blood vessels to regulate blood flow, the muscles capacity to generate power and capability of the body's chemical systems to use oxygen and process fuels for exercise. They

**APPENDIX F**  
Independent Samples t-Test

	Levene's Test for Equality of Variances			t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
body mass index	.048	.827		1.262	98	.210	76800	60880	-43976	197576
				1.262	97.942	.210	76800	60880	-43976	197576
Stem fold	1.21	.28		.807	98	.422	-60400	74874	2 06988	88186
				.807	97.998	.422	-60400	74874	-2 06988	88186
press ups	6.308	.014		2.151	98	.034	3 50000	1 62891	27145	6 72855
				2.151	83.030	.034	3 50000	1 62891	27145	6 72855
cut - ups	105	.747		.687	98	.508	1 78000	2 68718	-3 51293	7 07293
				.687	93.711	.508	1 78000	2 68718	-3 51293	7 07293
at - and - reach	1.587	.214		.172	98	.683	-22240	1 28995	-2 78225	2 33745
				.172	92.809	.683	-22240	1 28995	-2 78225	2 33745
cardio vascular endurance	.000	.999		3.146	98	.002	5 92240	2 188280	2 18804	9 65878
				3.146	97.916	.002	5 92240	2 188280	2 18800	9 65878

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