


A SURVEY OF PHYSICAL ACTIVITY PATTERNS AND LEVELS IN THE HOHOE DISTRICT

BY

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The logo of the University of Ghana is a watermark in the background. It features a shield with three golden leaves at the top, a central golden emblem, and two golden scrolls at the bottom. The shield is set against a light blue background.

SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF GHANA, LEGON

**A DISSERTATION PRESENTED TO THE UNIVERSITY OF
GHANA IN PARTIAL FULFILMENT FOR THE AWARD OF
MASTER OF PUBLIC HEALTH**

AUGUST, 2004

DECLARATION

This dissertation is based on my own independent work apart from the references, suggestions and contributions, which have been duly acknowledged. I further declare that this work has neither been accepted in any form for any other degree nor concurrently been submitted in candidature for any other degree.



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DEDICATION

I dedicate this work to all those who are pioneering the advocacy for recognition of physical activity as an important component of public health in Ghana.



ACKNOWLEDGEMENT

To God be the Glory! This work has been accomplished through the support and scrutiny of my academic supervisors, Dr Eric Amuah and Professor Isabella Quakyi, who is also the Director of the School of Public Health of the University of Ghana. I shall forever be grateful to them for their constructive criticisms and comments and also my field supervisor Dr S. K. Atimpo (District Director of Health Services) and Dr Awadzi, Director, Onchocerciasis Chemotherapy Research Centre (OCRC) for their extensive assistance, guidance and support on the field.

I appreciate the tremendous encouragement and gracious support I received from senior members especially Professor Ebenezer Laing, and staff of the School of Public Health.

My research assistants, especially Mr. Richard Tofa, staff of the District Health Directorate, District hospital, OCRC, and other allied agencies in the Hohoe district also played no mean role in ensuring the success of this project.

The Ministry of Health and the Ghana Health Service were my proud sponsors and my sincere thanks go the Minister and the Director-General as well as staff of the two institutions

Finally, I take this opportunity to thank my wife Ama, family; colleagues and friends for their support and contribution towards this dissertation.

DEFINITION OF TERMS

The following lists terms that are commonly used in discussions of exercise and physical activity.

Calorie

A measure of energy from food. Also the amount of heat required to raise the temperature of 1 gram of water 1°C (1000 calories = kilocalorie). An interesting fact: when we see “Calories” on a food label it is actually measuring kilocalories, although the prefix “-kilo” is dropped and the “c” is capitalized – “Calories”.

Cardiorespiratory fitness

Cardiorespiratory fitness is the ability of the body’s circulatory and respiratory systems to supply fuel during sustained physical activity.

Exercise

Exercise is physical activity that is planned or structured. It involves repetitive bodily movement done to improve or maintain one or more of the components of physical fitness – cardiorespiratory fitness, muscular strength, muscular endurance, flexibility, and body composition.

Household physical activity

Includes activities such as sweeping floors, scrubbing, washing windows, raking the lawn, etc.

Inactivity

Not engaging in any regular pattern of physical activity beyond daily functions

Kilocalorie

The amount of heat required to raise the temperature of 1 kg of water 1°C. Kilocalorie is the ordinary calorie discussed in food or exercise energy-expenditure tables and food labels.

Leisure-time physical activity

Leisure-time physical activity is physical activity that is performed during exercise, recreation, or any additional time other than that associated with one's regular job duties, occupation, or transportation.

Moderate-intensity physical activity

Moderate-intensity physical activity generally requires sustained rhythmic movements and refers to a level of effort equivalent to

- a “perceived exertion” of 11 to 14 on the Borg scale
- 3 to 6 metabolic equivalents (METs);
- any activity that burns 3.5 to 7 Calories per minute (kcal/min); or

- the effort a healthy individual might expend while walking briskly, mowing the lawn, dancing, swimming, or bicycling on level terrain, for example.

A person should feel some exertion but should be able to carry on a conversation comfortably during the activity.

Occupational physical activity

Occupational physical activity is completed regularly as part of one's job. It includes activities such as hauling, lifting, pushing, carpentry, shovelling, packing boxes, etc.

Physical activity

Physical activity is any bodily movement produced by skeletal muscles that results in an expenditure of energy.

Physical fitness

Physical fitness is a measure of a person's ability to perform physical activities that require endurance, strength, or flexibility and is determined by a combination of regular activity and genetically inherited ability.

Regular Physical activity

A pattern of physical activity is regular if activities are performed

- most days of the week, preferably daily;
- 5 or more days of the week if moderate-intensity activities are chosen; or

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ABSTRACT

Physical Activity, a core component of wellness promotion, does not command intense research interest in Africa in general and Ghana in particular. Data on physical activity prevalence in Ghana is lacking despite the apparent knowledge, belief, attitude and practices on its potential benefits. Physical activity promotion seems to be the least of the priorities of public health surveillance interventions in Ghana. This cross-sectional, exploratory academic enquiry sought to determine the physical activity patterns and levels in the Hohoe District, a predominantly farming area with quasi-urban tendencies. The demographic characteristics seem to suggest a rather 'highly active'; (70% of economic activities is dedicated to agriculture which is heavily labour-dependent but hardly technologically modern), youthful, low vehicle/population ratio but significantly high prevalence of hypertension, the second highest cause of morbidity (8%) after malaria in the district. Interactive web collaboration, literature review on physical activity and the use of the International Physical Activity Questionnaire (IPAQ), a self-administered instrument, typified the methodology applied as both qualitative and quantitative research within the interpretative science paradigm. Two hundred and eleven residents of Hohoe were questioned about their physical activities across four domains: Incidental, transportation-related, occupational and leisure-time physical activity. Specifically, they were asked about the intensity: walking (3.3 METs) moderate physical activity (4.0 Mets) vigorous physical activity (8.0 METs) in the last seven days; in each case the time spent in minutes (duration and number of sessions per week (frequency). Based on the assertion that health benefits are dependent on a minimum level of physical activity (intensity x duration x frequency) of

600MET-min/week, the respondents were categorized accordingly as being 'Inactive', 'Minimally active' and 'HEPA active' (Health Enhancing Physical Activity). The findings indicated a generally highly (HEPA) active population (47.1%) with less female proportion; insufficiently active (inactive) higher socio-economic group and much less leisure-time physical activity (LTPA), across a wide socio-economic, occupational, age and gender strata. The Keep Fit Clubs provided most respondents, particularly the higher socio-economic group with leisure-time physical activity. The high rate of cardiovascular diseases among the higher socio-economic, insufficiently active and female groups is consistent with findings in the literature and further debunked the previously held notion that health benefits were only derived from leisure-time physical activity. Among the school going-age group physical education (PE) provided the main opportunity in 'leisure-time' physical activity, the result of lack of recreational facilities in the district. A physical activity intervention surveillance study in the district will help further to elucidate the high prevalence of hypertension and other emerging preventable, communicable and non-communicable diseases. Furthermore, any policy initiative on physical activity by the Ministry of Health must recognize, improve and sustain the Keep Fit concept as a community-based organization and a valuable partner of public health. The Ghana Health Service on its part must publish as a matter of urgency a document providing guidelines on physical activity for health care providers and the general public.

CHAPTER ONE

1.0 INTRODUCTION AND BACKGROUND

“A sound mind in a sound body”, an oft-repeated adage appears lost when addressing typical public health issues in our part of the world. Public health in Ghana ignores the importance of physical activity, and its promotion is limited to ‘once –an- holiday slogan’ chanting.

Evidence is growing that simply becoming more physically active may be the single most important lifestyle change for promoting health and well-being.

“It is generally believed that physical activity and fitness offer important health benefits. And, just as important, we recognise the fact that sports and participating in sport activities help individuals develop character, discipline, confidence, self esteem, and a sense of well being” - noted the President’s Council on Physical Fitness and Sports (PCPFS) of the USA - a statement that is in consonance with the globally functional definition of Health.

The WHO World Health Report 2002 shows that chronic diseases are an important factor in the burden of disease in developing as well as developed countries. Among low and middle income countries 79% of deaths and 85% of the burden were due to heart disease, stroke, cancer, diabetes, and respiratory disease. Participation in physical activity has an independent, causal, and protective effect against heart disease, stroke, type 2 diabetes mellitus, colon cancer and breast cancer. The global influence of



increasing urbanisation, changes in transportation, work, and leisure-time practices has led to reductions in physical activity in many parts of the world ¹. With the ever-improving socio-economic status, technology, transportation, housing and urbanisation, more Ghanaians are suffering from such chronic non-communicable diseases (NCD) as cardiovascular diseases, diabetes and cancers. Again, residential, office, industrial and urban or community development do not consider the ergonomics of physical activity.

Regular physical activity helps prevent obesity, heart disease, hypertension, diabetes, colon cancer, and premature mortality ².

In developing countries in sub-Saharan Africa, communicable diseases still predominate ³ but there is limited evidence that suggests that non-communicable disease already present a substantial burden⁴. The burden of NCDs projected for developing countries from the current trends in the global pattern indicates an increase from 27% to 43% from 1990 to 2020 (WHO, Evidence Information and Policy, 2000).

With this overwhelming evidence that physical activity plays an important role in preventing coronary heart disease (CHD) and cardiovascular diseases (CVD) general. ²⁷⁻²⁹ the Ghana Health Service has recently generated quite an enormous interest in 'regular exercises'. However this needs to be developed into a more comprehensive blue print with guidelines for all health personnel as well as those who provide similar services.

Previous guidelines for appropriate physical activity to increase cardiorespiratory fitness included participating in vigorous-intensity activity (i.e., >20 minutes per day, >3 days per week) ⁵. CDC and the American College of Sports Medicine concluded that health-related benefits could accrue from a minimum of 30 minutes of moderate-intensity activity on most days of the week⁶. Various household and transportation-related physical activities and some leisure-time activities, therefore, can be important to measure ⁷.

The thought of leisure-time physical activity being the only realistic domain in health promotion makes it a rather sophisticated, elitist and expensive alternative to the otherwise readily demonstrable domains that have been known to exist but 'refused' recognition and 'denied' accessibility to research.

Prescribing the precise 'amount' of physical activity that is of benefit to the individual is still a hazy area and many attempts have been made to measure these 'quantities'. One such outcome is the instrument used extensively in this study; the International Physical Activity Questionnaire (IPAQ), and the background knowledge provided by the American College of Sports Medicine, and the Centres for Disease Control and Prevention in Atlanta, Georgia.

1.1 OVERVIEW OF PHYSICAL ACTIVITY IN GHANA

Whereas Public Health problems in a developing country like Ghana are more of communicable diseases than the lifestyle chronic diseases like hypertension and diabetes, the opposite is the case in the developed world. However there is a strong urge by the public to take such measures as to promote healthy living. Thus in the past

20 years or so, several Fitness Clubs or ‘Keep Fit’ Clubs (KFC) as they are known in Ghana have emerged. These Clubs have as their main objective, encouraging physical activity as a means of promoting healthy living.

Currently there are about 279 ‘Keep Fit’ Clubs— (Table 1.1) and 47 trained physical instructors registered by the Mass Sports Association of the National Sports Council of Ghana, the administrative arm of all KFCS, although there is no regulatory body¹⁵.

Table 1.1 DISTRIBUTION OF KEEP FIT CLUBS BY REGION

REGION	NO. OF CLUBS
GREATER ACCRA	127
ASHANTI	56
EASTERN	18
VOLTA	26
WESTERN	6
CENTRAL	6
UPPER WEST	4
UPPER EAST	6
NORTH	6
BRONG AHAFO	24
	279

SOURCE: National Sports Council of GHANA

They operate mainly in the urban centres and are more akin to the Ministry of Youth, Education and Sports, than the Ministry of Health. Their activities appear pointed to physical fitness than health, though one may argue that physical fitness underpins

health. Most of these clubs are community– based organisations and membership is usually open to both sexes with no age limit and spans a wide socio-economic strata. Their programmes include weekly physical activities, occasional talk or lecture on healthy living and health screening by health personnel. Other activities may be recreational, leisure or social based.

Even though there is available in Ghana health services for non-communicable diseases (NCDs) emerging diseases, public health programmes in Ghana fail to address these concerns. For example, physical activity is a well-known key factor in the prevention of complications of type II diabetes¹; however, physical activity hardly features in the Public Health programmes targeted at such patients and the population at risk. Again, the commitment in terms of allocating resources towards the physical activity programmes is grossly inadequate at best, or virtually non-existent.

While examining all these-benefits of physical activity, it is also important to find out whether those who seek expert advice or enrol in exercise programmes derive the appropriate benefits and do not risk further deterioration in health or even end up being morbid.

From the foregoing there is the need to examine critically, the spontaneity of participation that fitness clubs provide in health promotion activities. It is also important to recognise the community orientation of the ‘Keep Fit’ club concept and accord it the needed support in public health programmes. They probably provide

one of the best instruments for change in tackling lifestyle diseases and in fact preventable communicable and non-communicable diseases if the benefits of physical activity are well appreciated.

The 'Keep Fit' concept in Ghana is an idea mooted to practice some aspects of the principles of wellness, an expanded view of the meaning of health. The impact of Keep Fit clubs on health promotion, the programmes and activities they pursue, the training or background of the personnel they employ as well as the equipment they provide all demand answers if they are to be recognized as capable of providing a new partnership in public health.

The uncontrolled and unregulated activities of the Keep Fit clubs could also pose a threat to the very idea they seem to promote. This is so because their programmes fall in the domain of leisure-time activity, which historically, has been the most researched and prescribed form of physical activity for health promotion.

As most of the KFCs depend on members' subscription to run its programmes, they fall short of meeting the needs of those who desire to utilise the services they provide mainly because of economic considerations.

At the end of the study it is hoped that a reasonable level of information on physical activity patterns in the district will provide the needed impetus for interventional surveillance studies for some of the health problems that have benefited from similar studies elsewhere.

1.2 THE PROBLEM

Low levels of cardiorespiratory fitness are linked with heart disease, the second leading cause of morbidity and mortality, and the most significant non-communicable disease among the adult population in the Hohoe district³⁰

Public Health programmes in Ghana do not feature physical activity as one of the core components in the prevention of non-communicable diseases. And physical activity is confined to the narrow spectrum of leisure-time physical activity which cannot be fully practised by most busy and poor people. Information on the benefits and potential benefits of physical activity is either scanty or unavailable in most health installations in the country and to the general public.

The socio-cultural orientation of the predominantly rural Hohoe district, as in the greater part of Ghana, makes such a study an important academic exercise to elucidate the potential benefits of the wider concept of physical activity as against the oft-adopted Leisure-Time Physical Activity.

1.3 JUSTIFICATION FOR THE STUDY

Data on physical activity in Ghana are unavailable, and informed decisions as well as policy direction to tap its well known benefits do not exist.

Interventional activities in some NCDs of significance in the district and elsewhere in the country do not include physical activity.

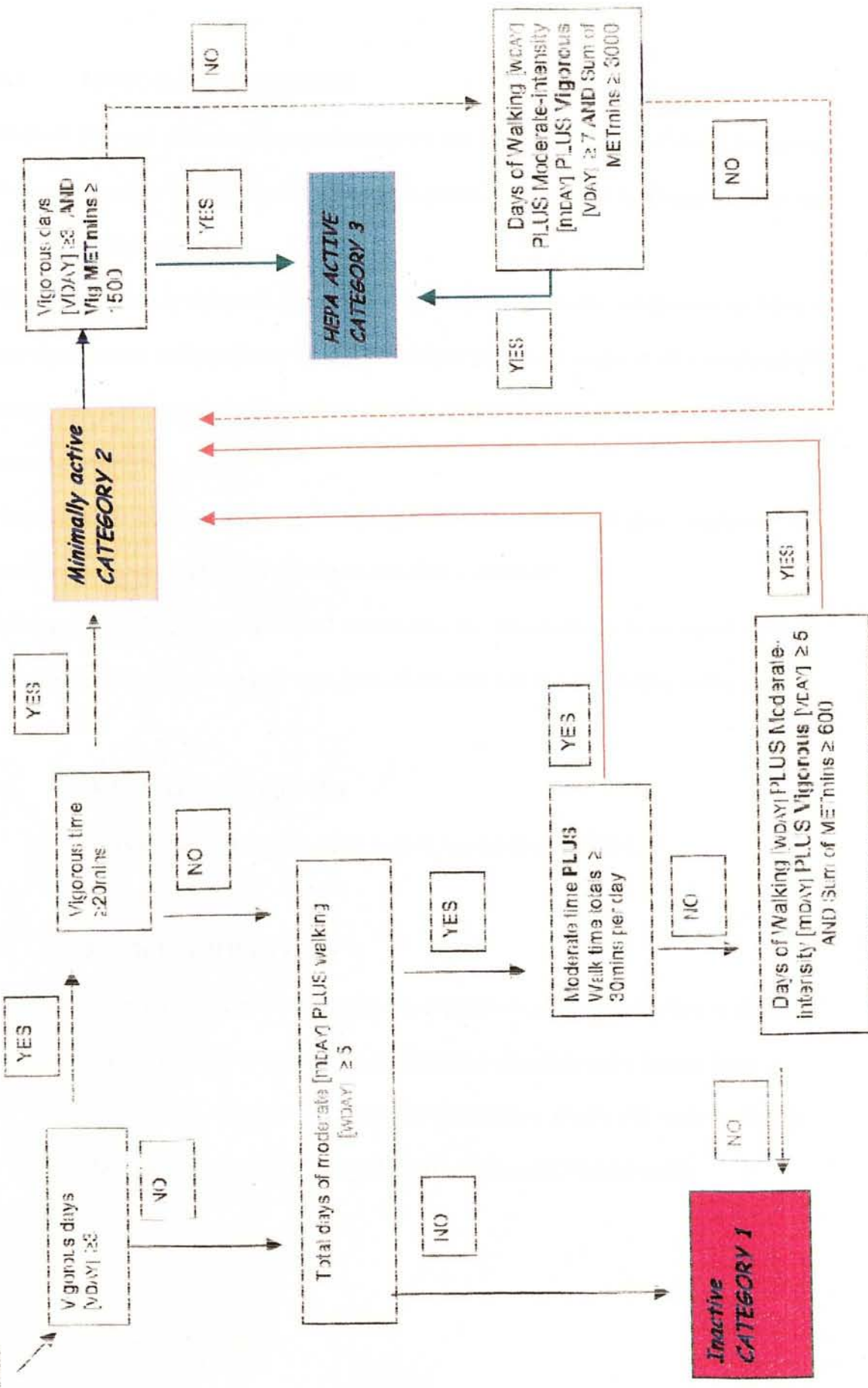
Prescribers occasionally mention 'exercise' for such conditions as CVD, diabetes, obesity etc without being specific about the intensity, frequency and duration as they would do in applying medications.

In studies done elsewhere, the emphasis had been placed on LTPA to the exclusion of the other domains of physical activity like domestic or incidental, transportation and occupational or work-related.

The new database generated will form the basis for further research into the role of physical activity in the distribution of disease (and wellness!) in the district. The findings and conclusion drawn from the study will hopefully provide some explanation for the high prevalence of some non-communicable diseases, with the recommendations to help address some of them.



START HERE



1.5 RESEARCH QUESTIONS

Regular physical activity or exercise is good for health and thus promotes wellness. But how much of it? (intensity), how long? (duration), how often? (frequency) do we need this to be healthy?

We may proceed to ask what type of physical activity (domain), where (accessibility), and at what cost (affordability) for the individual? If it is necessary at all to undergo all these and we appear to be aware of the benefits, who informs, educates and communicates these to us?

How does the socio-cultural, economic, gender and educational status influence the pattern and levels of physical activity in the Hohoe district?

What proportion of the population undertakes the minimum recommended level of physical activity commensurate with potential health benefits at the time of the study?

1.6 GENERAL OBJECTIVES

- To create database on Physical Activity in the Hohoe District.

1.7 SPECIFIC OBJECTIVES

- To determine the patterns and levels of physical activity in the Hohoe district
- To describe the commonest physical activity domains in the Hohoe District
- To determine whether the sampled population meets the criteria for the recommended physical activity to derive the needed health benefit

- To recommend subsequent physical activity intervention surveillance studies on the commonest diseases in the district with emphasis on preventable non-communicable diseases.

1.8 PROFILE OF THE STUDY AREA

Location of Hohoe District

The District is one of the twelve districts in the Volta Region. It is located in the central part of the region. It is bounded on the North by Jasikan district, South by Ho district, East by the Republic of Togo and West by Kpandu District.

Area

The district covers an area of 1172 sq km, consisting of 126 communities. The district has been divided into 6 health zones known as Sub-districts. These are: Akpafu, Alavanyo, Gbledi, Likpe and Leklebi sub-districts.

Population

The projected population for 2003 was 161,937. The population growth rate is 2.7%. The population density is about 100 inhabitants per square kilometre. The main economic activities are: farming (55%), trading (25%), livestock rearing (15%) and others (5%). There is no available data on physical activity as a health programme and registered fitness clubs are very few (2) indeed.

Topography

It is a mountainous area to the East on the border with Togo. The highest mountain in Ghana, mount Afadjato is found in the district.

Rivers

The main rivers are;

1. Dayi
2. Koloenu.

There are also the Wli waterfalls and the Sasa waterfalls near Alavanyo.

Climate & Vegetation:

1. Major rainy season -May to September
2. Minor rainy season -August to October
3. Dry (Harmattan) season -November to February

The vegetation is trans-seasonal. There are the forest and semi-savannah vegetation zones.

Socio-Political Organisation:

Tribes: The tribes in the District include Ewes, Logbas, Likpes, Akpafus, Lolobi and Santrokofi.

Religion: Christianity is the main form of religious expression, followed by Islam. Traditional African worship is also common.

Recreation: Recreational activities are mainly drumming and dancing. These include Borborbor, Agbadza, Asafo and Islamic dances. They are performed during festivals and funerals. The district lacks sports facilities except for a few playing fields in the secondary schools and training colleges. The district is also dotted with

many small drinking bars and 'chopbars' (eating places where mainly local foods are sold)

Crafts: Weaving of Cloth (Kente) and carving are the commonest crafts.

Traditional Administration: The traditional authority is called Gbi Traditional Council with Togbe Gabusu VI as the Paramount chief who presides over the divisional and sub-chiefs.

Economic Activities: The main activities include: farming (55%), which is physically intensive trading (30%), livestock rearing (10%) and others (5%). Main farming produce are maize, cassava, rice, yam and other cash crops.

Industries: There is ceramic works at Ve-Koloenu. Gun smiting is undertaken in some communities in the district, while palm oil extraction takes place at Logba.

Communication: There is a new automatic telephone link with the rest of the country. There is radio equipment at the District Health Administration Office which link Hohoe with most of the other District Health Administrations in the region.

Road Type and Network:

There is one tarred road that links Hohoe to the Southern half of the Region and the Headquarters in Accra. Hohoe to Jasikan road is also tarred. The Golokwati/Liati road to Leklebi is also under construction. Most of the roads in the district are not

tarred. Some of the roads become un-motor able during the rainy season. One State Transport Bus and several other vehicles ply these roads to Accra and other parts of the country and the district

Information on Hohoe District Health Directorate

Health Facilities

Hohoe district has a total of 33 health facilities. These include one mission health centre, three private clinics and one government hospital, the Hohoe District Hospital. The rest are government health centres and clinics.

The District hospital has a modern physiotherapy department which has only one session per week-Tuesdays (0800-1600 hours) attending to over 40 patients with various ailments arising out of mainly non-communicable, chronic diseases. There is one visiting physiotherapist from Ho Regional Hospital and an assistant for this weekly service. All the level B facilities are manned by Medical Assistants, Midwifery Superintendents, Senior Staff Midwives and Senior Enrolled Nurses.

1. Number of Health Facilities:

Government Owned	=	28
Mission	=	1
Private	=	3
Community	=	3
Total	=	35

2. **Health Care Delivery:** Curative Care, Preventive Care and Reproductive and Child Health Care, Health Education and other health care delivery activities.

Table 1.2 Doctor Patient Ratio

	2001	2002	2003
Using Out Patient Data	1:9,125	1:8650	1:7,826
Using In Patient Data	1:1,369	1: 927	1: 1025

Table 1.3 Nurse Patient Ratio

	2001	2002	2003
Using out patient data	1:431	1:500	1:452
Using In patient data	1:22	1: 40	1:46

Table 1.4 Immunization Programs

Immunization Coverage using 2.7% of total Population.

ANTEGEN	TARGET	ACHIEVED	%
BCG	4372	5097	11
Polio 3	4372	4325	98.9
Penta3	4372	4319	98.8
Measles	4372	4239	97
Yellow Fever	4372	4140	94.7

Disease Patterns

Table 1.5 Morbidity Rates for the top ten causes of OPD attendances 2003

	Number of cases seen	Percentage	Morbidity Rate Per 1000
Malaria	22859	57.1%	571‰
Acute Respiratory tract infection	3331	8.3%	83‰
Acute eye infection	3056	7.6%	76‰
Hypertension	2231	5.6%	55.7‰
Diabetes Mellitus	1847	4.6%	46.1‰
Disease of skin & ulcers	1474	3.7%	36‰
Intestinal worm	1420	3.5%	35‰
Diarrhoea Disease	1343	3.4%	33.5‰
Home & occupational accidents	1288	3.2%	32‰
Acute ear infection	1212	3.0%	30‰
TOTAL	40,061	100%	

Table for OPD attendances shows the district has significant rates for the non-communicable diseases-hypertension and diabetes; occupying the 4th and 5th positions respectively.

CHAPTER TWO

2.0 LITERATURE REVIEW

Much of the Literature review and the collaboration that typified this study emanated from the experiences of researchers from the US, the EU, South Africa and Asia (India). Though the demographic as well geographical and economic considerations influence patterns and levels of physical activity, the differences do not obviate the increasing awareness of physical activity as a core component in health promotion.

Data on physical activity is lacking in Ghana. The situation is much the same all over Africa with the exception of South Africa, where in the last two decades research interest in physical activity has caught the attention of academia.

In Ghana, the major non-communicable diseases of public health importance are cardiovascular diseases (CVD), diabetes mellitus, cancers asthma and sickle cell disease.

Nationally in the year 2000, hypertension was ranked as the 9th leading cause of hospital outpatient (OPD) visits. Though it has held this ranking since 1985 the percentage of OPD visits has risen steadily from 1.23% to 2.01% over the said period [10]. In the Hohoe district, 5.6% of hospital OPD attendances were due to hypertension, and was the 4th ranked overall and 2nd (adults') cause of morbidity (Annual Report, Hohoe District, 2003).

Respiratory diseases were ranked 2nd in the list of top ten diseases over the period 2001 to 2003 (Ghana Health Service, Hohoe District, 2003). Earlier studies conducted in some Ghanaian communities indicated that 20% of civil/public servants smoked tobacco while prevalence in the general population was only 15.1% [21]. National figures for smoking-related mortality in 45+ year age group are 219 males and 84 females/100,000 population [22].

Reported cases of diabetes mellitus in the country are also on the increase. In the earliest hospital outpatient survey at KBTH in 1958 reported a prevalence of 0.4% which remained unchanged for about 20 years¹¹. Reported cases were about 50% higher in females than in males. A survey of male community members aged > 15 years in 1964 showed a 0.2% prevalence of diabetes¹². Diabetes accounted for 6.4% of all medical admissions at the Korle Bu Teaching Hospital (KBTH) between 1986 January 1987 compared with 3.5% a decade earlier¹³.

Common cancers in Ghana include those of the cervix, breast, liver, lymphomas and leukaemias. Screening of 217 women aged 20-80 years from the Greater Accra Western and Upper East regions from April 1996 till August 1997 revealed that 277 (39%) had some breast abnormality including 13 (39%) had clinically obvious cancers¹⁴. Rudimentary data collected from the KBTH indicate a steady increase in patients for breast and cervical cancers from 1999 through 2002. Figures for breast cancer rose from 74 to 166 in the said period whilst those for cervical cancer have increased from 136 to 189.

Despite the many benefits of an active lifestyle, levels of physical activity have declined in recent years and remain low for all populations of Americans (Table 1). More than 60% of U.S. adults do not engage in recommended amounts of physical activity; 25% are not active at all. In the summer of 1996, the U.S. Surgeon General published *Physical Activity and Health*, a landmark report designed to reverse these trends and get Americans moving. Here is a summary of its findings:

- People of all ages benefit from regular physical activity.
- People can obtain significant health benefits by including a moderate amount of physical on most, if not all, days of the week. Through a modest increase in daily activity, most Americans can improve their health and quality of life.
- Additional health benefits can be gained through greater amounts of physical activity. People who can maintain a regular regimen of more vigorous or longer-duration activity are likely to obtain even greater benefits.

2.1 PHYSICAL ACTIVITY (PA)

Physical Activity may be defined as any body movement carried out by the skeletal muscle and requiring energy whereas exercise which forms the bedrock of leisure-time physical activity is a planned, structured, repetitive movement of the body designed to improve or maintain physical fitness.

Epidemiological research suggests that physical activity may play an important role in the management of mild-to-moderate depression and anxiety. Studies of older adults with depression or anxiety have been limited, but physical activity appears beneficial

to this population as well ⁸. Adopting healthy behaviours such as eating nutritious foods, being physically active and avoiding tobacco use can prevent or control the devastating effects of chronic diseases.

Indicators and guidelines for the surveillance of physical activity in developing countries are essential to inform policy and health promotion interventions.

The new one-hour-a-day-total exercise goal stems from studies of how much energy is expended on average each day by individuals who maintain a healthy weight. Energy expenditure is cumulative, including both low-intensity activities of daily life, such as stair climbing and housecleaning, and more vigorous exercise like jogging briskly, swimming and cycling. Someone in a largely sedentary occupation can achieve the new exercise goal by engaging in a moderate-intensity activity, such as walking at 4 miles (about 6km) per hour, for a total of 60 minutes every day, or engaging in a high-intensity activity, such as jogging for 20 to 30 minutes four to seven days per week.

The levels of physical activity – ‘insufficiently active’, ‘sufficiently active’ and ‘highly active’ (HEPA—High Enhancing Physical Activity) are the attributes that will eventually reflect on one’s physical fitness—expressed overtly as cardiovascular endurance and muscular strength.

2.1.1 DOMAINS OF PHYSICAL ACTIVITY

Physical activities are often classified into domains that reflect the purpose of the activity. A common four-category is:

- **Occupational** (work-related)
- **Domestic** (housework, yard work, physically-active child care, chores)
- **Transportation** (walking or bicycling for the purposes of going somewhere)
- **Leisure-time** (discretionary or recreational time for hobbies, sports and exercise).

Hospital-based physiotherapy may be added as a special category offering patient services

Existing physical activity assessment questionnaires differ as to which domains are measured and few assess multiple domains. Historically, strategies to promote physical activity have emphasized increases in Leisure-Time Physical Activity (LTPA) and consequently, many questionnaires focus on only this domain. More recently, strategies to promote physical activity have emphasized the health benefits of all kinds of physical activity. Adults attain recommended levels of physical activity by meeting a moderate-intensity physical activity recommendation, a vigorous intensity physical activity recommendation or both.

Physical activity can be assessed in three general ways:

- **Questionnaire,**
- **Observation and direct measurement, or**
- **Diary.**

2.1.2 INTENSITY, DURATION AND FREQUENCY OF PHYSICAL ACTIVITY

The new one-hour-a-day-total exercise goal stems from studies of how much energy is expended on average each day by individuals who maintain a healthy weight. Energy expenditure is cumulative, including both low-intensity activities of daily life, such as stair climbing and housecleaning, and more vigorous exercise like jogging briskly, swimming and cycling. Someone in a largely sedentary occupation can achieve the new exercise goal by engaging in a moderate-intensity activity, such as walking at 4 miles (about 6km) per hour, for a total of 60 minutes every day, or engaging in a high-intensity activity, such as jogging for 20 to 30 minutes four to seven days per week (fig 1.1). A low intensity PA will usually involve energy expenditure of less than 150 kcal or less than 600 METS-min/week. Moderate intensity is between 150 kcal – 999 kcal or between 600 METS-min 1500 METS-min/week. Energy expenditure in excess of 1000 kcal or 1500 METS-min/week may be classified as vigorous. It is important to note that for moderate intensity activity the duration must necessarily be more than 30minutes 3times per week and vigorous intensity must be not less than 20minutes and 5times per week.

Higher intensity activities require less time spent. Lower intensity activities require more time spent.

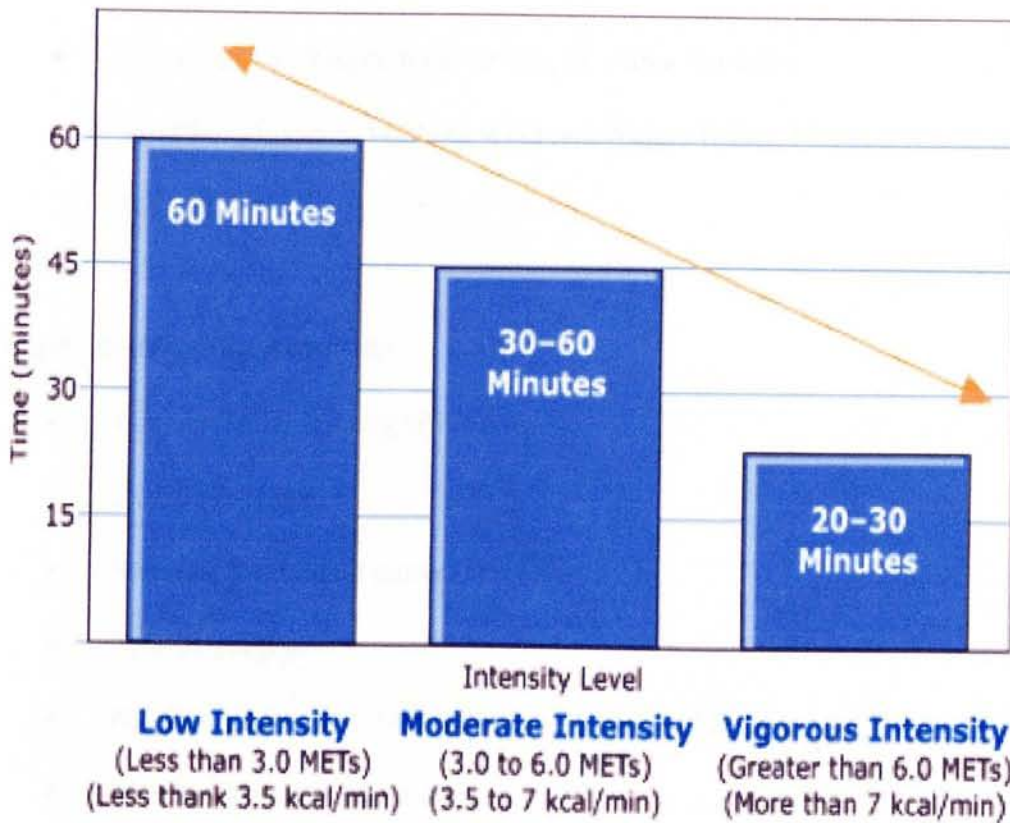
Light-Intensity Activities:

- Walking slowly
- Golf, powered cart

- Gardening or pruning
- Bicycling, very light effort
- Dusting or vacuuming
- Conditioning exercise, light stretching or warm up

Figure 2.1

Time Depends on Intensity



References: Ainsworth BE, Haskell WL, Leon AS, et al. Compendium of physical activities: classification of energy costs of human physical activities. *Medicine and Science in Sports and Exercise* 1993; 25(1): 71-80. Borg G. *Perceived exertion and pain scales*. Champaign (IL): Human Kinetics, 1998.

Moderate-Intensity Activities:

- Walking briskly
- Golf, pulling or carrying clubs
- Swimming, recreational
- Mowing lawn, power motor
- Tennis, doubles
- Bicycling 5 to 9 mph, level terrain, or with a few hills
- Scrubbing floors or washing windows Weight lifting, Nautilus machines or free weights

Vigorous-Intensity Activities:

- Race walking, jogging or running
- Swimming laps
- Mowing lawn, hand mower
- Tennis, singles
- Bicycling more than 10 mph, or on steep uphill terrain
- Moving or pushing furniture
- Circuit training



2.1.3 LEVELS OF PHYSICAL ACTIVITY

The levels of physical activity – ‘insufficiently active’, ‘sufficiently active’ and ‘highly active’ (HEPA—High Enhancing Physical Activity) are the attributes that will eventually reflect on one’s physical fitness—expressed overtly as cardiovascular endurance and muscular strength.

There are three levels of physical activity suggested for classifying populations; these are the new proposed levels, which take account of the concept of total physical activity of all domains. The proposed levels are:

- [i] ‘Inactive’
- [ii] ‘Minimally’ active
- [iii] ‘HEPA active’ (health enhancing physical activity; a high active category).

1. Inactive (CATEGORY 1)

This is the lowest level of physical activity. Those individuals who not meet criteria for Categories

2 or 3 are considered ‘**insufficiently active**’ [CATEGORY 1].

2. Minimally Active (CATEGORY 2)

The minimum pattern of activity to be classified as ‘sufficiently active’ is any one of the following 3 criteria:

- a) 3 or more days of vigorous activity of at least 20 minutes per day **OR**
- b) 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day **OR**

- c) 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

Individuals meeting at least one of the above criteria would be defined as achieving the minimum recommended to be considered '**minimally active**' [CATEGORY 2]. This category is more than the minimum level of activity recommended for adults in current public health recommendations, but is not enough for 'total PA' when all domains are considered. IPAQ measures total physical activity whereas the recommendations are based on activity (usually leisure-time or recreational) over and above usual daily activities.

3. HEPA active (CATEGORY 3)

A separate category labeled '**HEPA**' level, which is a more active category [CATEGORY 3] can be computed for people who exceed the minimum public health physical activity recommendations, and are accumulating enough activity for a healthy lifestyle. This is a useful indicator because it is known that higher levels of participation can provide greater health benefits, although there is no consensus on the exact amount of activity for maximal benefit. Also, in considering lifestyle physical activity, this is a total volume of being active which reflects a healthy lifestyle. It is at least 1.5-2 hours of 'being active' throughout the day, which is more than the LTPA-based recommendations of 30 minutes.

In the absence of any established criteria, the IPAQ scientific group proposes this new cut point, which equates to approximately at least 1.5 -2 hours of total activity per day, of

at least moderate-intensity activity. It is desirable to have a 'HEPA' activity category, because in some populations, a large proportion of the population may be classified as 'minimally active' because the IPAQ instruments assess all domains of activity. Category 3 sets a higher threshold of activity and provides a useful mechanism to distinguish variation in sub-population groups.

4. The two criteria for classification as 'HEPA active' are:

- a) Vigorous-intensity activity on at least 3 days achieving a minimum of at least 1500 MET-minutes/week **OR**
- b) 7 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week.

2.2 PHYSICAL FITNESS

Physical fitness is defined as "a set of attributes that people have or achieve that relates to the ability to perform physical activity"⁹. It may also be defined as the ability of the human body to function with vigour and alertness, without undue fatigue, and with ample energy to engage in leisure activities, and to meet physical stress. Muscular strength and endurance, cardio respiratory integrity and general alertness are the overt signs of physical fitness.

The goal of physical activity is to achieve physical fitness. Physical fitness is made up of five components; cardio respiratory endurance, muscular strength, muscular endurance, body composition and flexibility. It is one of the dominant attributes of the seven

dimensions of wellness, an expanded view of health. The other dimensions of wellness are spiritual, emotional, intellectual, interpersonal and social, and environmental or planetary wellness.

Being physically fit is not defined only by the kind of activity one does, how long it is done, or at what level of intensity. While these are important measures of fitness, they only address single areas. And in order to assess one's level of fitness, all 5 components are assessed together.

2.2.1 CARDIO RESPIRATORY ENDURANCE

The ability of the body to perform prolonged, large-muscle, dynamic exercise at moderate-to-high levels of intensity. Continuous rhythmic movements of large muscle groups such as walking, jogging, swimming, cycling and aerobic dance develop this **cardio respiratory endurance**. Others are start-and-stop activities such as tennis, squash, soccer and rope skipping. It is the single most important component of health-related fitness because the functioning of the heart and lungs is so essential to overall good health. Low levels of cardiorespiratory fitness are linked with heart disease, the second leading cause of morbidity and mortality, and the most significant non-communicable disease among the adult population in the Hohoe district. (Ghana Health Service, Hohoe District, 2002)

Cardio respiratory endurance is assessed or measured by seeing how well the cardio respiratory system transports and uses oxygen. The upper limit of this measure is called maximal oxygen consumption, (or VO_{2max}), which can be estimated reasonably well

through cheap assessment tests such as:

1. The one-mile walk test
2. 3-minute step test
3. 1.5-mile run-walk test
4. Åstrand-Rhyming cycle ergometer test

2.2.2 MUSCULAR STRENGTH

Muscular Strength is the maximum amount of force a muscle can produce in a single effort, and assessed by measuring the maximum amount of weight a person can lift at one time. This single maximum movement is referred to as **Repetition Maximum (RM)**. Taking the 1-RM tests for the bench press and the leg press can assess the strength of the major muscle groups. The Dynamometer is a device used to assess the grip strength, also a measure of muscular strength.

2.2.3 MUSCULAR ENDURANCE

Muscular endurance is the ability of a muscle to exert a sub maximal net force repeatedly or continuously over time. This ability depends on muscular strength because a certain amount of strength is required for any muscle movement. Muscular endurance is usually assessed by combining the maximum **number of repetitions** of a muscular contraction (such as in **push-ups**) or the maximum amount of time a person can hold a muscular contraction (such as in the flexed-arm hang). Muscular endurance of the major groups can be tested by taking the 60-second sit-up or the curl-up and push-up tests. Both muscular strength and endurance are improved with resistance training with weights or performing

callisthenic exercises such as push-ups and sit-ups

2.2.4 BODY COMPOSITION

This is the body's relative amount of fat and fat-free mass. People whose body composition is optimal tend to be healthier, to move more efficiently, and to feel better about themselves. This combines diet and a regular exercise programme which comprises endurance exercise similar to those designed for cardiorespiratory endurance. Typically, resistance exercise helps strengthen and build muscle mass, which to some extent helps increase metabolism thereby optimising body composition.

It is assessed by the **Body Mass Index (BMI)** given by the formula: **weight in kilograms/height in metre squared**. Other methods of assessing body composition are skin fold measurements, and other complex but more accurate procedures such as **underwater weighing**, The Bod Pod and Bioelectrical Impedance Analysis, the descriptions of which are beyond this text.

2.2.5 FLEXIBILITY

Flexibility is the ability of a joint to move through its full range of motion. It is highly adaptable and specific to each joint. The benefits of flexibility include preventing abnormal stresses that lead to joint deterioration and possibly reducing the risk of injuries and low back pain. This is developed by stretching the major muscle groups regularly and with the appropriate techniques.

Assessment most often by the **sit-and-reach test** or comparisons can be made to a chart showing normal range of motion for major joints.

The various estimations are:

1. Sit-and-Reach Test
2. Range-of-Motion Assessment

In response to expanded activity recommendations designed to include health-related lifestyle activities, new Behavioural Risk Factor Surveillance System (BRFSS) physical activity questions have been developed in the United States. After cognitive, validity, and reliability testing, the new lifestyle activity questions were used in the 2001 BRFSS. A separate question allowed tracking of physical inactivity during leisure time across years and was used in the 2000 and 2001 BRFSS questionnaires¹⁶. This report presents data from responses to the 2000 BRFSS leisure-time activity questions and the updated lifestyle activity questions of the 2001 BRFSS to compare overall U.S. and state-specific prevalence estimates for adults who engaged in physical activities consistent with recommendations from both survey years. The findings indicate that even with a more complete measure of physical activity than used previously, the majority of U.S. adults are not physically active at levels that can promote health.

BRFSS is a population-based, random-digit-dialled telephone survey of the civilian, non-institutionalized U.S. population aged >18 years in the 50 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands. Physical activity data were analyzed from the 2000 (n = 180,244; response rate: 48.9%) and 2001 BRFSS (n = 205,140; response rate: 51.1%)¹⁷. In 2000, BRFSS respondents were asked to report

frequency and duration of the two most common leisure-time physical activities or exercise in which they participated during the preceding month (Table 2.2). Vigorous-intensity activities were defined as activities consistent with the metabolic equivalent of $>60\%$ $VO_2\text{max}$ * all other activities were classified as moderate-intensity.

In 2001, BRFSS respondents were asked to recall overall frequency and duration of time spent in household, transportation, and leisure-time activities of moderate-intensity (e.g., vacuuming, gardening, brisk walking, or bicycling) and of vigorous intensity (e.g., running, aerobics, or heavy yard work) in a usual week (Table 2.2). Intensity was self-ascribed and defined by using a lead-in statement to the questions. Respondents were asked whether activities in which they participated caused "large" (vigorous) or "small" (moderate) changes in breathing and heart rate. Respondents were classified as active at the recommended level if they reported sufficient physical activities of moderate intensity (i.e., >30 minutes per day, >5 days per week) or of vigorous intensity (i.e., >20 minutes per day, >3 days per week). The 2001 BRFSS estimates provide the current baseline for states.

In 2000, a total of 26.2% of adults engaged in activities consistent with the physical activity recommendations, compared with 45.4% in 2001 (Table 2.3). Physical inactivity, measured by the same tracking question, was similar in 2000 (27.4%) and in 2001 (26.0%) (Table 2.4).

In 2001, the state-specific percentage of adults who engaged in activities consistent with the physical activity recommendations ranged from 28.9% to 55.8%. State-

specific estimates for physical inactivity remained similar during 2000--2001; absolute differences ranged from 0.1% to 12.0%.

Table 2.2

TABLE 1. Physical activity- and inactivity-tracking questions to assess the prevalence of persons who engaged in activity consistent with physical activity recommendations — Behavioral Risk Factor Surveillance System, 2000 and 2001

Category	2000	2001
Inactivity	During the past month, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?	During the past 30 days, other than your regular job, did you participate in any physical activities or exercise such as running, calisthenics, golf, gardening, or walking for exercise?
Physical activity	<p>What type of physical activity or exercise did you spend the most time doing during the past month? (Choose from list of activities) If answered walk/run/jog/swim: How far did you usually walk/run/jog/swim?</p> <p>How many times per week or per month did you take part in this activity during the past month?</p> <p>And when you took part in this activity, for how many minutes or hours did you usually keep at it?</p> <p>Was there another physical activity or exercise that you participated in during the last month?</p> <p>What other type of physical activity gave you the next most exercise during the past month? (Choose from list of activities) If answered walk/run/jog/swim: How far did you usually walk/run/jog/swim?</p> <p>How many times per week or per month did you take part in this activity during the past month?</p> <p>And when you took part in this activity, for how many minutes or hours did you usually keep at it?</p>	<p><u>Lead-in:</u> We are interested in two types of physical activity: vigorous and moderate. Vigorous activities cause large increases in breathing or heart rate while moderate activities cause small increases in breathing or heart rate.</p> <p>Now thinking about the moderate physical activities you do (or you are not working) in a usual week, do you do moderate activities for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes small increases in breathing or heart rate?</p> <p>How many days per week do you do these moderate activities at least 10 minutes at a time?</p> <p>On days when you do moderate activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?</p> <p>Now thinking about the vigorous physical activities you do (or you are not working) in a usual week, do you do vigorous activities for at least 10 minutes at a time, such as running, aerobics, yard work, or anything else that causes large increases in breathing or heart rate?</p> <p>How many days per week do you do these vigorous activities at least 10 minutes at a time?</p> <p>On days when you do vigorous activities for at least 10 minutes at a time, how much total time per day do you spend doing these activities?</p>

In 2000 and 2001, a tracking question was used to quantify physical inactivity (Table 2.2). In the 2000 BRFSS, the inactivity question immediately preceded other physical activity questions and specifically referred to leisure-time activities. In the 2001

BRFSS, the inactivity question was asked separately and earlier in the survey (i.e., several sections before the lifestyle physical activity questions) to reduce recall bias. Because of its placement, the wording was changed to include the phrase "other than your regular job."

Data were adjusted for no responses, age-adjusted to the 2000 U.S. standard population, and weighted to provide state and overall estimates. Confidence intervals were calculated by using SUDAAN to adjust for the complex survey sample design.

The new 2001 lifestyle activity questions classified more persons in the United States as physically active than did the 2000 leisure-time activity questions. In 2000, a total of 26.2% of adults engaged in activities consistent with the physical activity recommendations, compared with 45.4% in 2001 (Table 2.3). Physical inactivity, measured by the same tracking question, was similar in 2000 (27.4%) and in 2001 (26.0%) Table 2.4.

In 2001, the state-specific percentage of adults who engaged in activities consistent with the physical activity recommendations ranged from 28.9% to 55.8%. State-specific estimates for physical inactivity remained similar during 2000--2001: absolute differences ranged from 0.1% to 12.0%¹⁸.

In a study undertaken by scientists from the United States and Canada under the auspices of the Institute of Medicine's Food and Nutrition Board and published in a press release in September 2002 by the National Academy of Sciences, the report

stressed the importance of balancing diet with exercise, recommending total calories to be consumed by individuals of given heights, weights, and genders for each of four different levels of physical activity. For example, a 30-year-old woman who is 5 feet 5 inches tall and weighs 111 to 150 pounds should consume between 1,800 and 2,000 calories daily if she lives a sedentary lifestyle. However, if she is a very active person, her recommended total caloric intake increases to 2,500 to 2,800 calories per day. If her lifestyle fits the moderately active category as defined in the report, which is the minimum level of activity to decrease risk of chronic disease, she should eat between 2,200 and 2,500 calories daily. Using grams for the recommended ranges of intake, she should consume 55 to 97 grams of fat and 285 to 375 grams of carbohydrates per day. The associations between physical activity, coronary risk-index and burnout, with specific focus on the role of physical activity on the coronary risk-burnout relationship, were studied. Altogether 833 white South African male executives were evaluated by a self-report physical activity index, coronary risk index and burnout index questionnaire. The high- ($\geq 1000 \text{kcal}\cdot\text{week}^{-1}$) and moderate active ($151\text{-}999 \text{kcal}\cdot\text{week}^{-1}$) executives reported statistically significant less ($p \leq 0.05$) burnout in comparison with their low active ($\leq 150 \text{kcal}\cdot\text{week}^{-1}$) colleagues. Moderate and high physical activity levels were statistically related ($p \leq 0.05$) to a reduction in the coronary risk-index. Similarly, burnout had a strong statistically significant influence ($p \leq 0.05$) on the development of coronary heart disease. Finally, physical activity portrayed a statistically significant ($p \leq 0.05$) reduction in the coronary risk-index within low, moderate and high burnout executives, but failed to influence the burnout-coronary risk relationship between the different burnout groups. It is

concluded that although physical activity does not influence the burnout-coronary risk relationship between different burnout groups significantly, it does seem to have a beneficial effect on the reduction of the coronary risk-index within different burnout groups.¹⁹

Health and fitness clubs play an important role in addressing the causes of hypokinetic diseases and coronary heart disease (CHD). In order to be well prepared, service providers should be aware of the health and fitness profiles of their clients when they join their clubs. In the current study 243 white female subjects between ages 13 to 70 years were assessed, the results analysed for risk factors and the findings compared with existing norms in literature. This study found that 19.8% of subjects smoked > 10 cigarettes per day which is a cause for concern. Although this is lower than the general female population of Durban the current subjects joined a health and fitness centre and could thus be regarded as health conscious. Before joining almost half (49.4%) of the subjects were inactive. The incidence of hypertension (systolic >140 mmHg and/or diastolic > 90 mmHg) as a risk factor for (CHD) among 16.5% of subjects was relatively low when compared to that reported for females in Durban. Cholesterol levels were also lower than the average for Durban females because 28.6% of the subjects were found to be borderline (5.2-6.2 mmol.l⁻¹) and 16.7% to be of a high risk (>6.2 mmol.l⁻¹). When using BMI, 19.3% of subjects were > 37.3 kg.m⁻² and therefore in a high-risk group for CHD. Multiple risk factor analysis revealed that 42.0% of subjects displayed two or more risk factors for CHD while 12.0% had three or more and 2.0% had four or more²².

This paper constitutes a comparative and longitudinal investigation of physical exercise and psychological wellness in a sample of health club members in Zululand, South Africa. The research was contextualized within a public health and community psychological model of mental health promotion. Physical exercise was categorized as regular or irregular, depending upon whether it met the criterion of exercising for an average of thirty minutes a day at least three times per week or not. A Wellness Profile was constructed from various questionnaires chosen on the basis of their relationship with the general construct of psychological wellness and administered to samples of health club members and university students. In the comparative investigation, health club members were more psychologically well than university students. Whether they were members of a health club or not, participants who were regular exercisers were found to be more psychologically well than irregular exercisers. In the longitudinal investigation, health club members who exercised regularly over a period of two or more months increased significantly in psychological wellness. The significance of the findings in themselves and for the promotion of public and mental health is discussed²³.

Optimal health could be significantly influenced by parameters such as physical activity and a healthy lifestyle. The objective of this study was to determine whether a relationship exists between leisure-time physical activity, lifestyle and health status of black male midlevel managers. Two hundred and twenty one (221) participants were selected from black midlevel management in a company in the public sector of the North West Province. The type, intensity, frequency and duration of participation in leisure time physical activity were determined by the physical activity index (PAI)

as suggested by Sharkey. The lifestyle habits and health status were determined by using the Belloc and Breslow index (BB) and the illness rating scale (IRS) of Wyler et al. respectively. Analyses of data indicated significant differences between physical activity and lifestyle as well as between lifestyle and health status. No significant differences between physical activity and health status were present. A multiple regression analyses indicated a relationship between sleep patterns and health. The health status of the employees could be improved by the implementation of physical intervention programmes, which could be beneficial for the company on the long-term²⁴.

Two cross-sectional population-based studies were carried out in Pelotas, Brazil. The first used an established compendium of PA to quantify levels of leisure-time PA and included 1,968 individuals aged 20-69 years. The cut off to define low levels of leisure-time PA was <500kcal/week. The second study used the short version of the International Physical Activity Questionnaire, addressing four components of PA (leisure-time, occupation, household and transportation) and included 3,182 subjects aged 20 years or more. The cut off to define low levels of total PA was <150 minutes/week. The prevalence of low leisure-time PA was 70.2% in the whole sample, 58.5% in men and 80.8% in women. After controlling for age, skin colour, schooling and economic level, the adjusted prevalence ratio (PR) for women in comparison to men was 1.37 (CI95% 1.28, 1.45; $p<0.001$). For total PA, the prevalence of low levels in the whole sample was 41.1%, while it was 40.2% in men and 41.8% in women. After controlling for the same variables mentioned above, the

adjusted PR for women was 1.02 (CI95% 0.92, 1.14; $p=0.7$).¹

Data were collected on the prevalence of physical activity in the 15 Member States of the European Union in the months October to December 2002 as part of the 58th Euro barometer in all 15 Member States. In total, 16,230 individuals age 15 years and older (about 1,000 per nation) were interviewed by personal interviews about their physical activity in the last 7 days using the IPAQ short questionnaire.

Overall, a differentiated picture emerges if the different intensities of physical activity (vigorous, moderate, walking), and the caloric expenditures (calculated in MET minutes per week) are compared. For the Member States as a whole, men had higher caloric expenditures per week than women, and with increasing age caloric expenditures decreased¹⁹

Table 2.3

TABLE 2. Age-adjusted percentage of respondents aged ≥ 18 years who engaged in activities consistent with physical activity recommendations, by state/area — Behavioral Risk Factor Surveillance System (BRFSS), United States, 2000 and 2001

State/Area	2000 BRFSS recommended physical activity ^a		2001 BRFSS recommended physical activity ^a	
	%	(95% CI) ^b	%	(95% CI) ^b
Alabama	25.0	(22.9–27.1)	42.4	(40.3–44.5)
Alaska	31.7	(28.7–34.7)	54.6	(51.6–57.6)
Arizona	25.9	(23.1–28.7)	51.2	(48.7–53.7)
Arkansas	24.7	(22.9–26.5)	45.4	(43.3–47.5)
California	28.8	(27.2–30.4)	45.8	(43.9–47.7)
Colorado	30.1	(27.8–32.4)	53.0	(50.5–55.5)
Connecticut	29.5	(27.8–31.2)	48.6	(47.2–50.0)
Delaware	26.3	(24.0–28.6)	41.4	(39.2–43.6)
District of Columbia	34.9	(32.3–37.5)	49.7	(46.9–52.5)
Florida	26.9	(25.5–28.3)	45.5	(43.7–47.3)
Georgia	24.7	(23.0–26.4)	39.2	(37.3–41.1)
Hawaii	34.8	(33.1–36.5)	50.4	(48.4–52.4)
Idaho	29.9	(28.4–31.4)	54.3	(52.5–56.1)
Illinois	26.5	(24.1–28.9)	45.6	(43.0–48.2)
Indiana	25.8	(24.0–27.6)	45.9	(44.1–47.7)
Iowa	23.7	(22.1–25.3)	43.8	(41.8–45.8)
Kansas	22.0	(20.6–23.4)	44.1	(42.4–45.8)
Kentucky	17.7	(16.4–19.0)	28.9	(27.3–30.5)
Louisiana	18.3	(17.1–19.5)	35.1	(33.5–36.7)
Maine	24.6	(22.6–26.6)	50.3	(48.0–52.6)
Maryland	28.4	(26.7–30.1)	45.0	(43.1–46.9)
Massachusetts	29.1	(27.9–30.3)	51.4	(50.1–52.7)
Michigan	29.1	(27.1–31.1)	45.5	(43.7–47.3)
Minnesota	26.6	(24.7–28.5)	48.5	(46.7–50.3)
Mississippi	21.3	(19.3–23.3)	37.6	(35.5–39.7)
Missouri	24.3	(22.5–26.1)	39.9	(37.8–42.0)
Montana	29.4	(27.1–31.7)	51.5	(49.1–53.9)
Nebraska	24.4	(22.6–26.2)	34.2	(32.3–36.1)
Nevada	29.0	(26.2–31.8)	49.8	(46.9–52.7)
New Hampshire	26.3	(24.1–28.5)	50.7	(48.9–52.5)
New Jersey	26.7	(25.0–28.4)	44.0	(42.3–45.7)
New Mexico	28.2	(26.5–29.9)	50.0	(48.0–52.0)
New York	25.5	(23.8–27.2)	44.8	(42.9–46.7)
North Carolina	21.5	(19.8–23.2)	42.3	(40.4–44.2)
North Dakota	26.1	(23.9–28.3)	46.8	(44.6–49.0)
Ohio	23.0	(20.9–25.1)	46.1	(44.0–48.2)
Oklahoma	22.6	(21.0–24.2)	38.9	(37.0–40.8)
Oregon	32.4	(30.7–34.1)	52.9	(50.7–55.1)
Pennsylvania	27.7	(26.0–29.4)	46.8	(44.9–48.7)
Rhode Island	29.8	(28.0–31.6)	48.7	(46.8–50.6)
South Carolina	24.4	(22.7–26.1)	45.3	(43.2–47.4)
South Dakota	25.0	(23.6–26.4)	44.5	(42.9–46.1)
Tennessee	18.4	(16.7–20.1)	36.9	(34.7–39.1)
Texas	25.3	(23.9–26.7)	42.9	(41.4–44.4)
Utah	29.8	(27.6–32.0)	53.1	(51.0–55.2)
Vermont	30.4	(28.7–32.1)	55.0	(53.3–56.7)
Virginia	27.4	(25.1–29.7)	47.6	(45.4–49.8)
Washington	32.4	(30.7–34.1)	55.5	(53.7–57.3)
West Virginia	21.5	(19.6–23.4)	48.4	(46.3–50.5)
Wisconsin	27.1	(25.1–29.1)	52.3	(50.3–54.3)
Wyoming	30.5	(28.4–32.6)	55.8	(53.8–57.8)
Total	26.2	(25.8–26.6)	45.4	(45.0–45.8)

^a Reported any physical activity for ≥ 30 minutes per day, ≥ 5 days per week or vigorous-intensity activity (metabolic equivalent $\geq 60\% \text{VO}_{2\text{max}}$) for ≥ 20 minutes per day, ≥ 3 days per week.

^b Reported moderate-intensity activities (i.e., brisk walking, bicycling, vacuuming, gardening, or anything else that causes small increases in breathing or heart rate) for ≥ 30 minutes per day, ≥ 5 days per week or vigorous-intensity activities (i.e., running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate) for ≥ 20 minutes per day, ≥ 3 days per week.

^c Confidence interval.

Table 2.4

TABLE 3. Age-adjusted percentage of respondents aged ≥ 18 years who reported no leisure-time physical activity, by state/area — Behavioral Risk Factor Surveillance System (BRFSS), United States, 2000 and 2001

State/Area	2000 BRFSS physical inactivity ^a		2001 BRFSS physical inactivity	
	%	(95% CI) ^b	%	(95% CI)
Alabama	31.8	(29.5–34.1)	31.1	(29.2–33.0)
Alaska	21.0	(18.5–23.5)	22.4	(20.1–24.7)
Arizona	33.9	(30.5–37.3)	21.9	(19.8–24.0)
Arkansas	27.8	(26.0–29.6)	31.1	(29.2–33.0)
California	26.5	(24.7–28.3)	26.6	(24.8–28.4)
Colorado	20.0	(17.9–22.1)	19.4	(17.5–21.3)
Connecticut	25.0	(23.5–26.5)	23.8	(22.6–25.0)
Delaware	27.9	(25.7–30.1)	25.6	(23.8–27.4)
District of Columbia	20.8	(18.6–23.0)	24.3	(21.9–26.7)
Florida	28.3	(26.8–29.8)	27.1	(25.6–28.6)
Georgia	29.4	(27.7–31.1)	27.6	(26.0–29.2)
Hawaii	23.2	(21.7–24.7)	18.8	(17.3–20.3)
Idaho	19.8	(18.5–21.1)	20.9	(19.5–22.3)
Illinois	29.3	(26.8–31.8)	26.6	(24.3–28.9)
Indiana	25.2	(23.4–27.0)	26.1	(24.6–27.6)
Iowa	27.0	(25.3–28.7)	25.5	(23.9–27.1)
Kansas	30.1	(28.5–31.7)	26.4	(25.0–27.8)
Kentucky	41.1	(39.4–42.8)	33.3	(31.8–34.8)
Louisiana	36.4	(34.9–37.9)	35.8	(34.3–37.3)
Maine	26.9	(24.7–29.1)	22.9	(21.2–24.6)
Maryland	24.2	(22.7–25.7)	24.3	(22.7–25.9)
Massachusetts	24.5	(23.4–25.6)	22.7	(21.7–23.7)
Michigan	22.9	(21.1–24.7)	23.3	(21.8–24.8)
Minnesota	24.7	(22.8–26.6)	17.1	(15.8–18.4)
Mississippi	33.7	(31.4–36.0)	33.5	(31.6–35.4)
Missouri	28.5	(26.7–30.3)	27.2	(25.4–29.0)
Montana	22.9	(20.9–24.9)	21.5	(19.7–23.3)
Nebraska	29.0	(27.2–30.8)	31.2	(29.4–33.0)
Nevada	24.9	(22.1–27.7)	22.7	(20.4–25.0)
New Hampshire	26.7	(24.4–29.0)	19.6	(18.2–21.0)
New Jersey	28.4	(26.7–30.1)	26.4	(24.9–27.9)
New Mexico	24.5	(22.9–26.1)	25.9	(24.3–27.5)
New York	29.1	(27.2–31.0)	28.6	(26.9–30.3)
North Carolina	30.6	(28.7–32.5)	26.3	(24.6–28.0)
North Dakota	24.2	(22.1–26.3)	23.0	(21.2–24.8)
Ohio	31.2	(28.9–33.5)	26.1	(24.3–27.9)
Oklahoma	34.2	(32.4–36.0)	32.5	(30.7–34.3)
Oregon	19.9	(18.4–21.4)	20.6	(18.9–22.3)
Pennsylvania	22.5	(20.9–24.1)	24.1	(22.5–25.7)
Rhode Island	27.2	(25.5–28.9)	24.6	(23.1–26.1)
South Carolina	28.1	(26.3–29.9)	26.6	(24.8–28.4)
South Dakota	26.2	(24.8–27.6)	25.0	(23.7–26.3)
Tennessee	32.5	(30.6–34.4)	34.7	(32.7–36.7)
Texas	28.7	(27.2–30.2)	27.3	(26.0–28.6)
Utah	15.9	(14.2–17.6)	17.1	(15.5–18.7)
Vermont	23.2	(21.7–24.7)	20.4	(19.1–21.7)
Virginia	25.1	(23.0–27.2)	23.4	(21.7–25.1)
Washington	16.8	(15.5–18.1)	17.1	(15.8–18.4)
West Virginia	33.5	(31.4–35.6)	31.3	(29.5–33.1)
Wisconsin	22.0	(20.2–23.8)	20.6	(19.0–22.2)
Wyoming	22.6	(20.7–24.5)	21.3	(19.7–22.9)
Total	27.4	(27.0–27.8)	26.0	(25.7–26.3)

^a No reported leisure-time physical activities (i.e., any physical activities or exercises such as running, calisthenics, golf, gardening, or walking).

^b Confidence interval.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This chapter discusses the methodology used for the study with a detailed discussion of the processes involved such as study design, sampling technique, methods of data collection, data processing and analysis and limitations of the study.

3.1 STUDY DESIGN

This was a baseline community-based, cross-sectional descriptive study to determine the patterns and levels of physical activity in the Hohoe district of the Volta Region of Ghana, and whether they are commensurate with the with the recommended levels of physical activity of at least 600METs-min in the literature.

Respondents were questioned about their physical activities across four domains namely: domestic or incidental; occupation or work-related; transport-related; and leisure-time physical activity using the International Physical Activity Questionnaire (IPAQ) short form. Specifically, they were asked about the intensity: walking (3.3 METs), moderate physical activity (4.0 METs) and vigorous physical activity (8.0 METs) in the last seven days; including in each case, the time spent in minutes (duration) and the number of sessions per week (frequency). Based on findings in studies elsewhere as stated in the literature that health benefits are dependent on a minimum level of physical activity (intensity x duration x frequency) = (4.0 METs x 30 min x 5 days) = 600 METs-min/week, the respondents were categorized into 'Sufficiently Active' or 'Insufficiently Active'.

3.1 DATA COLLECTION TECHNIQUES & TOOLS

Data were collected in the months June to August 2004 as part of the survey of physical activity patterns and levels in the Hohoe district. In total, 264 individuals aged 15 years and older (up to 69 years) were interviewed (personally and self-administered) about their physical activity in the last 7 days using the IPAQ (appendix 2) short questionnaire.

The items were structured to provide separate scores on walking; moderate-intensity; and vigorous-intensity activity as well as a combined total score to describe overall level of activity. Computation of the total score requires summation of the duration (in minutes) and frequency (days) of walking, moderate-intensity and vigorous-intensity activity.

Both qualitative and quantitative methods were employed to collect the data. Individual questionnaire were distributed to about 264 residents of the target population out of which 211 (79.2%) responded.

Focus Group Discussion, In-depth and Key Informant Interviews with:

- Physical training/education instructors
- District Sports Development Officer
- Leaders of Fitness Clubs
- Senior Health officials
- Opinion leaders etc.

also took place before, during and after the administration of the questionnaire providing valuable information.

For the FGD, after each session, the moderator and note-taker met to review and complete notes with the recorder complementing. A full report on each session was written and statements were coded. The answers of the different Focus Group Discussions were compared and appropriate modifications made.

3.2 STUDY POPULATION

The target population consisted mainly of male and female community members between the ages of 15 and 69 years. (The recommended age-range for using the IPAQ) in the Hohoe district.

All members were recruited for the study on the following basis of physical activities:

Duration: Minimum of 30 minutes per session

Intensity: Mild to moderate to vigorous

Frequency/week: 5 days (minimum)

- Non members of Keep Fit Clubs and physically active (as defined: see below) in the same area aged 15-69
- Members of Keep Fit Clubs at Hohoe aged 15-69 years
- Keep Fit Clubs in the study area



3.3 STUDY UNIT

- An Individual member from either group- (members/non members of keep fit clubs at Hohoe)
- Leaders of Keep Fit Clubs in the study area

3.4 STUDY VARIABLES

The dependent variables were levels of physical activity. The independent variables were the background information including age, gender, educational background, occupation etc. These were meant to examine the influences or possible relationships influencing the levels of physical activity in the Hohoe district.

3.5 SAMPLING TECHNIQUE

The sample was drawn from Hohoe District through convenience sampling

No data exist in Ghana on physical activity patterns or levels. In the BRFSS 2001 (US), the state-specific percentage of adults who engaged in activities consistent with the physical activity recommendations ranged from 28.9% to 55.8%². The expected frequency in Ghana may be in the same range across all the domains of physical activity with the lower range likely to be in the urban areas. Similar figures of between 40.2-41.8% were given as prevalence of 'Insufficiently active' in a study in Pelotas, Brazil as quoted elsewhere in the literature.

In order to make a good and precise generalization about the population, the researcher with a desired confidence level of 95%, expected frequency of 30% and a

worst acceptable value of 0.9% resolved to 445 sample size using stalcal of Epi info in the sample size estimation, which is given as follows:

Population Size:	165014
Expected Frequency:	30%
Worst Acceptable:	0.80 %
Confidence Level:	95%
Sample Size:	376%

Due to time constraints and limited resources the sample size was almost halved to 264 out of which 211 representing 79.2% responded.

3.6 SAMPLE SIZE

Since prevalence of physical activity has not been documented in this district and nationally, this number was derived from similar research in other countries with modification. There are only two fitness clubs in the district with a total membership of about 200 out of which about 100 were randomly selected against other randomly selected non-members of fitness clubs.

3.7 IMPLEMENTATION OF STUDY

The main instrument used in the study was the International Physical Activity Questionnaire (IPAQ).

The study was conducted with the assistance of the District Director of Health Services and supporting staff of the directorate and finally academic supervisors from the School of Public Health, University of Ghana. Further collaboration was sought from practitioners of gymnasia/fitness clubs etc. Interactive website approach with experts in sports medicine, physical education/activity was adopted to implement the study. Guidelines for the adoption of the International Physical Activity Questionnaire were sought from within and outside the country after which research assistants, mainly teachers and fitness enthusiasts; and a bio statistics officer of the District Health Directorate were recruited and trained.

After the pre-test and administration of questionnaire, quality control measures were instituted without unduly compromising the main format of IPAQ. The Coordinating Group of the IPAQ recognises the diversity of cultural as well as developmental differences among various communities within a country and between countries but recommends that the domains and the parameters they measure be maintained in its original form to enable comparisons to be made on the outcome of any such surveillance study. Furthermore, the criteria used to measure physical activity were strictly adhered to. For example any physical activity worthy of consideration for measurement should not be less than 10 minutes.

Focus groups for discussions were formed based on age groups, gender, religion, common characteristics/interests and common ideas sought from the outcome. The data processing and analysis were done using the International Physical Activity Questionnaire (IPAQ) guidelines.

In ensuring confidentiality and freedom of choice by participants, care was taken in avoiding compromising the tenets of IPAQ. As part of incentive package for participants and research assistants, those with specific problems related to the research or otherwise were assisted with appropriate interventions and recommendations.

A feedback mechanism adopted also provided the researcher an avenue to adopt measures to further enhance the goals of the study. It was not unusual to find that people suffering from various ailments (including HIV/AIDS victims) thought they didn't qualify to engage in physical activity as a way of promoting health a notion which was swiftly addressed by the researcher as part of the IEC method for promoting physical activity during the data collection.

In-depth interview with directors of health, physical education, fitness clubs, district hospital, Alavanyo clinic, district health management team, and selected church and community leaders with key informants interview guide was also employed.

Data were adjusted for no responses, age-adjusted to the 2000 U.S. standard population, and weighted to provide overall estimates. Confidence intervals were calculated by using SUDAAN to adjust for the complex survey sample design.

3.6 DATA PROCESSING AND ANALYSIS

Data processing and analysis were done using the guidelines set for the International Physical Activity Questionnaire (IPAQ). The data were analysed using Epi Info 2002

and verified for any errors. Frequency tables and cross-tabulations were run to compare the characteristics of ‘Sufficiently Active’ and ‘Insufficiently Active’ variables. There are many different ways to analyse data on physical activity [available on the website www.ipaq.ki.se], but to-date there is no consensus on a ‘correct’ method for defining or describing levels of activity based on self-report surveys.

Using the Ainsworth et al. Compendium (Medicine and Science in Sports and Exercise 2000) an average MET score was derived for each type of activity. These following values were used for the analysis of IPAQ data:

Walking = 3.3 METs,

Moderate PA = 4.0 METs and,

Vigorous PA = 8.0 METs.

3.9 DATA ANALYSIS

Both categorical and continuous indicators of physical activity are possible from the IPAQ short form. However, given the non-normal distribution of energy expenditure in many populations, the continuous indicator is presented as median minutes or median MET–minutes rather than mean minutes or mean MET–minutes. However the categorical scores were used in this study and the classification outlined below;

Categorical score

Regular participation is a key concept included in current public health guidelines for physical activity. Therefore, both the total volume and the number of day/sessions are

included in the IPAQ analysis algorithms. The three levels of physical activity used to classify the respondents (as defined elsewhere in the literature) were:

- (i) 'Insufficiently active',
- (ii) 'Sufficiently active',
- (iii) and 'high active'.

3.10 ETHICAL CONSIDERATIONS

In developing the study ethical issues were discussed and an instrument designed to explain the rationale behind the research and informed consent ('written' where literacy permitted) was obtained from participants. The community entry approach adopted also took care of possible breach of any cultural norms.

The ethics committee of the District Health directorate approved the study design before its implementation

3.11 LIMITATIONS OF STUDY

The findings in this report are subject to at least five limitations. First, IPAQ is based on self-reported data and is subject to recall bias. Second, although the lifestyle activity questions covered more activity domains than the previous traditional leisure-time questions, the domains cannot be considered separately with these few questions. Third, expanding the scope of questions to include more activities and intensity levels provides less information about particular activities. For example,

time spent specifically walking or running was not determined. Fourth, the questionnaire is not designed to assess whether a combination of moderate- and vigorous-physical activity might classify persons as active, because it was not possible to determine whether the moderate and vigorous activities occurred on different days. Therefore, a small proportion of active persons might have been misclassified as not participating in activities consistent with physical activity recommendations. Finally, response rates might have affected estimates.

Estimate for sample size calculation was based on prevalence elsewhere due to lack of data with significantly different characteristics. Time and financial constraints reduced the original concept of the study to do both comparative and longitudinal studies among the respondents across the domains of physical activities. The lack of sporting and recreational facilities in the district restricts a lot of physical activity to the other domains to the exclusion of leisure-time domain.



CHAPTER FOUR

4.0 RESULTS

The results from respondents are presented below. In all, 211 respondents participated in the survey from an initial target of 264 representing 79.2% response rate. These were made up of 121 males (57.3%) and 90 females (42.6%). The ages ranged from 15-59 years, with 91 (43.1%) respondents between 25-34 years. 73.0% of the total interviewed were at 54 years and below. The demographic characteristics of respondents closely reflected that of the population and it's captured in table 4.1.

TABLE 4.1 FREQUENCY DISTRIBUTION OF RESPONDENTS' AGE

AGE	FREQUENCY	PERCENTAGE	CUM. FREQ.
15-24	17	8.1%	8.1%
25-34	91	43.1%	51.2%
35-44	46	21.8%	73.0%
45-54	22	10.4%	83.4%
55-59	35	16.6%	100.0%
TOTAL	211	100.0%	100.0%

These results are in two parts for purposes of determining the physical activity patterns and levels in the Hohoe district. The first part of the results represents respondents' characteristics on the levels of physical activities as 'Sufficiently Active' or 'Insufficiently Active'. The third category of 'High Active' was merged with 'Sufficiently Active' due to the very low numbers. Even though the higher the level of physical activity the higher benefits are derived, the study sought to define the proportion of the sampled population who meet the minimum physical activity levels that confer health benefits. The second part presents the common domains and the various combinations irrespective of whether these activities are commensurate with the recommended adult physical activity level of 600 METS-min/week.

The information gathered from the focus group discussions dwelt on the responses from the questionnaire to the only two fitness clubs in the district and responses by the two leaders were almost identical. Both gave answers to appendix 5 as follows: The main objective is promoting fitness so they mostly enrolled 'healthy' and 'fit' people. Hence services were mainly centred on weight control programmes. Most of their members are either public/civil servants or self employed, with age range between 20 years to 70 years (2 persons). 80% of members are male. Neither had any screening procedure for prospective members, though they had trained physical instructors who are volunteers and are aware of the need for medical screening before engaging in any physical activity above baseline levels. They have experienced a few casualties though no fatalities had been reported. They believe if assistance from the state is forthcoming by way of personnel and equipment they could be of immense help to the general public. For now they depend on inadequate members'

subscriptions to run their programmes and will welcome some legislation to control their activities under a body akin to the President’s Special Initiative.

LEVELS OF PHYSICAL ACTIVITY

This was a fact-finding study to determine the patterns and levels of physical activity in the Hohoe district. The results of the 211 respondents are summarized below under gender, education, occupation income levels and age. The categorizations of moderate or highly intensive physical activities are as defined above.

TABLE 4.2 GENDER AND LEVELS OF PHYSICAL ACTIVITY

GENDER	LEVEL OF PHYSICAL ACTIVITY		TOTAL
	INSUFFICIENTLY ACTIVE	SUFFICIENTLY ACTIVE	
MALE	44 36.4%	77 63.7%	121 57.3%
FEMALE	76 84.4%	14 15.6%	90 42.6%
TOTAL	120 56.9%	91 43.1%	211 100.0%

Table (4.1) reports on respondents who regularly engaged in physical activity. The gender distribution showed overall male preponderance in at least being ‘sufficiently active’

TABLE 4.3 AGE AND LEVELS OF PHYSICAL ACTIVITY

AGE	LEVEL OF PHYSICAL ACTIVITY		TOTAL
	INSUFFICIENTLY ACTIVE	SUFFICIENTLY ACTIVE	
15-24	12 70.6%	5 29.4%	17 8.1%
25-34	65 71.4%	26 28.6%	91 43.1%
35-44	11 23.9%	35 76.1%	46 21.8%
45-54	14 63.6%	8 36.3%	22 10.4%
55-59	18 51.4%	17 48.6%	35 16.6%
TOTAL	120 56.9%	91 43.1%	211 100.0%

*Sufficiently Active were 43.1% of the respondents of whom males formed 84.6%.

63.7% of men were at least sufficiently active while 84.4% of the women were inactive with none in the highly active category (table 4.1)

The most active age group was between 35-44 years with 76.1% of respondents in that group being at least sufficiently active. The group also formed 39.3% of all sufficiently active respondents. 63.6% of those between 45-54 were inactive and 54.2% of all inactive persons are between 25-34 years (table 4.2).

TABLE 4.4 OCCUPATION AND LEVELS OF PHYSICAL ACTIVITY

OCCUPATION	LEVELS OF PHYSICAL ACTIVITY		
	INSUFFICIENTLY ACTIVE	SUFFICIENTLY ACTIVE	TOTAL
PUBLIC SERVANT	9 75.0%	3 25.0%	12 5.7%
FARMERS	20 27.4%	53 72.6%	73 34.6%
TRADER/SELF EMPLOYED	75 71.4%	30 28.6%	105 49.8%
OTHER	16 76.2%	5 23.8%	21 10.0%
TOTAL	120 56.9%	89 42.2%	211 100.0%

Farmers were the most active of all the occupations with 72.6% of them being sufficiently active and formed 59.6% of all sufficiently active persons. 75.0% of Public Servants were inactive followed by traders and self employed persons 71.4%, who were in the majority of all inactive persons, 62.5% (table4.3).

TABLE 4.5 INCOME AND LEVELS OF PHYSICAL ACTIVITY

INCOME LEVELS	LEVELS OF PHYSICAL ACTIVITY		TOTAL
	INSUFFICIENTLY ACTIVE	SUFFICIENTLY ACTIVE	
HIGHER THAN MINIMUM WAGE	15 26.8%	41 46.1%	56 26.5%
EQUAL TO MINIMUM WAGE	97 69.8%	42 30.2%	139 65.9%
BELOW MINIMUM WAGE	8 50.0% 6.7%	8 50.0% 9.0%	16 7.6%
TOTAL	120 56.9%	91 43.1%	211 100.0%

73.2% of high-income earners were active and also formed 46.1% of all respondents. The most inactive were average income earners 80.8% of respondents. Nearly 70% of them were inactive (table 4.4).

TABLE 4.6 EDUCATION AND LEVEL OF PHYSICAL ACTIVITY

EDUCATIONAL LEVEL	LEVELS OF PHYSICAL ACTIVITY		
	INSUFFICIENTLY ACTIVE	SUFFICIENTLY ACTIVE	TOTAL
UP TO BASIC	16 61.5%	10 38.5%	26
SECONDARY	57 69.5%	25 30.5%	82
POST-SECOONDARY	47 45.6%	56 54.4%	103
TOTAL	120 56.9%	91 43.1%	211

Higher education appears to play a role in physical activity as 61.8% of sufficiently active persons have post-secondary education. Those with secondary education were the most inactive (47.5%). (Table 4.5)

PATTERNS OF PHYSICAL ACTIVITY

The results below summarize the findings in the distribution of physical activity patterns in the Hohoe district. The respondents were categorizrd according to gender, age, occupation, education and income across the four domains of physical activity viz. domestic or incidental (household chores, routine daily activities etc); occupation (work-related); transportation; and leisure-time. It should be noted however that most occupations and everyday life activities involve some form of physical activity. This presentation involves examining the domains without necessarily categorizing them according to energy expenditure.

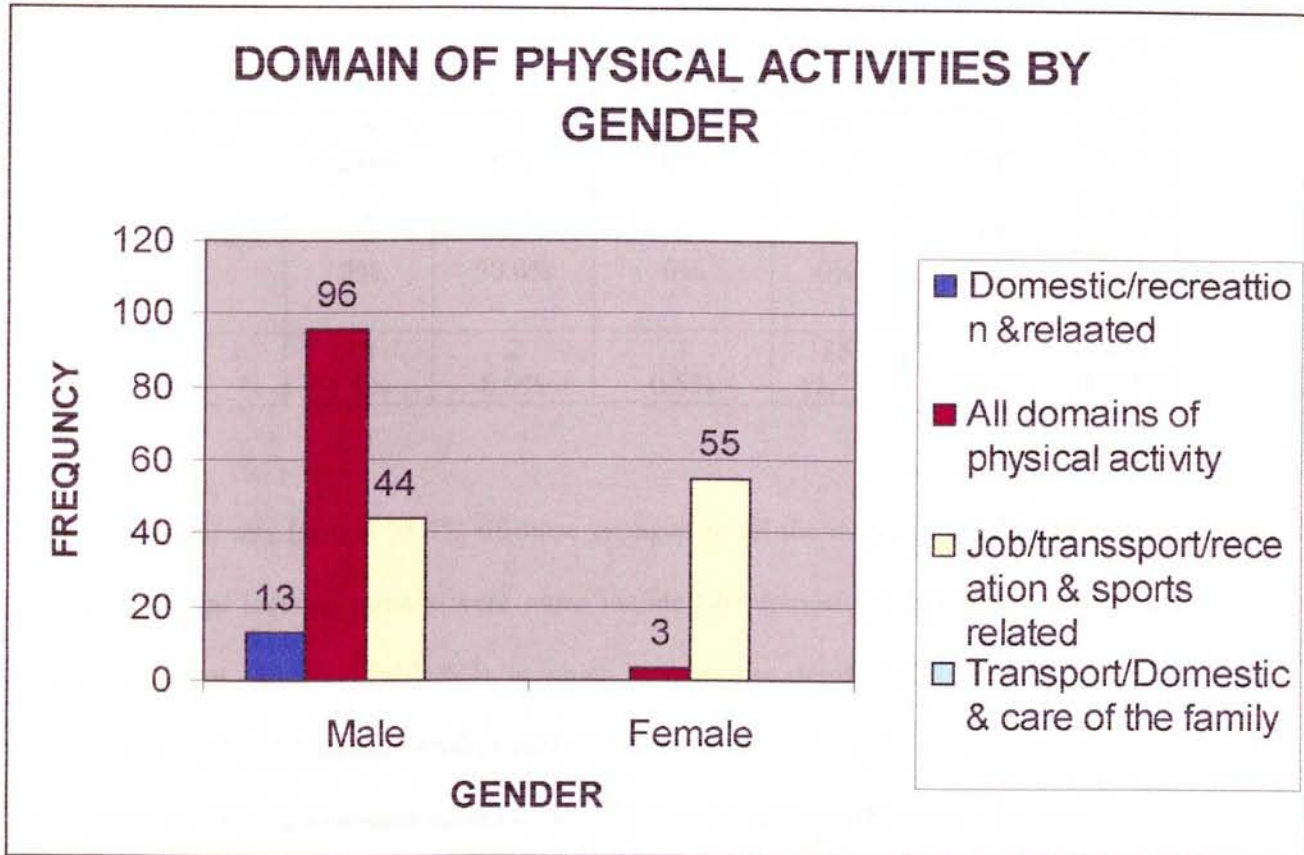
For all the independent variables, physical activity across all the domains was the commonest with 41.7% respondents, followed domestic or incidental and leisure-time 35%. For gender, the next common combination was domestic and leisure (35.5%) with a female preponderance (91.4%).

TABLE 4.7 DOMAIN OF PHYSICAL ACTIVITY AND GENDER

DOMAIN	GENDER		TOTAL
	MALE	FEMALE	
DOMESTIC & LEISURE	22 14.4%	53 91.4%	75 35.5%
JOB/ TRANSPORT/ DOMESTIC	2 1.3%	0 0%	2 0.9%
TRANSPORT/ DMESTIC/ LEISURE	2 1.4%	0 0%	2 9.5%
ALL DOMAINS	85 55.6%	3 5.2%	88 41.7%
JOB/ TRANSPORT/ LEISURE	42 27.5%	2 3.4%	44 20.9%
TOTAL	153 72.5%	58 27.5%	211 100.0%

41.7% of all respondents engaged in all the domains of physical activity of which 55.6% were males. 96.6% of males engaged in all domains, whereas the commonest activities among the female respondents were domestic and leisure-time physical activities with 91.4% (table 4.6).

Figure 4.1



Males dominated in all four domains with while more females were engaged in a combination of work, transport and recreational physical activity.



TABLE 4.8 INCOME AND DOMAIN OF PHYSICAL ACTIVITY

INCOME LEVEL	DOMAIN OF PHYSICAL ACTIVITY					Total
	DOMESTIC & LEISURE	JOB/TRANSPORT/DOMESTIC	TRANSPORT/DOMESTIC/LEISURE	ALL DOMAINS	JOB/TRANSPORT/LEISURE	
Higher than minimum wage	2 11.1%	1 50.0%	1 100.0%	48 54.5%	0 0%	56 26.5%
Equal to minimum wage	16 88.9%	0 0%	0 0%	40 45.5%	29 67.4%	13 65.9%
Lower than minimum wage	0 0%	1 50.0%	0 0%	0 0%	14 32.6%	16 7.6%
Total	18 8.5%	2 0.9%	1 0.5%	88 41.7%	43 20.4%	211 100.0%

High-income earners formed 54.5% of those engaged in all the domains of physical activity. Average income earners were more inclined to domestic and leisure-time physical activities (88.9%) (Table 4.7), in which females also dominated (tables 4.6). Low-income earners combined work, transportation and domestic activities, forming 50%, same as the high-income earners. Among income earners the next common physical activity domain combination was work, transportation and leisure (20%).

TABLE 4.9 AGES AND DOMAIN OF PHYSICAL ACTIVITY

AGE	DOMAIN OF PHYSICAL ACTIVITY					TOTAL
	DOMESTIC & LEISURE	JOB/ TRANSPORT/ DOMESTIC	TRANSPORT/ DOMESTIC/ LEISURE	ALL DOMAINS	JOB/ TRANSPORT/ LEISURE	
15-24	3 5.6%	0 0%	0 0%	2 2.3%	6 14.0%	
25-34	2 11.1%	1 50.0%	0 0%	41 46.6%	1 2.3%	
35-44	2 11.1%	1 50.0%	1 100.0%	38 43.2%	0 0%	
45-54	1 5.6%	0 0%	0 0%	3 3.4%	17 39.9%	
55-64+	12 66.7%	0 0%	0 0%	4 4.5%	19 44.2%	
Total	20 9.4%	2 0.9%	1 0.5%	88 41.7%	43 20.4%	211 100.0%

46.6% of those who engaged in all domains of physical activity were between the ages of 25 and 34 years; 43.2% between ages 35 and 44, a combined total of 89.8% for 25-44. For the younger age group (under 25 years) the commonest patterns were work, transportation and leisure, same as the older age group (55 years or more) with 14% and 44.2% respectively. Among all age groups the commonest combination was all domains of physical activity with 47.1%

TABLE 4.10 OCCUPATION DOMAIN OF PHYSICAL ACTIVITY

OCCUPATION	DOMAIN OF PHYSICAL ACTIVITY					TOTAL
	DOMESTIC/ LEISURE	JOB/ TRANSPORT/ DOMESTIC	JOB/ TRANSPORT / LEISURE	ALL DOMAINS	JOB/TRANSPORT/ LEISURE	
Farmer	16 21.9%	0 0%	1 1.4%	46 63.0%	9 12.3%	71 33.6%
Trader/Self- Employed	55 52.4%	1 1.0%	0 0%	40 38.1%	9 8.6%	105 49.8%
Public Servant	3 25.0%	1 8.3%	0 0%	2 16.7%	6 50.0%	12 5.7%
Others	1 4.8%	0 0%	0 0%	0 0%	20 95.2%	21 10.0%
Total	75 35.5%	2 0.9%	1 0.5%	88 41.7%	44 20.9%	211 100.0%

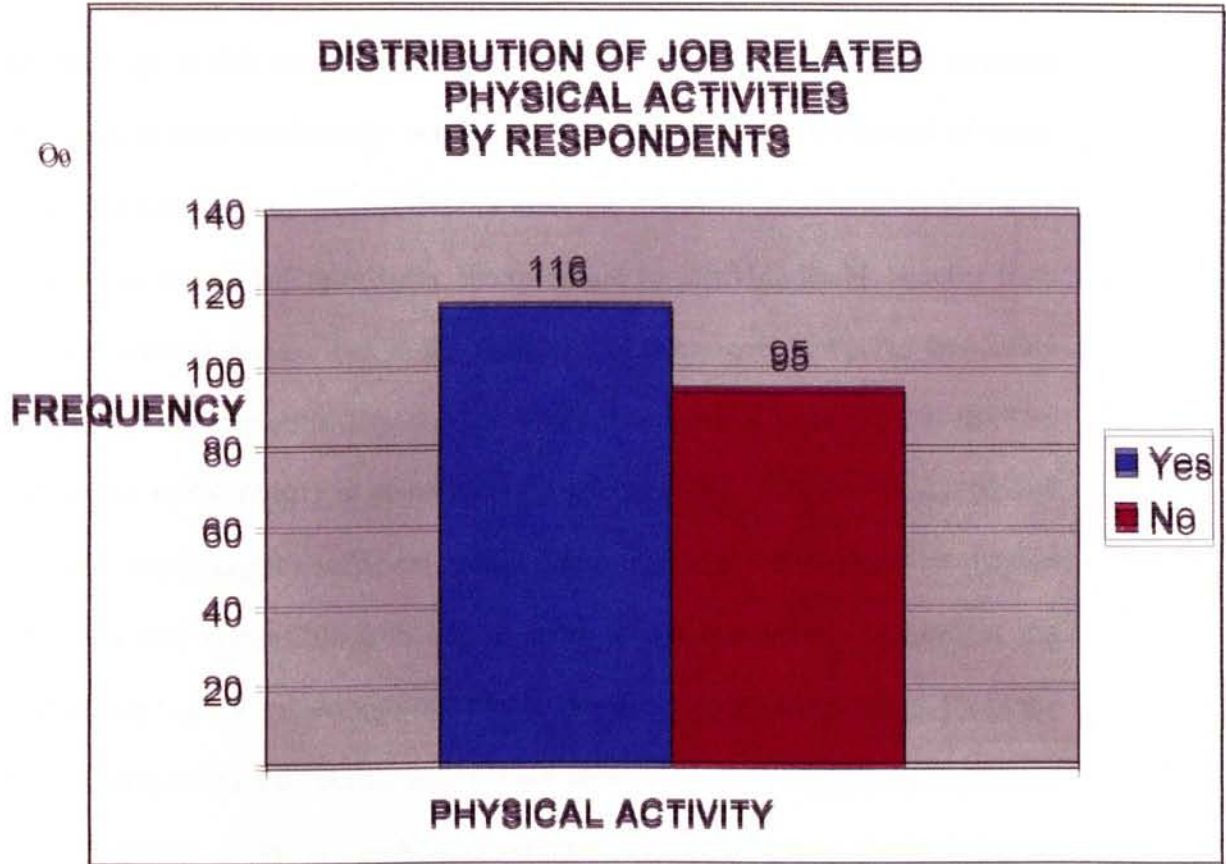
The table above shows that 52.3% of those who engaged in all domains of physical activity were farmers. Others made up of students; construction and vocational workers dominated the work, transport and leisure domains (45.5%).

TABLE 4.11 DOMAINS OF PHYSICAL ACTIVITY AND EDUCATION

EDUCATION	DOMAIN OF PHYSICAL ACTIVITY					TOTAL
	DOMESTIC & LEISURE	JOB/ TRANSPORT/ DOMESTIC	TRANSPORT/ DOMESTIC/ LEISURE	ALL DOMAINS	JOB/ TRANSPORT/ LEISURE	
Up to Basic	3 11.5%			17 65.3%	6 23.1%	26 12.3%
Secondary	13 15.7%			50 60.2%	20 24.1%	83 39.3%
Post-secondary	2 2.0%	2 2.0%	1 1.0%	80 78.4%	17 16.7%	102 48.3%
Total	18 8.5%	2 0.9%	1 0.5%	146 41.7%	43 20.4%	211 100.0%

Post-secondary education (78.4%) respondents were in the majority of those engaged in all the domains of physical activity (54.8%). Those with secondary education dominated work; transport and leisure combination (46.5%).

Figure 4.2



CHAPTER FIVE

5.0 DISCUSSIONS

The findings in this report indicate that 43.1% of Hohoe adults (72.9% response rate) were at least 'sufficiently' active on a regular basis within the period of study. More than half the respondents did not meet the minimum requirements of energy expenditure of 600 METs-minutes, the threshold for deriving health benefits from physical activity as described in the literature. This however compares favourably with PA levels elsewhere like the US where the figure is about 26.2% (BFRSS 2000) and 45.4% (2001) in some states¹⁹. The outcome of higher education and income contributing to sufficient energy expenditure was also observed. Higher education was compatible with higher level of physical activity. 61.8% of the 'sufficiently' active respondents had higher than secondary education (45.4% in the US)². 46.1% of the sufficiently active were above minimum wage income earners. A combination of factors such as awareness, affordability and accessibility to LTPA, which the high-income earners are apt to engage in, may contribute to this observation (Tables 4.3 and 4.4).

Males were found to be more sufficiently active than 67.3% than females, 84.6% of who were 'insufficiently' active. The male preponderance is consistent with studies in Brazil where male activity was 41.5% and female inactivity was 80.8% (LTPA)²³. Comparative figures in the US were 34.4% and 34.7% respectively for men and women.²

The higher prevalence of hypertension among females runs at par with their lower levels of physically activity especially in the age-group above 35 years and a further study to find out about the possibility of an association between their lower energy expenditure and cardiovascular diseases will be helpful. The so called lifestyle diseases are highly ranked in the district, and the socio-demographic pattern indicates that even though nearly half the respondents are sufficiently active, traders and self employed persons form the majority of inactive persons, and this is quite significant. The percentage of adults, who obtained the recommended levels of physical activity, as indicated by responses to the questions, was high (43.1%) for several reasons. First, the lifestyle activity questions covered more activity domains (e.g., household, transportation, and leisure-time); rather than only the leisure-time domain, the traditional research interest of physical activity. Second, the lifestyle activity questions attempted to profile the activities in a usual week rather than reporting the top two activities during the preceding month in some studies. Third, the main economic activity, farming (55%) is labour intensive and hardly mechanised, increasing the response to physical activity. Fourthly, the rural orientation and low ratio of motor vehicles/population influenced the physical activity levels. Finally, respondents were asked specifically to recall moderate- and vigorous-intensity activities separately, thereby increasing the potential to recall less intense lifestyle activities.

41.7% of respondents engaged in all four domains of physical activity. The combination of domestic and transport-related activities was very common among women (93.1%) – table 4.6

The low response to leisure-time physical activity would have skewed the findings in favour of 'insufficiently active' population if that had been the only domain assessed as had been the practice until recently.

Less than half of respondents (43.1%) in the Hohoe district however engaged in physical activities consistent with the recommendation of a minimum of 30 minutes of moderate-intensity activity on most days of the week. Overall, a differentiated picture emerges if the different intensities of physical activity (vigorous, moderate, walking), and the caloric expenditures (calculated in MET minutes per week) are compared.

Most people who exercise or join the 'Keep Fit' clubs do so without undergoing medical screening. The clubs also lack qualified or trained physical instructors to take patrons through appropriate physical fitness protocols. They lack emergency equipment to handle any exigencies that may arise out of their activities. Even though none reported any fatality, a few incidents that have occurred make the leadership accept the need for more assistance to be accorded them.

The foremost needs of the fitness clubs is a regulatory body to be put in place, the training of physical instructors and assistance with equipment and periodic training programmes to facilitate their contribution to the health delivery system.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

The study generated data on physical activity patterns and levels in the Hohoe district and also showed a sufficiently active population (43.1%), who engage in physical activity above the recommended energy expenditure of 600METS-min/week. The male preponderance in physical activity was noted to be consistent with findings elsewhere in the literature. The higher prevalence of hypertension among females runs at par with their lower levels of physically activity especially in the age-group above 35 years and a further study to find out about the possibility of an association between their lower energy expenditure and cardiovascular diseases will be helpful. The so called lifestyle diseases are highly ranked in the district, and the socio-demographic pattern indicates that even though nearly half the respondents are sufficiently active, traders and self employed persons form the majority of inactive persons, and this is quite significant.

The limitations imposed by lack of sporting facilities, poor economic conditions and lack of Public Health interest (but concern) in physical activity also restrict the activities of the fitness clubs to a few of the otherwise wide spectrum of services and collaborations in health they can potentially offer.

The dichotomous position that physical activity occupies makes it difficult to source appropriate support from mainstream governmental agencies (health or sports?) for its promotion. The main barrier to the development of research seems

to be the uninformed or partially informed attitude of members of the public and decision makers regarding the role and value of recreation in society.

Physical activity promotion in Ghana is more of a fanciful pastime than a Public Health issue. So these days it is not uncommon to see several persons on the streets struggling through with what they think will enhance their lives in whatever way. But these protagonists of health deserve as much direction and guidance as those at risk of falling victims to the numerous other conditions receiving so much support both locally and internationally. There is no state policy on physical activity and health in Ghana as exists elsewhere like the US with the President's Council on Physical Activity

Against this backdrop the sports delivery network finds it economically and politically 'profitable' to promote elite sport at the expense of Physical Education (PE) and 'sport for all' community projects.

6.2 RECOMMENDATIONS

The interest and the database that the study generated can only form the bedrock for further research and elucidation of physical activity in intervention surveillance studies in the district. The District Health Directorate continues to demonstrate a tremendous zeal and capacity to deal with the numerous public health problems that bedevil the district and seems poised to embrace the integration of physical

activity as a public health concern. In addition, the 'Keep Fit' clubs are ready to partner the district health directorate to serve as catalysts for the general improvement of health and promotion of wellness. But their ability to do so may only be realized if they are accorded a community-based organization status and their capacity building improved.

From the foregoing there is the need to examine critically, the spontaneity of participation that fitness clubs provide in health promotion activities. It is also important to recognise the community orientation of the 'Keep Fit' club concept and accord it the needed support in public health programmes. They probably provide one of the best instruments for change in tackling lifestyle diseases and in fact preventable communicable and non-communicable diseases if the benefits of physical activity are well appreciated.

It is also recommended that any intersectoral collaboration aimed at health promotion must include the 'Keep Fit' clubs. Thus strategies need to be adopted to encourage people to make use of the other domains acknowledged as providing equally good measure of achieving the recommended level of adult physical activity and hence physical fitness.

The upsurge of certain lifestyle diseases like hypertension, which is the second highest cause of morbidity in the adult population in the district, and diabetes demands that the public health unit needs to re-orientate its activities to include the

dissemination of information, education and communication on the benefits of physical activity. In particular it will be desirable for health workers in the district to have adequate knowledge by way of further training on the role of physical activity in preventive health, including communicable diseases and even so importantly in people living with HIV/AIDS, since it helps boost the immune system.

The district assembly must as matter of urgency incorporate the provision of recreational/sporting facilities in its developmental plans. This will encourage and provide a useful pastime which would otherwise be spent at the various drinking bars which dot almost every nook and cranny of Hohoe and where huge volumes of alcohol are dispensed daily, an observation which will hardly be missed by the visitor and only marred by the friendliness of the people.

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ABSTRACT

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APPENDIX 1
IPAQ Scoring Protocol (Short Versions)
Categorical Score- three levels of physical activity are proposed

1. Inactive

- No activity is reported **OR**
- Some activity is reported but not enough to meet Categories 2 or 3.

2. Minimally Active

Any one of the following 3 criteria

- 3 or more days of vigorous activity of at least 20 minutes per day **OR**
 - 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day
- OR**
- 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

3. HEPA active

Any one of the following 2 criteria

- Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week **OR**
- 7 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week

Continuous Score

Expressed as MET-min per week: MET level x minutes of activity x events per week

Sample Calculation

MET levels MET-min/week for 30 min episodes, 5 times/week

Walking = 3.3 METs $3.3 \times 30 \times 5 = 495$ MET-min/week

Moderate Intensity = 4.0 METs $4.0 \times 30 \times 5 = 600$ MET-min/week

Vigorous Intensity = 8.0 METs $8.0 \times 30 \times 5 = 1,200$ MET-min/week

TOTAL = 2,295 MET-min/week

Total MET-min/week = (Walk METs*min*days) + (Mod METs*min*days) + Vig METs*min*days)

APPENDIX 2

QUESTIONNAIRE FOR FITNESS CLUBS

1. What are the aims / objectives of your club? Tick one or all as appropriate

- Fitness
- Rehabilitation after injury/illness
- Disease Prevention
- Other (Specify) _____

2. What activities/services do you offer?

- Exercise programmes
- Health talk/lecture
- Nutritional advise
- Weight Control
- Other (Specify) _____

3. Occupation of patrons NUMBER

Public Servant

Self Employed/Trader

Farmer

Other

TOTAL

4. Gender Distribution NUMBER

Male

Female

5. Do you screen the health status of your members?

YES NO

6. If yes, do you have a standard questionnaire for prospective patrons?

YES NO

7. Personnel / Instructors

Trained

Untrained

8. Equipment

Specify _____

9. Medical Aid / Assistance

YES NO

Specify

10. Have you observed or experienced any injury/disease situation as a result of physical fitness??

YES NO

Specify? _____

11. What did you do if yes to 10?

12. Do you think there are differences in the level of fitness between those who patronize keep fit clubs and those who do not (i.e. engage in other forms of physical activity like walking, doing household chores etc)?

YES NO

Give reasons _____

13. Would you consider legislation to regulate the activities of the keep fit Clubs?

YES NO

14. What is the most important thing do you think can be done to improve the concept of Keep Fit Clubs?

Facilities

Equipment

Personnel

Finance

Other

15. Who should be in charge of Keep Fit Clubs?

Ministry of Health

Ministry of Education, Youth & Sports

Special Body e.g. Presidents Council on Physical Fitness etc

