ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

MEASURING LEVELS OF PHYSICAL ACTIVITY AMONG ADULTS IN MISKAN AND MAREKO DISTRICT: A VALIDATION STUDY

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN PUBLIC HEALTH

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DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for this thesis have been duly acknowledged.

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DEDICATION

To residents of Alamata, Kobo, Wajja, and Korem; and staff of Alamata Zonal Hospital - Tigray.

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ABBREVIATIONS

BMI :	Body Mass Index
BRFSS :	Behavioral Risk Factor Surveillance System
CSM :	Communication and Social Mobilization
CVD :	Cardiovascular Diseases
EPI info :	Epidemiological Information (A word processing, data base and statistics program for public health)
GPAQ :	Global Physical Activity Questionnaire
IPAQ :	International Physical Activity Questionnaire
IQR :	Interquartile Range
KII :	Key Informant Interview
LTPA :	Leisure Time Physical Activity
MET :	Metabolic equivalent
NCDs :	Non- communicable Diseases
NIDDM :	Non Insulin Dependant Diabetes Mellitus
SNNPRS :	Southern Nations Nationalities and People's Regional State
SPSS :	Statistical Program for Social Sciences
Unicef :	United Nations International Children's Fund
WHO :	World Health Organization

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Abstract

According to a substantial body of evidence, regular physical activity can bring significant health benefits to people of all ages and abilities. Scientific evidence increasingly indicates that physical activity can extend years of active independent living, reduce disability and improve the quality of life of young and older adults. Despite these evidences, little is known about physical activity or its measurement on a population basis.

A cross-sectional community based study was conducted to assess reliability and validity of instruments for measuring levels of physical activity. The instrument with better reliability and validity was used to measure levels and assess determinants of physical activity.

Simple random sampling was carried out to recruit a total of 940 subjects. Global Physical Activity Questionnaire (GPAQ) and International Physical Activity Questionnaire (IPAQ) were administered to all participants during the first contact. The questionnaires were administered again after 4 days to a randomly selected sub-sample of 151 participants in order to assess reliability. Validity of the questionnaires was assessed on another randomly selected group of 186 study participants who wore motion monitor for seven consecutive days.

A set of reliability tests indicated that GPAQ and IPAQ had good repeatability; balance in favor of the former. Validity of the questionnaires was assessed by a number of methods. Unlike reliability, validity was modest: percent correctly classified by concurrent validity of GPAQ against IPAQ for various domains of activity was between 35.9 and 42.5; gross

misclassification was in the range 17.7-26.3%. In criterion validity test of the questionnaires against motion monitor, percent correctly classified was between 21.0 and 35.5 for GPAQ and between 25.3 and 38.2 for IPAQ; gross misclassification was in the range of 21.1-40.3% for GPAQ and 18.3-41.9 for IPAQ. The prevalence of physical activity measured by GPAQ was found to be 77%(724/940).

Cumulative assessment of reliability and validity of questionnaires used in this study indicated that GPAQ and IPAQ were appropriate for use in our setting. However, conducting similar reliability and validity studies across different seasons and regions is strongly recommended before applying them on large-scale studies.

Background and Statement of the Problem

Nowadays evidences are coming to suggest the changing nature of health care and threats to good health. The very success of the past few decades in infectious disease control and reduced fertility are inexorably generating a "demographic transition". This coupled with changing patterns of consumption, particularly of food, alcohol and tobacco leads to a "risk transition". This trend of "risk transition" is particularly serious for many low and middle-income countries, which are still dealing with the traditional problems of poverty, such as under nutrition and infectious diseases (1,2).

The Non-communicable Diseases (NCDs) are the new pandemics of the 21st century. They threaten to take millions of lives and drain the meager health care resources of many countries (3).

Globally, there is a pressing need to initiate national programmes aimed at the prevention of NCDs and reducing their enormous social and economic costs. As a preliminary phase of such programmes, national health authorities should promote the collection of data on the magnitude, distribution, determinants and impact of NCDs (4).

Decades of research, involving all major types of biomedical investigation, have conclusively shown that modern "disturbances of human culture", operating from early childhood onward, are responsible for the epidemic of atherosclerotic diseases. These disturbances include a "rich" diet associated with elevated levels of blood pressure,

serum cholesterol and body weight as well as high prevalence of diabetes, the 20th century mass habit of cigarette smoking and sedentary lifestyle (5).

Very little is known about physical activity on a population basis. With few exceptions, physical inactivity as a risk factor for NCDs has not been adequately evaluated (4). The US Surgeon General has declared that sedentary lifestyle is "hazardous to your health", and estimated sedentary living to be as dangerous to one's health as smoking a pack of cigarettes a day (6).

Chronic diseases such as cardiovascular diseases, colon and breast cancers, diabetes, osteoporosis, arthritis, obesity and mental illnesses are found to be linked to physical inactivity. Increasing physical activity often reverses these conditions to some degree (7).

Regular physical activity is important for maintaining muscle strength, joint structure, joint functioning, and bone health. It also appears to protect against falling and fractures among the elderly, probably by increasing muscle strength and balance (8).

Extent of the problem of physical inactivity around the world has been difficult to assess especially in epidemiological studies involving large number of subjects (9). Relatively few countries around the world have included physical activity as part of their national health surveys. Countries that do assess physical activity use a variety of definitions and questionnaires. Thus there is an urgent need for greater degree of global standardization in definitions and assessment (10).

Ethiopia, like most African countries, has many tribal groups originating from different physical environments, with variable literacy, cultural background and lifestyle. It has therefore, sociologically and economically complex society, comprising hunter-gatherers, rural populations living on subsistence farming, and rapidly growing semi-urban and urban populations with lifestyles varying from nearly rural to western type. This influences the type of activities and the method of transportation. Occupation might differ in type and intensity, as a result of seasonality and, because of low salary levels, people being dependent on having more than one job. Therefore, unlike westernized countries where the main difference in energy expenditure is mostly attributable to Leisure Time Physical Activity (LTPA) (11) we expect the physical activity of our study participants to be much more variable and hence worth measuring the levels.

The measurement of levels of physical activity calls for an instrument that is reliable, valid and culturally appropriate. In an attempt to respond to this need this study aimed to test the reliability and validity of interviewer-administered questionnaires – Global Physical Activity Questionnaire (GPAQ) and International Physical Activity Questionnaire (IPAQ) that measure occupational, travel and LTPA in terms of hours or minutes per week.

This study, by virtue of contributing towards the development of reliable and valid instruments for measuring levels of physical activity, will serve both scientific and policy/program development function.

Literature Review

Epidemiological Transition

The morbidity and mortality burden attributable to Non-communicable Diseases (NCDs) such as Cardiovascular Diseases (CVDs), cancer and diabetes is on the increase. In 1990, morbidity attributed to NCDs was 41% of the overall disease burden worldwide, and is projected to be 60% by the year 2020 (12).

Non-communicable Diseases (NCDs) have traditionally been regarded as a problem only of the industrialized countries. However, a rapid health transition is taking place in the developing world (13).

Developing countries are experiencing dramatic changes in the health needs of their populations. This trend will continue and by the year 2020, NCDs are expected to account for seven out of every ten deaths in the developing countries, compared with less than half today (14). The change is partly due to success in the control of infectious diseases and demographic changes, but is also a consequence of change in lifestyle that leads to increased risk of NCDs (15,16).

In 1990, NCDs and injuries accounted for 28% of morbidity and 35% of mortality in Sub-Saharan Africa (5). If communicable diseases control programmes attain their goals, these figures will rise to 60% and 65%, respectively by 2020. If those goals are not achieved and communicable diseases persist, almost 50% of morbidity and mortality will be attributed to NCDs.

"Epidemiological transition" is taking place in part because of the rapid aging of the developing world's populations, progressive urbanization and socioeconomic transformation. Another major factor involves changes in nutritional patterns experienced over the past few decades. As diet changes, usually to include a smaller proportion of complex carbohydrates and more sugar and animal fat, people become more susceptible to NCDs. Obesity becomes more prevalent and, coupled with less physical activity, it increases the risk of morbidity and premature death, particularly from CVDs and diabetes (5). Life style modification is the foundation for the prevention of NCDs and their complications and the basis of any intervention programme aimed at primary prevention. Intervention programmes should aim at promoting healthy lifestyles, particularly in the areas of tobacco use, dietary patterns, and physical activity, and to reduce the risk factors in the community for CVDs, Non-Insulin Dependent Diabetes Mellitus (NIDDM) and certain types of cancer (17).

Physical Activity

Physical activity is a complex behavior that encompasses such disparate domains as sports and exercise, occupational tasks, and household chores. In the broadest sense, physical activity refers to any bodily movement produced by skeletal muscles that results in energy expenditure (18). Sedentary life style (physical inactivity) on the other hand is defined as engaging in no leisure-time physical activity (exercises, sports, physically active hobbies) in a two-week period (19).

Regular physical activity, fitness, and exercise are critically important for health and well being of people of all ages. Research has demonstrated that virtually all individuals can benefit from regular physical activity, whether they participate in vigorous exercise or some type of moderate health-enhancing physical activity (20).

Physical inactivity can have serious implications for people's health, said the World Health Organization on the occasion of World Health Day, 2002. Approximately 2 million deaths per year are attributed to physical inactivity, prompting WHO to issue a warning that sedentary lifestyle could very well be among the 10 leading causes of death and disability in the world (21).

Sedentary lifestyle increases all causes of mortality, doubles the risk of CVDs, diabetes, and obesity, and increases the risks of colon cancer, high blood pressure, osteoporosis, lipid disorders, depression and anxiety. According to WHO, 60–85% of people in the world – from both developed and developing countries – lead sedentary lifestyle, making it one of the more serious yet insufficiently addressed public health problems of our time. It is estimated that nearly two-thirds of children are also insufficiently active, with serious implications for their future health (21).

In a 1993 study, 14 percent of all deaths in the United States were attributed to activity patterns and diet (22). Another study linked sedentary lifestyle to 23 percent of deaths from major chronic diseases (23).

Dr. Gro Harlem Brundtland, former WHO's Director-General said, " We should all be ready to move for health and to adopt healthy and active lifestyles. World Health Day 2002 is a call for action to individuals, families, communities, governments and policy-makers to move for health". In addition to individual lifestyle changes, governments and policy makers are also recommended to "move for health" and create a supportive environment for people (21).

Population studies on other continents (out side Africa) have demonstrated the protective effect of physical activity in the primary prevention of diabetes and CVDs (24). Evidence to support or disprove this assumption is lacking in African populations. Where available, conclusions are mostly based upon self-assessment of activity level and classification into broad activity groups, and more recently a 7-day recall of activity (25,26). Studies of physical activity in these populations were not mainly designed to address epidemiological purposes, some attempted to compare measurement instruments or measure interseasonal variation (27,28). Therefore, there is a need for accurate epidemiological assessment of physical activity with regard to the rising burden of NCDs in these populations.

Measuring levels of physical activity

As with other complex behaviors, such as dietary intake, physical activity is a complex behavior of many interrelated dimensions that is difficult to measure with out bias. Over the past decade developments in the methodology of physical activity assessment have

paralleled increased interest in understanding the role of physical activity in disease prevention and health promotion (6,29).

More than 30 different techniques are available for assessing physical activity, classifiable into seven major categories: calorimetry, job classification, survey procedures, physiological markers, behavioral observation, mechanical and electronic monitors, and indirect dietary estimates (30).

The question of most appropriate method of population-based study of physical activity has been extensively debated, (30,31) and questionnaires are the best consensual method for this purpose (30).

The complexity surrounding the assessment of frequency, duration, type, and intensity has led to a large number of different surveys and questionnaires. These instruments vary in their structure, question order and wording. Many of these questionnaires have been validated in various parts of the world, however socio-cultural differences require the development and validation of specific questionnaire to be used in different populations (32,33). These specificities also need to be taken into account when designing a valid internationally agreed questionnaire, which would allow for cross-country comparisons of epidemiological studies (34). To-date, there is no consensus on the best available questionnaire.

Global Physical Activity Questionnaire (GPAQ) has been developed by WHO as part of the WHO STEPwise Approach to Risk Factor Surveillance. It builds on the experience of the International Physical Activity Questionnaire (IPAQ) and incorporates a combination of elements from the short and long versions of IPAQ (31).

Reliability and validity of instruments for measuring levels of physical activity

The adequacy of a measuring instrument is determined by its reliability and validity. Two fundamental questions should be asked when selecting a measuring instrument. First, does the instrument measure a variable in a consistent way? And second, is the instrument a true measure of the variable? The first is an indication of reliability while the second raises the issues of validity (35).

Reliability refers to the reproducibility and consistency of the instrument and the degree to which it is free from random error. There are several criteria that should be assessed before an instrument can be judged reliable. These include test-retest, inter-rater reliability and internal consistency. Validity is an assessment of whether an instrument measures what it aims to measure. It should include at least standards of face, content, criterion, construct both convergent and discriminant and predictive validity (36).

NCDs are eminent threats to good health in developing countries. The problem has to be addressed from various angles of which one is the development of reliable and valid instrument for measuring levels of physical activity – proxy inidicator of the magniturde of the problem.

Objectives

General Objective

To assess reliability and validity of questionnaires for measuring levels of physical activity among adults in Butajira District.

Specific Objectives

1. To assess reliability of Global Physical Activity Questionnaire and International Physical Activity Questionnaire.
2. To assess validity of GPAQ and IPAQ against each other and against an objective measure of physical activity - motion monitor.
3. To measure levels of physical activity among study population by using the instrument with better reliability and validity.
4. To identify determinants of levels of physical activity.

Methodology

Study Area

The study was conducted in Miskan and Mareko District, Gurage zone, Southern Nations Nationalities and Peoples Regional State (SNNPRS), Ethiopia. Miskan and Mareko District is the place where the Butajira Rural Health Programme of the Department of Community Health, Medical Faculty – Addis Ababa University has the database established in 1986 to generate health related information based on a system of continous registration of vital events and specific studies. The area is located 130 kms south of Addis Ababa.

Study Design and Period

The study followed primarily a cross-sectional design. It was supplemented by Key Informant Interviews (KIIs). This descriptive community-based survey was conducted between September 2003 and January 2004.

Source Population

Persons 18-65 years of age residing in ten Kebeles (smallest administrative unit) - one urban and nine rural - in Miskan and Mareko District constituted the source population.

Study Population

A sample of the source population with 404 urban and 536 rural residents constituted the study population. Study subjects represented both sexes, differing levels of socioeconomic status. In order to avoid overrepresentation of either of the sexes, one

male and one female were selected from respective households by lottery draw. Taking into account the limited resources we had 1-2 more visits were made to each household in an effort to include all eligible candidates in the study, whenever study subjects were not found during the first visit.

Sample Size and Sampling Technique

Assumptions made in sample size calculation were:

- prevalence of physical inactivity of 70% (p=0.7, q=0.3)
- confidence interval of 3% (d=0.03)
- confidence level of 95% ($Z_{\alpha/2} = 1.96$)

$$n = \frac{Z^2_{\alpha/2}\, pq}{d^2} = 896$$

For possible non-response during the actual survey the final sample size was increased by 5% to n = **940**

Simple random sampling method was carried out to select study subjects from the source population.

NB: WHO reports prevalence of physical inactivity in the range of 60–85% in both developing and developed countries (21).

Inclusion criterion

All 18-65yrs old members of the source population were illegible for the study.

Exclusion criteria

Candidates were exempted for any one or more of the following reasons :

- unwillingness to participate in the study
- serious medical condition at the time of survey
- hearing or visual impairment
- gross physical disability (no leg(s) or arm(s))

Survey Instruments

Three modalities of data collection were used in the study. These were interviewer-administered questionnaires, key-informant in-depth interviews and measuring equipment.

Questionnaires

Global Physical Activity Questionnaire (GPAQ) and International Physical Activity Questionnaire (IPAQ) were the questionnaires used for data collection. GPAQ and IPAQ are standardized and pretested structured questionnaires, which are interviewer–administered and thus allow for the literacy level expected in the target population, and the standardization of data collection. Major physical activities – occupational, travel and leisure time – were surveyed by the questionnaires. GPAQ has 19 questions and IPAQ 7 questions that deal with type, intensity, frequency and duration of habitual and past seven days activities, respectively. The questionnaires were organized in such a way that those

used during the first contact have face sheet for compiling socio-demographic information (Annexes III-VI).

Key Informant Interviews

A set of semi-structured questions that focus on type, freqency, duration and intensity of common physical activities of the population were developed before and refined during the period data was collected using the questionnaires (Annex VII). Three key-informants who speak Amharic (common language for the investigator and key-informants), lived in the area for long period of time and had history of good rapport with previous interviews (for other surveys) were identified, requested for and gave their consent. The Key-informant interviews were all moderated by the investigator, assisted by a person who was supervising enumerators during data collection. The KIIs were carried out with the aim of supplementing data and validating findings of the survey. To that end, items not adequately addressed by the questionnaires were identified during data collection and were given due emphasis when the guide for KII (Annex VIII) was refined.

Equipment

Measuring equipment included weighing scale, height measuring board, and motion monitor.

Translation and pretest of GPAQ and IPAQ

The GPAQ and IPAQ were translated from the original English version to Amharic (official language spoken by majority of the population of Ethiopia) and then translated back to English by independent translator to check the validity of translation. Culturally

appropriate examples of different types of physical activity were inserted as part of activities to adapt it to the setting in Ethiopia in general and to that in Butajira in particular.

The pre-final draft instruments were reviewed to check that the meaning of each question and prompt are consistent with the original and were pretested on a small group of people representing the different strata of interest before use in the main study. During the pretest it was learnt that the questionnaires were acceptable and understood by the population. Modifications, which mainly had to do with linguistic clarity, were made and incorporated in the final instruments.

Training of Enumerators and Supervisors

Twenty enumerators (10 male and 10 female) and three supervisors recruited locally to ensure common cultural background with the local community were trained in the administration of GPAQ and IPAQ and in the use of weighing scale, height measuring board and motion monitor. All enumerators and supervisors had completed secondary school, most were experienced in conducting surveys, and had demonstrated the ability to conduct the interview with reasonable adequacy. Standardized training (two-days long) was given on 'questionnaire administration and use of measuring equipment'. Guideline prepared by the investigator was used to facilitate the training. On the first day the questionnaires were discussed (based on the guideline provided to the trainees) and the second day was dedicated to role-play sessions (closely supervised by the investigator and principal advisor). That was followed by one-day pretest with further opportunity to practice interviewing and use of prompts, weighing scale, height measuring board and

motion monitor. All instruments were pretested in the neighboring kebeles (out side the study area).

Data Collection

Both quantitative (survey questionnaires and measuring equipment) and qualitative (KII) methods were used for data collection. Quantitative data was collected using structured questionnaires (GPAQ and IPAQ) and equipment for measuring weight, height and physical activity (motion monitor) through house-to-house visit. Qualitative data was collected after quantitative data collection had been completed. KII guide was used to facilitate the interviews.

Sequence of administration

The test instruments (IPAQ and GPAQ) were administered prior to the assessment by the reference measure. Subjects would normally, in the course of the main investigation in which the test measures were to be used, encounter them independent of any other assessment, and the validation process was made to mimic that. Completing the assessment using the reference measure might in itself draw respondents' attention to their physical activity and thus the sequence of administration followed in this study had the added value of controlling such influences.

The sequence of administration of GPAQ and IPAQ in the reliability study was such that participants in whom the questionnaires were administered in GPAQ-IPAQ order (n=76) during the initial visit were reinterviewed in the same order during the repeat visit. For

those who did the first interview in the reverse (IPAQ-GPAQ) order (n=75) the same order was kept during the second interview.

Time frame of reference method

Assessment of physical activity by both the test instruments (GPAQ and IPAQ) and reference method (Pedometer reading) were made over same number of days (7 consecutive days) to give strength to the method comparison.

Enumerators had 1-3 contacts with study subjects.

- During the first contact GPAQ and IPAQ were administered to every subject.
- For participans of reliability and validity sub-studies a second visit was scheduled four days after the first contact.
- For validity sub-study participants, a third contact was arranged, separated from the second by three days.

First contact

Getting free and informed consent (written consent for those wearing motion monitor and verbal otherwise) constituted the initial step during the first contact. Socio-demographic information was collected as part of the first contact. Subject tracking and equipment forms were also filled, the later only for those wearing motion monitor.

In random order GPAQ and IPAQ were administered and the order of administration was noted on the subject tracking sheet. This helped to follow the same order when re-interviewing respective subjects involved in reliability sub-study.

Random sample of study subjects were made to wear motion monitor for ambulatory monitoring of mobility related activities. They were required to wear the monitor during all waking activities for 7 consecutive days. They were not informed that the interviews (GPAQ and IPAQ) would be assessed against the motion monitor until the interviews were completed. The monitor was attached to the right anterior hip to measure movement of the body. For subjects in the reliability and validity sub-studies, the first contact was concluded by an appointment for second contact (four days later). A relatively short time interval between interviews was chosen to avoid the influence of true changes in the activities carried out by study subjects as well as variation in response which would contribute to reduced reproducibility (37).

Second contact (4 days after first contact)

Both GPAQ and IPAQ were administered in the same order as the first contact to all subjects in the reliability sub-study. In the sub-sample who wore motion monitor, the second contact was used to check compliance and correct use of motion monitor. At the end of the session an appointment for third contact was scheduled for those wearing motion monitor.

Third contact (3 days after the second contact)

During the third contact motion monitor was collected, data from motion monitor downloaded, and subject tracking and equipment forms completed.

Measurement Technique

All study subjects were asked to undergo measurement of body dimensions and those who consented underwent height and weight measurements. Height was measured (shoes and caps removed) using wooden measuring board to which measuring tape with 0.1cm precision was fixed, based on the UN (United Nations) model (38). Weight was measured with participants lightly clothed, using ordinary bathroom scales (100 gm precision for 0 – 150 kg).

Body Mass Index (BMI) was calculated by computer software using the standard Quetlet's formula, weight in Kilograms/height in m^2 (39). Categorization of study subjects into one of five defined categories – malnourished, underweight, normal, overweight or obese was done based on the output (40).

Sample of randomly selected study subjects (balanced by age and sex) were trained in the use of motion monitor (DIGI Walker ^{R} portable instrument - size 7 x 3.8 x 2.2 cm and weight 100gm) and then subjected to objective measurement of physical activity in addition to the filled questionnaires. The monitors are pedometers and detect motion in horizontal plane. When a subject moves, a cantilevered beam in the monitor (supported at

one end) bends and emits a current proportional to the force acting on it. A small computer in the unit then plots an acceleration curve and integrates the area under the curve for the estimation of the amount of physical activity (41). Measurement range lies between 0.01 and 1000 kms.

Participants were instructed to wear the motion monitor at the waist for 7 days, including at least one weekend day. During waking hours, the monitor was fastened to the right anterior hip using belt for males and 2 meters long strap made of linen for females.

Data Quality Control

The three supervisors reviewed all the questionnaires, checked for errors and incompleteness at the end of each day. The investigator rechecked all the questionnaires on the same day and gave feedback the following day before enumerators and supervisors start work. Revisits were arranged to complete information on participants with missing data. Investigator and supervisors also checked if subjects had received proper instruction on the use of motion monitor.

Weighing scales were calibrated every morning using a known weight (plastic container with 5 litters of water) short before enumerators left for fieldwork. Height measuring boards were daily checked to see that the foot rest, bar and pointer are in working condition and measuring tape properly fixed. Motion monitors were checked for proper function and then calibrated before they were fastened to waist of study subjects.

Daily field supervision was instituted during the actual data collection period. Subject and equipment tracking forms were used to maintain accurate records about subject recruitment, contact visits, and completion of data. All questionnaire data and readings from motion monitor were transferred to place of data entry over the weekends.

Variables

Independent variables were place of residence, gender, age, religion, marital status, educational status, occupation, weight and height measurements.

Outcome variables included hours spent on work related physical activity (intense and moderate), travel, leisure time physical activity (intense and moderate), MET-hrs spent on overall activity and reading from motioin monitor.

Data Analysis

Data was double-entered (independently by the investigator and data entry clerk) into EPI Info version 6.04 software and cleaning was done by validating the two entries. The data so collected, entered and cleaned was analyzed by using the Statistical Package for the Social Sciences (SPSS) version 11.01 for windows.

Physical activity calculation : The questionnaires used in this study were designed in such a way that intensity, frequency and duration were computed for each reported activity in terms of hours spent per week on respective activity. Categorization of the number of hours spent on intense and moderate activities (in work, travel, and leisure

domain) as sufficient to benefit health was therefore done based on the following criteria (42):

- intense activity > 90 minutes/week
- moderate activity > 150 minutes/week
- travel > 150 minutes/week
- motion monitor reading > 16 kms/week

The relationship between physical activity and health appears to be a dose-response gradient, any particular level of physical activity is better than a lower level in terms of health benefits. However, these thresholds for 'adequate' activity were chosen, based on epidemiologic evidences, as representing a level associated with a significant reduction in both all-cause mortality and mortality due to diseases such as coronary heart disease, breast cancer and NIDDM (43).

Overall physical activity was expressed in terms of average energy expenditure per week. The average weekly duration of time spent on each activity was computed and the metabolic cost calculated using Ainsworth's Compendium (44). This metabolic cost is expressed as a metabolic equivalent (MET) score which is the ratio of the working metabolic rate divided by the resting metabolic rate. One MET = 1 Kilo cal per Kg of body weight per hour ($Kcal.kg^{-1}.h^{-1}$) and represents the energy expenditure at rest (45). Values of 2.5 and 6 MET were used as energy estimate of moderate and heavy activities,

respectively (44). Estimates of total energy expenditure were computed assuming that the time not reported was spent at resting metabolic rate (1 $Kcal.Kg^{-1}.h^{-1}$).

Taking into account the involvement of study participants in multiple physical activities, the prevalence of physical activity was measured by computing the proportion of study participants who were sufficiently active from at least one of the domains studied.

Missed values : No questionnaire had missing value for more than one item. Few questionnaires (less than five) were found to have missing value in the measurement of hours spent on physical activity of some domain. The items with missing values were exempted in the assessment of the specific domain under consideration.

Percent agreement, chance corrected percent agreement (kappa), Spearman's rank order correlation and Wilcoxon signed rank test were used in the analysis of reliability and validity of the questionnaires. Chi-square, and logistic regression were used in the analysis of determinants of levels of physical activity.

Ethical Considerations

This proposal was ethically cleared by ethical clearance committee of Faculty of Medicine, Addis Ababa University.

Every study subject was asked for free and informed verbal consent prior to interview as well as measurement of body dimensions. Participants selected to wear motion monitor gave written consent.

Enumerators explained to subjects in brief (unless subjects showed special interest) why it was needed to do the study, harmlessness of the procedures, duration of the study and right of study subjects to withdraw at any point in the study period.

The study did not involve any invasive procedure or cause any harm to study subjects.

Results

Socio-demographic characteristics

A total of 940 adults (473 male and 467 female) aged 18-65 years participated in the study. The overall response rate to the questionnaires was 96.6%(940/973). The reasons for non-response were: unavailability in three repeated visits (n=22), refusal to participate (n=8), hearing impairment (n=2) and speech impairment (n=1).

Four hundred and four (43%) of the respondents live in urban while 536(57%) live in rural areas. The median age was 32 yrs (mean=34.4) for males and 30 yrs (mean=32.2) for females. Three hundred and ten (33%) of the respondents were in the age range of 18-25 yrs, 312(33%) fell in the range of 26-35 yrs, and the remaining 318(34%) belonged to age group 36-65 yrs. Six hundred ninety-two (73.6%) of the participants were Muslims, 672(71.5%) were married and 453(48.2%) could not read and write. A look at the occupation of study participants showed that 342(36.4%) were farmers, 198(21.1%) housewives, 190(20.2%) merchants and the remaining 210(22.3%) belonged to other categories (Table 1).

Table 1: Socio-demographic characteristics of study population, Miskan and Mareko District, 2003.

Characteristics (n=940)	%
Residence	
Urban	43.0
Rural	57.0
Sex	
Male	50.3
Female	49.7
Age (yrs)	
18-25	33.0
26-35	33.2
36-45	17.3
46-55	9.7
56-65	6.8
Religion	
Muslim	73.6
Christian	21.0
Others	5.4
Marital Status	
Never married	22.2
Married	71.5
Divorced	1.9
Widowed	4.4
Educational status	
Can't read & write	48.2
Read and write	12.3
Up to grade 6	21.5
Grades 7-12	15.0
College and above	3.0
Occupation	
Farmer	36.4
Housewife	21.1
Merchant	20.2
Student	10.1
Private employee	9.0
Government employee	3.2

Nine hundred and thirty-one (99%) of the participants consented to measurements of height and weight. The mean BMI was 19.54(SD=2.45). Classification of study participants into BMI categories revealed that 277(29.8%) were underweight, and 576(61.8%) were of normal weight (Figure 1).

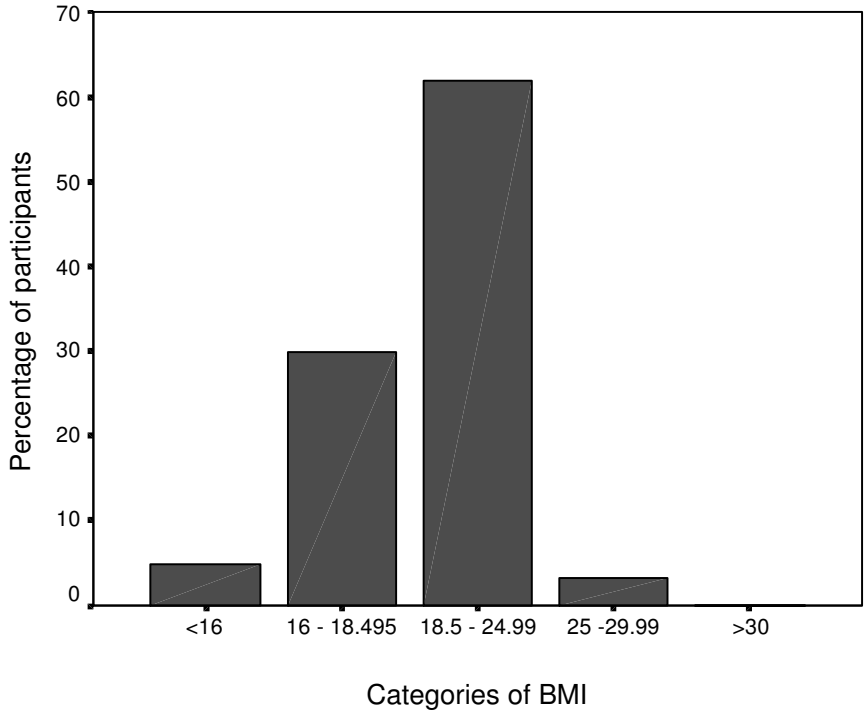

Fig. 1: Distribution of study participants according to BMI, Miskan and Mareko District, 2003.

Reliability sub-study group

A total of 151 randomly selected participants were visited and interviewed for second time according to a pre-arranged appointment. Fifty-five (36.4%) were from urban, whereas 96(63.6%) were from rural areas. The distribution of this sub-study group with

respect to all socio-demographic variables studied except sex was very similar to the main study population. Females were slightly overrepresented (56%)(results not shown).

Validity sub-study group

Hundred eighty-nine subjects were randomly selected for validity sub-study and consented to wear motion monitor. However, three failed to complete - one interrupted due to illness, the second lost the monitor and the third could not wear the monitor for seven consecutive days as the husband locked it and left away. The number of participants in the validation sub-study was therefore reduced to 186. Participants of this sub-study were very similar to the main study population with respect to all socio-demographic variables studied (results not shown).

Reliability sub-study

The dependent variables used to measure the levels of physical activity across various domains were tested for normal distribution before being subjected to reliability and validity tests. They were all found to be significantly different from normal distribution.

For assessment of test-retest reliability, the questionnaires were administered twice (designated as GPAQ1, GPAQ2 and IPAQ1, IPAQ2) at interval of 4 days. Complete percent agreements for various domains of activity measured by GPAQ and IPAQ were in the range 38.7 - 48.0 and 36.7 - 51.7, respectively. In the same assessment percent agreement $\pm$ 1 category was in the range 76.7 - 84.0 for GPAQ and 74.8 - 80.7 for IPAQ. Highest gross misclassification was found for hours spent travelling measured by IPAQ (25.2%) and lowest for measurements made by GPAQ (16.0%). Spearman's rank order

correlations for repeat measurements of various domains of physical activity made by GPAQ and IPAQ were comparable. The values of Spearman's rank order correlations for repeat measurements of overall activity and activity of moderate intensity were lower than other domains for assessments made both by GPAQ and IPAQ (Table 2).

Table 2. Cross-classification of study participants by quartiles, and Spearman's rank order correlations of hrs per week spent on various domains of activity obtained using repeated measurements by GPAQ and IPAQ, Miskan and Mareko District, 2003.

	Correctly classified (%)	Same or adjacent quartile (%)	Grossly misclassified (%)	r_s *
GPAQ1 vs. GPAQ2				
Overall activity**	38.7	80.0	20.0	0.45
Intense activity	47.3	80.7	19.3	0.50
Moderate activity	48.0	76.7	23.3	0.37
Travel	42.7	84.0	16.0	0.53
IPAQ1 vs. IPAQ2				
Overall activity**	43.3	75.3	24.7	0.35
Intense activity	39.3	79.3	20.7	0.51
Moderate activity	36.7	80.7	19.3	0.40
Travel	51.7	74.8	25.2	0.48

* Spearman's rho (all significant at 0.05 level)

**MET-hrs/week, all others hrs/week

Reliability was also assessed by Wilcoxon signed rank test. Data from all repeat measurements, except GPAQs measurements of overall activity, indicated absence of evidence that the medians differ. That, in turn, suggested that both GPAQ and IPAQ had good reliability ($p>0.05$) (Table 3).

Table 3: Test-retest reliability of GPAQ and IPAQ (first and second interviews), Miskan and Mareko District, 2003.

Variable	n*	Median (IQR)		p-value
		GPAQ1	**GPAQ2**	
Overall activity**	150	410(292-835)	313(193-383)	0.00
Intense activity	89	30(18-36)	30(15-42)	0.96
Moderate activity	86	8.5(4-18)	12(6-21)	0.22
Travel	142	7(3.5-14)	6(3.3-13)	0.25
		IPAQ1	**IPAQ2**	
Overall activity**	150	300(239-363)	281(213-347)	0.06
Intense activity	129	20(10-31)	20(8-30)	0.78
Moderate activity	144	8(4-15)	8(4-15)	0.75
Travel	52	7.5(5-14)	7(6-14)	0.30

*number of respondents
** MET-hrs/week, all others hrs/week

Validity sub-study

Concurrent Validity

The agreement between GPAQ and IPAQ in the measurement of MET-hours per week spent on overall activity was visually assessed by Bland-Altman plot. The median difference for overall activity was -2.75 MET-hrs and the interquartile range was between -18.0 and 8.0 MET-hrs. The differences were symmetrically distributed about the line passing through the x-axis (Y=0) (Figure 2).

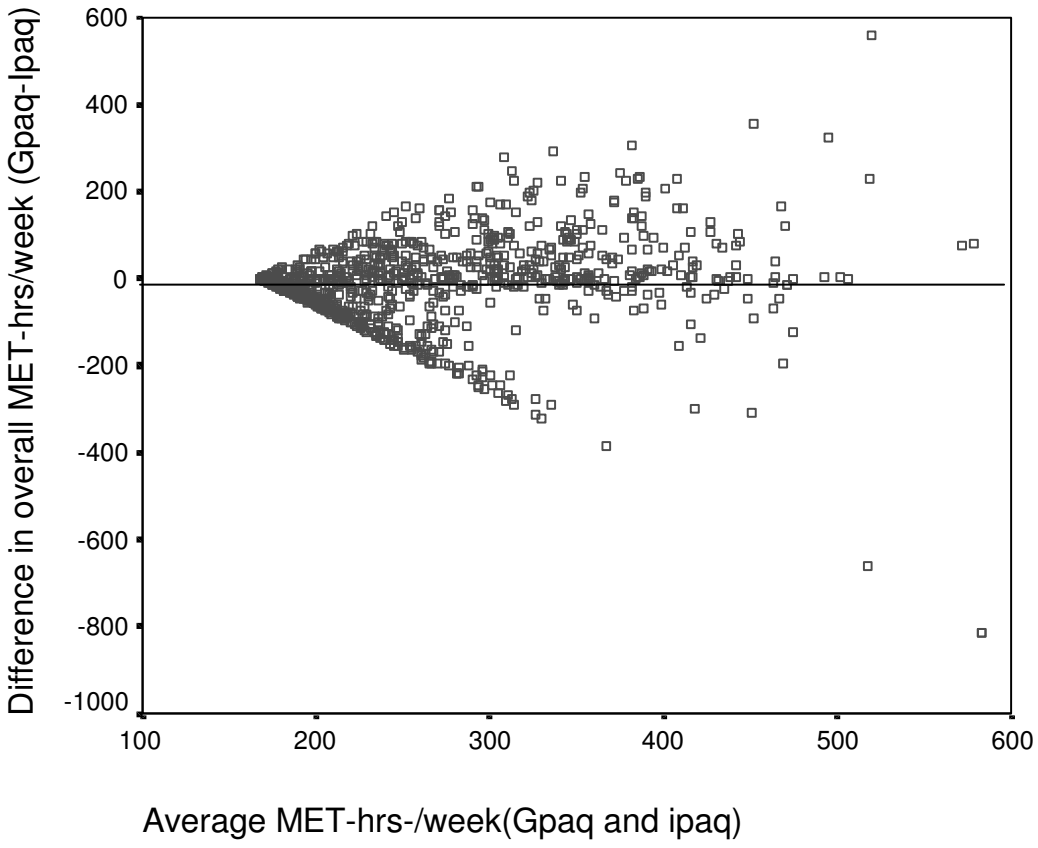

Fig 2. Bland-Altman plot to visually assess agreement between measurements of GPAQ and IPAQ on overall energy expenditure (MET-hours per week), Miskan and Mareko District, 2003.

As part of validity test, the agreement between the questionnaires was checked. It was found that complete percent agreement ranged between 35.9 and 42.5, highest for overall activity and lowest for moderate activity. Percent agreement $\pm$1 category was in the range 64.6-82.3. Gross misclassification was highest in the assessment of hours spent travelling on foot or by bicycle (26.3%) and lowest for intense activity (17.7%). Spearman's rank order correlation was highest for intense activity (0.62) and lowest for overall activity (0.37). Chance corrected percent agreement (kappa) also had the highest value for intense activity (k=0.39) (Table 4).

Criterion Validity

GPAQ against motion monitor

Further validation of hours spent on various domains of activity measured by GPAQ was done against objective measure of physical activity - motion monitor. Complete percent agreement was between 21.0 and 35.5 and percent agreement $\pm$1 category was between 59.7 and 78.9. Spearman's rank order correlations and chance corrected percent of agreement (kappa) for various domains of activity were in the range (–0.07- 0.37) and (0.08-0.17), respectively (Table 4).

IPAQ against motion monitor

Validation of IPAQ against motion monitor showed highest percent agreement for hours spent on intense activity (38.2) and lowest percent agreement for moderate activity (25.3). Similarly, percent agreement $\pm$ 1 category was highest for intense activity (81.7) and lowest for moderate activity (58.1). Proportion of gross misclassification for

moderate activity was 41.9%. Spearman's rank order correlations and chance corrected percent agreement values for domains of activity studied in criterion validity of IPAQ were in the range (-0.15-0.40) and (0.04 -0.22), respectively (Table 4).

Table 4. Cross-classification of study participants by quartiles, Spearman's rank order correlations and chance corrected percent agreement (kappa) of hrs per week spent on various domains of activity obtained using assessments by GPAQ, IPAQ and motion monitor, Miskan and Mareko District, 2003.

	Correctly classified (%)	Same or adjacent quartile (%)	Grossly misclassified (%)	r_{s*}	kappa
GPAQ vs. IPAQ					
Overall activity**	42.5	80.7	19.3	0.37	-
Intense activity	37.1	82.3	17.7	0.62	0.39
Moderate activity	35.9	64.6	25.4	0.43	0.24
Travel	38.8	73.7	26.3	0.44	0.29
GPAQ vs. Motion M.					
Overall activity**	33.5	78.9	21.1	0.37	-
Intense activity	35.5	73.1	26.9	0.33	0.14
Moderate activity	21.0	59.7	40.3	-0.07***	0.17
Travel	28.0	76.4	23.6	0.28	0.08
IPAQ vs. Motion M.					
Overall activity**	34.9	81.5	18.3	0.40	-
Intense activity	38.2	81.7	18.3	0.40	0.22
Moderate activity	25.3	58.1	41.9	-0.15	0.04
Travel	26.9	60.8	39.2	0.23	0.11

* Spearman's rho

** MET-hr/week, all others hrs/week *** not significant at 0.05 level, all others significant

Validity of test instruments across sub-groups

The validity of test instruments in measuring levels of physical activity was further assessed across sub-groups categorized by gender and place of residence. Spearman's rank order correlations were used to look for change across categories. The findings of both concurrent and criterion validation (categorized by gender and place of residence) were comparable to the results of assessment of validity with out categorization, in most domains the later appeared to be average values of the former. Concurrent validity of test instruments (GPAQ vs. IPAQ) and criterion validity of IPAQ were better for rural than urban residents. Criterion validity of GPAQ was better for females than for males (Table 5). Similar assessment of validity was carried out after categorizing study participants with formal education into one group and those without formal education into another group. Concurrent validities were comparable, criterion validity of GPAQ and IPAQ were better for those without formal education (r_s=0.05-0.47 vs.0.01-0.27) and (r_s = 0.18-0.50 vs. –0.17-0.33), respectively (results not shown).

Table 5. Spearman's rank order correlations of various domains of activity cross-classified by gender and place of residence obtained using assessments by GPAQ, IPAQ and motion monitor, Miskan and Mareko District, 2003.

	Urban r_s*	Rural r_s	Male r_s	Female r_s
GPAQ vs. IPAQ				
Overall activity**	0.41	0.49	0.45	0.38
Intense activity	0.49	0.68	0.56	0.56
Moderate activity	0.39	0.45	0.54	0.34
Travel	0.18	0.59	0.39	0.45
GPAQ vs. Motion M.				
Overall activity**	0.36	0.40	0.11	0.13
Intense activity	0.40	0.32	0.05***	0.09
Moderate activity	-0.16***	-0.04***	-0.08***	0.25
Travel	0.29	0.30	0.02***	0.09
IPAQ vs. Motion M.				
Overall activity**	0.24	0.52	0.25	0.20
Intense activity	0.16	0.67	0.26	0.13
Moderate activity	-0.11***	-0.18***	-0.15***	0.10
Travel	-0.09***	0.37	-0.07***	0.05***

* Spearman's rho
** MET-hr/week, all others hrs/week
*** not significant at 0.05 level, all others significantat 0.05 level

Prevalence of physical activity

Assessment of the prevalence of physical activity was made by computing the proportion of study participants who were sufficiently active from at least one of the domains studied. The prevalence of physical activity among study participants was found to be 77%(724/940). Further analysis by gender and place of residence showed that the prevalence of physical activity was 85%(402/473) for males, 69.4%(322/464) for females, 65.3%(264/404) for people living in town and 85.8%(460/536) for those living in rural area. Females were less likely to be engaged in sufficient duration of physical activity from at least one domain [OR= 0.51, 95%CI (0.34-0.79)], whereas rural residents were more likely [OR=3.05, 95%CI (2.01-4.62)] to be involved in sufficient physical activity from at least one of the domains studied. When analysed by level of education the prevalence was found to be 74.7%(277/371) for those with formal education and 78.6%(447/569) for those without formal education. However, the difference was not statistically significant (results not shown).

Distribution of hours spent on various activities

Assessment of habitual physical activity by GPAQ showed that the median hours per week spent on majority of the domains of physical activity studied were higher for people living in rural areas than for people living in town. Similarly, the median hours per week spent on various domains of physical activity were higher for males than for females. The differences were remarkable for MET-hr per week spent on overall activty (Table 6).

Table 6: Distribution of habitual physical activities measured by GPAQ (hrs/week) among study population, Miskan and Mareko District, 2003.

	Urban (n = 404)	Rural (n = 536)	Men (n = 473)	Women (n = 467)
	Median (IQR) [Mean]	Median (IQR) [Mean]	Median (IQR) [Mean]	Median (IQR) [Mean]
Overall activity*	181(171-264) [231]	257(180-352) [277]	284(182-372) [295]	184(171-249) [218]
Work related				
Intense	21(12-36) [25]	24(12-36) [24]	30(18-40) [29]	12(6-21) [15]
Moderate	10(4 -24) [17]	12(6-28) [19]	9(4-20) [15]	18(6-35) [22]
Travel	4(2-7) [6]	6(3-14) [8]	7(3-14) [8]	4(2-7) [6]

* MET-hrs/week, all other values hrs/week

A 69-year old, ex-farmer said, "*People in the area use public transport only when traveling to distant places on market days. In all other instances they travel on foot* ''. In another key-informant interview with a 50-year old farmer it was learnt that people in the area traveled ½ - 4 hours on market days. Men travelled long when attending funeral ceremonies and meetings in distant places. It was common to find people travelling 6 hours to marketplaces. People travelled long during rainy season because they didn't feel thirst or hunger.

Socio-demographic determinants of physical activity

Work related physical activity

Study participants living in rural areas were more likely to be engaged in intense physical activity lasting over 90 minutes/week compared to urban counterparts [OR = 3.54, 95% CI (2.31-5.44)]. Females were less likely to be engaged in sufficient duration of intense physical activity [OR = 0.40, 95%CI (0.26-0.61)]. Participants who belonged to age categories 26-35 yrs [OR = 1.88, 95%CI (1.21-2.91)], and 36-45 yrs [OR = 2.16, 95%CI (1.27-3.67)] were more likely to be engaged in sufficient duration of intense work related physical activity when compared to participants in age range 18-25 yrs. Compared to farmers, housewives [OR = 0.44, 95% CI (0.27-0.72)], merchants [OR = 0.50, 95% CI (0.30-0.83)], and students [OR = 0.33, 95%CI (0.16-0.68)] were less likely to be engaged in sufficient duration of intense physical activity (Table 7).

Table 7. Socio-demographic determinants of sufficient duration of work related intense physical activity among study population as measured by GPAQ, Miskan and Mareko District, 2003

	Work related intense physical activity > 90 min/week		
Characteristics	Population (responded)	%	Adjusted OR (95% CI)
Residence			
Urban	220	51.4	1.00
Rural	385	82.3	3.54(2.31-5.44)*
Sex			
Male	345	82.3	1.00
Female	260	56.2	0.40(0.26-0.61)*
Age (yrs)			
18-25	170	61.8	1.00
26-35	227	72.2	1.88(1.21-2.91) *
36-45	114	81.6	2.16(1.27 -3.67)*
46-55	53	77.4	1.23(0.66-2.29)
56-65	41	65.9	0.93(0.45-1.91)
Marital Status			
Never married	130	64.6	1.00
Married	444	74.5	0.71(0.43 -1.19)
Divorced	11	45.5	0.52(0.15-1.77)
Widowed	20	50.0	0.44(0.16-1.18)
Educational status			
Can't read & write	285	71.6	1.00
Read and write	81	80.2	1.42(0.84-2.39)
Up to grade 6	136	75.7	1.22(0.77-1.93)
Grades 7-12	183	60.2	1.17(0.63-2.18)
College & above	20	40.0	0.67(0.21-2.17)
Occupation			
Farmer	268	90.7	1.00
Housewife	113	52.2	0.44(0.27-0.72)*
Merchant	100	56.0	0.50(0.30-0.83)*
Student	54	46.3	0.33(0.16-0.68)*
Private employee	50	74.0	0.79(0.43-1.44)
Government employee	19	52.6	0.56(0.20-1.60)

* statistically significant

Hours spent travelling

Residents of rural areas were more likely to be engaged in sufficient duration of travel (> 150 minutes /week) [OR = 2.87, 95% CI (1.91-4.31)]. Females were less likely to be engaged in sufficient travel [OR = 0.58, 95% CI (0.39 – 0.87)]. Compared to participants in the age category 18-25 yrs, those between 36 and 45 were more likely to travel on foot or by bicycle for sufficient duration of time to benefit health [OR=1.73, 95% CI (1.02 - 2.92)]. Compared to the illiterate, study participants who could read and write (with no formal education) on one end and those with college and above education on the other end were more than two times likely to travel long enough to benefit health. Marital status was not significantly associated with sufficient length of hours spent travelling on foot or by bicycle (Table 8).

Table 8. Socio-demographic determinants of sufficient duration of travel on foot or by bicycle among study population as measured by GPAQ, Miskan and Mareko District, 2003.

	Travel on foot or by bicycle > 150 min/week		
Characteristics (n = 940)	Population (responded)	%	Adjusted OR (95% CI)
Residence			
Urban	404	93.1	1.00
Rural	536	95.7	2.87(1.91-4.31) *
Sex			
Male	473	96.2	1.00
Female	467	92.9	0.58(0.39-0.87) *
Age (yrs)			
18-25	310	94.5	1.00
26-35	312	93.6	1.33(0.88-2.01)
36-45	163	97.5	1.73(1.02-2.92) *
46-55	91	94.5	0.75(0.42-1.35)
56-65	64	92.2	0.78(0.40-1.53)
Marital Status			
Never married	209	93.8	1.00
Married	672	95.2	0.96(0.58-1.58)
Divorced	18	83.3	0.66(0.23-1.94)
Widowed	41	92.7	1.01(0.42-2.45)
Educational status			
Can't read & write	421	92.9	1.00
Read and write	112	96.5	2.23 (1.38-3.61)*
Up to grade 6	194	96.0	1.04(0.74 -1.46)
Grades 7-12	133	94.3	0.83(0.56-1.21)
College & above	28	100.0	3.67(1.25-10.75) *
Occupation			
Farmer	342	97.1	1.00
Housewife	198	92.4	0.51(0.35-0.93) *
Merchant	190	91.6	1.10(0.66-9.83)
Student	95	97.9	0.83(0.41-1.68)
Private employee	85	87.1	0.69(0.38-1.25)
Government employee	30	100.0	1.44(0.46-4.44)

*statistically significant

Leisure Time Physical Activity (LTPA)

Assessment of leisure time physical activity showed that only 160(17%) of the study participants were involved in some hours of intense leisure time physical activity. For those reporting some LTPA, the median hour per week spent on intense leisure time physical activity was 4.0 and the interquartile range was between 2.0 and 9.0 hrs per week. Two hundred and thirty-seven (25.2%) of the study subjects enjoyed some hours of moderate intensity of leisure time physical activity. The median hour per week was 4.0 and the interquartile range was between 2.0 and 6.0 hrs (results not shown).

Further assessment of leisure time physical activity showed that females [OR = 0.25, 95% CI (0.14-0.47)] were less likely to enjoy sufficient duration of intense leisure time physical activity. Compared to the illiterate, participants who could read and write were more likely [OR = 2.09, 95% CI (1.16 - 3.79)], whereas those with some high school education were less likely [OR = 0.40, 95% CI (0.17 - 0.96)] to enjoy intense leisure time physical activities. Place of residence, age, and marital status were not associated with likelihood of involvement in intense leisure time physical activity (results not shown).

In an interview with the ex-farmer, it was learnt that during dry season males and females went to wedding festivals where they listened to songs. During rainy season males spent leisure time in pubs drinking 'Areki' – locally made hard liqour - and females attending coffee ceremonies. Khat chewing, cigarette smoking and chatting were the predominant means by which youth spent their leisure time, as reported by the key-informant.

BMI and physical activity

Body Mass Index was assessed as a possible determinant of the length of time spent on various domains of physical activity. Compared to malnourished participants, individuals with normal weight were more likely to be engaged in sufficient duration of intense [OR = 2.73, 95% CI (1.18 - 6.31)], moderate activity [OR = 2.37, 95% CI (1.08-5.23)], and travel [OR = 2.70, 95% CI (1.27-5.72)] (results not shown).

Discussion

The questionnaires described in this paper are outputs of the international community, which appreciated the burgeoning global problem of physical inactivity (6,42,46) and the need for population surveillance and inter-country comparisons.

This study tested the reliability and validity of the questionnaires among sub-study group of residents of Miskan and Mareko District. In doing so, the participants for reliability and validity sub-studies were randomly selected and had very similar socio-demographic characteristics to the study population. These similarities would enhance generalizability of study findings to the study and source populations.

Before discussing reliability of instruments used in this study, it is worth noting that assessment of reliability of questionnaires for measuring levels of physical activity is not as simple as repeating measurement in physical sciences i.e. the first assessment of physical activity will affect the second in either direction.

Repeatability of the questionnaires was first assessed by cross-classifying participants by quartiles of hours spent per week on various domains of physical activity. Repeat measurements made by GPAQ correctly classified about half of the participants in three of the four domains of activity studied. Over 75% of the participants were classified into the same or adjacent quartile. These findings suggest that GPAQ is a reliable instrument. Similar assessments of IPAQ gave slightly lower but comparable results. Repeatability of the instruments was further strengthened by the finding that less than a quarter of

participants were grossly misclassified by both instruments. Spearman's rank order correlations of the repeat assessments of individual activities as well as aggregate measure were all statistically significant.

In the paired sample test-retest analysis of Global Physical Activity Questionnaire there was no evidence that the two interviews differed from each other in most domains of activity studied. The repeat assessments of overall activity (an aggregate measure) by GPAQ gave, as could be expected, measurements with median difference which was statistically significant ($p<0.01$).

Like GPAQ, the International Physical Activity Questionnaire had good repeatability across the domains of activity subjected to paired analysis. In all domains of activity studied the differences were not statistically significant.

Factors that contributed to good repeatability of the questionnaires were proper translation and back translation, standardized training and supportive supervision, which would minimize interrater variation, and short test-retest interval, which would minimize true changes in level of habitual physical activity.

Before embarking on the discussion of validity sub-study, it would be worth mentioning that assessment of the true validity of a questionnaire for measuring levels of physical activity would require measuring with high accuracy the habitual activity of free-living individuals by using gold standard over several months and during all seasons. These

were not feasible in this study and thus assessment of relative validity by comparing the questionnaires with each other and with an alternative objective method with its own limitations was chosen.

Bland-Altman plot was made to visually assess agreement between the questionnaires in the assessment of overall energy expenditure. The plot showed that the agreement between the two methods was favorable with all differences symmetrically distributed about the line passing through the x-axis. The symmetric distribution indicated that neither method tended to over or underestimate measurements made by the other questionnaire. The plot also showed that the differences get larger and larger as the number of MET-hours per week spent on overall activity increased. The pattern indicated that the fewer the number of MET-hours per week spent on overall activity, the better was the agreement between the questionnaires.

For concurrent validation, the agreement between GPAQ and IPAQ in labeling individuals as sufficiently active was assessed across domains of activity. Agreement was good as could be seen from high percentages of classification into same or adjacent quartiles (all >64.6%), fair correct classification (all >35.9%) and low gross misclassification (all < 26.3%). Similarly, Spearman's rank order correlations favored interchangeable use of the questionnaires. Values for chance corrected percent agreement (kappa) were poor for some and fair for other categories according to the rule of thumb for evaluating kappa values (47). In relative terms, highest agreement was found in the measurement of hours per week spent on intense activity (k = 0.39) and lowest for

moderate activity (k = 0.24). The persistent finding that both GPAQ and IPAQ had better reliability and concurrent validity when measuring intense physical activity could be attributed to its strenousness, which might facilitate accurate report.

Generally speaking, it is uncommon for two different methods to agree exactly and give identical result for all individuals. However, we can replace one by the other or use them interchangeably if the difference doesn't cause difficulties in the interpretation of method comparison (48).

Criterion validity of GPAQ and IPAQ was assessed against motion monitor by three methods (percent agreement, Spearman's rank order correlation and chance corrected percent agreement). Findings indicated that agreements were modest to fair, balance slightly in favor of GPAQ.

Despite wider use across countries (46), IPAQ was comparatively inferior for use in our setting as it gives little emphasis to individual activities and their intensities. A twelve-country reliability and validity study of IPAQ (52) also indicated that IPAQ can be used with confidence in developed countries or in urban samples from developing countries, but with some caution in rural or low literacy samples from developing countries.

In this study GPAQ had comparable criterion validity for urban and rural sub-groups, whereas IPAQ, unlike the report from the twelve-country reliability and validity study, performed better in rural sub-sample. The fact that this study was conducted in

population predominantly of rural origin and low literacy could partly explain the inconsistent finding.

The data from this study illustrated how different measures of agreement do not necessarily give the same result. The results also showed that the percentages classified into quartiles and correlation coefficients might not everytime correspond closely. As cross-classification can group subjects with widely differing levels of activity into one category and subjects with very similar level into different categories if they are close to the cut-off point, complete agreement between the two approaches should not be expected, particularly in studies with small number of subjects in which misclassification of a few subjects can make a large difference to the percentages. Although kappa is valuable in that it gives a single value to represent agreement, and adjusts for chance agreement, it is useful to present it in association with the percentages, which are intuitively more meaningful.

Due to lack of agreement on the best way of presenting results from validation studies (49,50), it was necessary to use more than one statistical method in order to give credence to the results (51).

In an attempt to build a composite picture of the adequacy of the instruments, subjective assessment of validity was done in addition to statistical analysis. Face validity of the questionnaires was explored through interviews during the pretest. It was found that both GPAQ and IPAQ had good face validity, balance in favor of the former as judged by the

clear presentation of the questions and attention to the various domains of physical activity. GPAQ is a comprehensive questionnaire. It attempts to cover the most important domains of physical activity - occupational, travel, and leisure time physical activity. It also grades them based on their intensities and thus it has adequate degree of content validity. It is also found to be of adequate sensibility to our setting as it is characterized by ease of use and linguistic clarity i.e. questions are structured and easily comprehensible.

Compared with usual physical activity surveillance tools, such as the Behavioral Risk Factor Surveillance System (BRFSS), which measure mostly Leisure Time Physical Activity (LTPA), the instruments used in this study – GPAQ and IPAQ – assess multiple domains of activity in addition to LTPA. This inclusion of multiple domains of activity, however, would lead to higher prevalence rates of physical activity and might compromise agreement with the "gold standard" - motion monitor - which counts only movement of the body against horizontal plane. Regardless of this limitation, a questionnaire targeting developing countries where most of physically active hours are spent outside leisure time will serve its purpose only if it gives more emphasis to other domains of activity namely occupational activities and travel.

Discussion with the interviewers and some of the interviewees, at the conclusion of data collection, revealed that the questionnaires had good acceptance (balance in favor of

GPAQ) and were judged as feasible. The average time taken for interview (25–35 minutes) was not too long to precipitate fatigue.

Taken together, the results suggest that the indices computed from the questionnaires have good reliability and modest validity. The modest validity results in this survey could be partly attributed to the homogeneity of study population with respect to distribution of important variables (age, BMI, labor demanding occupations). The validity of physical activity questionnaires generally cannot be assumed to be independent of the population or the specific context in which the measurements were collected. For example, the correlation between physical activity questionnaire and true habitual physical activity levels (as well as reference measurements eg. pedometer reading) would generally tend to improve if the measurements are collected in a population with greater between-subject heterogeneity in true physical activity and, inversely would be lower in populations with more homogenous activity patterns.

These reliability and validity results are similar to those previously reported for other questionnaires. In a review of available questionnaires, Kriska and colleagues (46) noted how most, but not all, previously published questionnaires were supported by reliability studies and where this was measured, it was almost always high. By contrast, validity was less frequently reported and where it was, it was typically low. Similarly, a study on development and validation of a new self-report instrument for measuring physical activity conducted on 2500 randomly selected Danish men and women (53) had poor correlation between test instrument and accelerometer (r=0.20, statistically non-

significant). One particular problem in the validation of physical activity questionnaires is the choice of appropriate comparison instrument (54).

The validity of self-reported measures of physical activity is difficult to assess directly, since there is no gold standard with which to compare actual free-living activity energy expenditure, particularly for the individual activity domains (30). A seven-day diary repeated every three months for one year would, in theory, accommodate seasonal variation, provide a more accurate reflection of an individual's usual pattern of activity and serve better as a reference measure against which to assess the validity of questionnaires responses (55). This was not applicable to our setting as close to half of the participants couldn't read and write and thus were unable to keep such records. The fact that this study was done in only one season was also an important limitation.

Many physical activity validation studies have used other forms of subjective questionnaire or diary as the validation method. Although this strategy tends to produce higher correlations, the possibility of correlated error is substantial as both the questionnaire under scrutiny and the validation instrument are of the same fundamental type and are subject to the same forms of bias (56-58). It would be preferable therefore, to select an objective non-questionnaire based method as the validation instrument, ideally one with a high agreement with the true exposure of interest (59).

The issues of objective reference measure for physical activity questionnaire validation has been extensively debated. To date the "gold standard" in free-living conditions is the

double-labeled water method (60,61) with which the reference method we used - motion monitor – agrees well. The double-labeled water method is known for its objectivity, minimal interference with the subject's daily activities, accuracy and precision (62).

Jacobs and colleagues in a study reporting analysis of 10 physical activity questionnaires noted that the capacity of a questionnaire to perform well against validation measures does not appear to be solely related to its length and attention to detail. More important seems to be the logic with which questions are constructed (33). In particular they recommended that questions should target specific physical activity domains in the contexts in which people usually perform the target activity. Thus, the logical development and construction of a questionnaire plays a key role in determining its validity. It is therefore appropriate to describe development alongside validation (63).

Overall assessment of reliability and validity of the questionnaires favored GPAQ over IPAQ for use in our setting and thus the following paragraphs discuss the distribution and determinants of various domains of physical activity as measured by GPAQ.

Of special interest in the characteristics of study population is their distribution according to BMI, which is slightly skewed to the left. It might be associated with the grains stock out during the season (pre-harvest) data was collected. A study in Cameroon had similar findings for rural population (BMI $\geq$25kg/m^2 in less than 10% and 2% of women and men, respectively (64).

Unlike studies from both developing and developed countries which reported low prevalence (15-40%) of physical activity (21), very high prevalence was found in our study despite a stringent definition (sufficiently active from at least one of the domains studied). The definition is stringent in the sense that it excluded cases who could have adequate cumulative physical activity to be entitled as sufficiently active and thus it was an underestimation of the actual prevalence of physical activity. Similarly, high prevalence of physical activity was found in a study conducted by colleagues from Jimma University (personal communication). The high prevalence might be explained by the ambulatory nature of occupations of most study participants (farmers, merchants, students). It could also be attributed to inclusion, by the test instrument, of various domains of physical activity with some overlaps.

The distribution of hours per week spent on various activities revealed that both men and women spent much of their physically active hours working and/or travelling and little enjoying leisure time physical activity.

People living in the town and women were less likely to be engaged in sufficient intense physical activity, which could be explained by their lower levels of exposure to farm related activities, which demand intense labor. This could also be accounted for, at least partly, by sedentary nature of their lifestyle.

In a KII it was learnt that the government regime change in 1974 in general and the land re-distribution in particular, had impact on physical activity of ladies. In the old days it

had been a must for women to carry out labor-demanding farm related activities. Following the change that was no longer the case i.e. women were expected to perform less intense activities. Instead, they started to spend much of their time in marketplaces (assuming sedentary style except when travelling to and from market). Some ladies grew vegetables in their backyard and spent much of their time in the vicinity of their homes. In line with this, in another KII it was discussed that men in general and married men in particular (because of the multiple responsibilities they shoulder) did more laborious activities than women. If a husband failed to work as expected then the marriage would be endangered.

Participants aged 26-45yrs were more involved in sufficient intense physical activity which might be explained by the fact that they comprised most of the married people with multitude of responsibilities. Assessment of physical activity across categories of occupation revealed that farmers were more likely to be involved in intense physical activity.

The findings from key-informant interviews and questionnaires were very similar in general and in terms of the number of hours spent travelling and the differences across gender in particular. Men were more likely travel sufficient duration to benefit health, which could be explained by their distant travels when attending funeral ceremonies and meetings. This similarity in findings, by way of triangulation, strengthened the validity of instruments used.

Participants with normal weight were more likely to be engaged in sufficient duration of various domains of physical activity. This might be a reflection of presumed better health status and thus increased involvement in various activities.

Participants of the study generally spent very little time on leisure time physical activity. The proportion of participants who enjoyed leisure time physical activity and the number of hours per week spent on leisure time physical activity (moderate and intense) were small. When looked into sub-groups men were more likely to enjoy sufficient duration of leisure time physical activity than women. This might be attributed to the tendency of women to spend much of their leisure time (in relative terms) around their homes performing seemingly physically non-demanding activities (caring for children, preparing meals and other household chores).

The physically demanding nature of the occupation of most of study participants coupled with lack of arrangements for physically demanding pastimes might have left them with little interest to be engaged in intense and moderate leisure time physical activity. The low proportion of people being involved in leisure time physical activity and the few hours they reported could also be accounted for by their preference to sedentary pastimes. Key-informants emphasized the practice of spending leisure time chewing Khat, chatting, and attending coffee ceremonies.

In the rapidly growing cities of the developing world, crowding, poverty, crime, traffic, poor air quality, lack of parks, sidewalks, sports and recreation facilities and other safe

areas make physical activity a difficult choice. Even in rural areas of developing countries sedentary pastimes such as watching television are increasingly popular (61).

Cumulative assessment of reliability and validity of questionnaires used in this study indicated that GPAQ and IPAQ were appropriate for use in our setting. Taking into account clarity, sensibility, and comprehensiveness as additional subjective criteria for selection, and the low literacy level of target population, GPAQ was found to be superior.

Conclusions

GPAQ and IPAQ provided inexpensive and reliable methods (with modest validity) for measuring levels of physical activity in the setting where this study was carried out.

The level of agreement between the questionnaires was good. This would favor interchangeable use as dictated by the setting. The level of agreement between the questionnaires on one hand and motion monitor on the other hand was modest and would call for use of better validation instrument and/or aids during interview to facilitate accurate reporting of hours spent on various categories of physical activity.

Given clarity, sensibility, brevity, comprehensiveness and ease of administration for people with low level of education – GPAQ was found to be superior to IPAQ in the setting the survey was conducted.

The prevalence of physical activity among the study population, assessed by use of GPAQ, was found to be very high. Study participants spent much of their physically active hours on duty and/or travel. Few people had the habit of leisure time physical activity and very little time was spent on physically demanding leisure time activity.

Strengths of the study

The high overall participation rate indicated appropriateness of the instruments to the setting. The use of key-informant interviews augmented the survey, by providing information, which was otherwise inaccessible.

Randomly selected participants from urban and rural areas with various socio-demographic characteristics were involved in the reliability and validity sub-studies thus allowing greater degree of generalizability of findings to the study and source populations. Generalizability was further enhanced by marked resemblance between the sub-study groups and study population in a number of socio-demographic characteristics of interest to the objectives of the study.

The instruments used are known for their appropriateness in settings of both developing and developed countries. In the process of adapting them to our specific setting the questionnaires were translated to local language and locally appropriate descriptions were added without violating content of the questionnaires.

To our knowledge, this is one of the few validity studies done in Ethiopia and is a pioneer in the validation of instruments for measuring levels of physical activity. The study alerts scientific community and policy makers on the growing importance of physical inactivity (on top of existing health problems) as a risk factor to the otherwise neglected non-communicable diseases. The study besides making available a yardstick for measuring levels of physical activity, would serve as a baseline for future works in the field.

Limitations of the study

The reliability and validity sub-studies were done simultaneously with the descriptive study. It would have been ideal to complete first the reliability and then the validity sub-study before implementing the instruments on such huge number of participants. Despite the fact that assessment of levels of physical activity across various seasons gives comprehensive picture, this study was done in only one season (pre-harvest). We couldn't comply with those ideals due to logistic reasons (including time constraint).

When the proposal was developed, the plan was to go for an urban-rural ratio of 1:3 in order to enlarge the scope of generalizability. However, the ratio was brought down to 1:1.35 in response to limited resources.

The "gold standard" used to validate the level of physical activity computed from the questionnaires was - motion monitor - which is able to record only horizontal movement of the body. It doesn't record activities carried out in the absence of movement along horizontal plane.

The inability to blind participants for type of assessment (due to nature of "gold standard" used) could lead to improvement in the level of physical activity due to awareness of being evaluated - so called Hawthorne effect. Fear of damaging the instrument, by at least some of the participants, could not be totally ruled out as a factor diminishing physical activity during study period.

Recommendations

Reliability and validity tests of instruments for measuring levels of physical activity should precede application on large-scale studies. Reliability and validity tests should be conducted across different seasons and regions to take into account seasonal and regional differences.

This study attempted to address interrater and intrarater variabilities by standardized training. However, future studies should try to quantify these possible sources of bias.

Instruments for assessing physical activity in setting like ours should focus on work and travel and take into account the low level of education and subsequent difficulty in accurately reporting time spent on respective activities. Despite the high prevalence of physical activity in the study population, it is advisable to emphasize that work and travel took the lion share of hours spent physically active, and give priority to promotional work geared towards enhancing time spent on these activities, as it would pay off.

Creating conducive environment for physically demanding leisure activities such as construction of sport facilities is strongly recommended, as it would entitle leisure time physical activity to proper share of time. Communication and Social Mobilization (CSM) activities by way of sensitization, increasing frequency of mass rallies and involving public figures, among others, are also recommended.

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Annex I

አዲስ አበባ ዩኒቨርስቲ
ቡታጂራ ገጠር ጤና ኘሮግራም
የፈቃደኝነት ቅጽ

ስሜ ከላይ የተጠቀሰው ግለሰብ የቡታጂራ ገጠር ጤና ኘሮግራም የሰውነት እንቅስቃሴን በተመለከተ በሚያደርገው ጥናት ላይ የእንቅስቃሴ መለኪያ መሳሪያ በወገቤ ላይ እንዳስርና ጥናቱ ሲያበቃ እንድመለስ ተጠይቄ ፈቃደኛ መሆኔን በፊርማዬ አረጋግጣለሁ::

| --- | --- | --- | --- |
| **ስም** | **ፊርማ** | **ቀን** | **የቤት ቁጥር** |

Addis Ababa University
Butajira Rural Health Programme
Consent Form

I volunteered to participate in a study that deals with measurement of physical activity conducted under Butajira Rural Health Programme. I take the responsibility to wear the instrument properly and return at the end of the study.

_____	_____	_____	_____
Name	Signature	Date	House No

Annex II

Subject and Equipment Tracking Form

Kebele	H. No	Name	Order of GPAQ/IPAQ	Pedometer returned (Yes/No)

Annex III

Global Physical Activity Questionnaire (GPAQ)

CORE Physical Activity (Section P)				
Next I am going to ask you about the time you spend doing different types of physical activity. Please answer these questions even if you do not consider yourself to be an active person. Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, household chores, harvesting food, fishing or hunting for food, seeking employment. *[Insert other examples if needed]*				
P 1	Does your work involve mostly sitting or standing, with walking for no more than 10 minutes at a time?	Yes 1 No 2	☐	*If Yes, go to P6*
P 2	Does your work involve vigorous activity, like [*heavy lifting, digging or construction work*] for at least 10 minutes at a time? *INSERT EXAMPLES & USE SHOWCARD*	Yes 1 No 2	☐	*If No, go to P4*
P 3a	In a typical week, on how many days do you do vigorous activities as part of your work?	Days a week	☐☐	
P 3b	On a typical day on which you do vigorous activity, how much time do you spend doing such work?	In hours and minutes OR in Minutes only	hrs ☐☐ : mins ☐☐ or minutes ☐☐☐	
P 4	Does your work involve moderate-intensity activity, like brisk walking *[or carrying light loads*] for at least 10 minutes at a time? *INSERT EXAMPLES & USE SHOWCARD*	Yes 1 No 2	☐	*If No, go to P6*
P 5a	In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Days a week	☐☐	
P 5b	On a typical day on which you did moderate-intensity activities, how much time do you spend doing such work?	In hours and minutes OR in Minutes only	hrs ☐☐ : mins ☐☐ or minutes ☐☐☐	
P 6	How long is your typical work day?	Number of hours	hrs ☐☐	
Other than activities that you've already mentioned, I would like to ask you about the way you travel to and from places. For example to work, for shopping, to market, to church. [*insert other examples if needed*]				
P 7	Do you walk or use a bicycle (*pedal cycle*) for at least 10 minutes continuously to get to and from places?	Yes 1 No 2	☐	*If No, go to P9*
P 8a	In a typical week, on how many days do you walk or bicycle for at least 10 minutes to get to and from places?	Days a week	☐☐	
P 8b	How much time would you spend walking or bicycling for travel on a typical day?	In hours and minutes	hrs ☐☐ : mins ☐☐	

		OR in Minutes only	or minutes ☐☐☐	
The next questions ask about activities you do in your leisure time. Think about activities you do for recreation, fitness or sports *[insert relevant terms*]. Do not include the physical activities you do at work or for travel mentioned already.				
P 9	Does your [*recreation, sport or leisure time*] involve mostly sitting, reclining, or standing, with no physical activity lasting more than 10 minutes at a time?	Yes 1 No 2	☐	*If Yes, go to P 14*
P 10	In your [*leisure time*], do you do any vigorous activities like [*running or strenuous sports, weight lifting*] for at least 10 minutes at a time? *INSERT EXAMPLES & USE SHOWCARD*	Yes 1 No 2	☐	*If No, go to P 12*
P 11a	If Yes, In a typical week, on how many days do you do vigorous activities as part of your [*leisure time*]?	Days a week	☐☐	
P 11b	How much time do you spend doing this on a typical day?	In hours and minutes OR in Minutes only	hrs ☐☐ : mins ☐☐ or minutes ☐☐☐	

P 12	In your [*leisure time*], do you do any moderate-intensity activities like brisk walking,[*cycling or swimming*] for at least 10 minutes at a time? *INSERT EXAMPLES & USE SHOWCARD*	Yes 1 No 2	☐	*If No, go to P 14*
P 13a	If Yes In a typical week, on how many days do you do moderate-intensity activities as part of [*leisure time*]?	Days a week	☐☐	
P 13b	How much time do you spend doing this on a typical day?	In hours and minutes OR in Minutes only	hrs ☐☐ : mins ☐☐ or minutes ☐☐☐	
The following question is about sitting or reclining. Think back over the past 7 days, to time spent at work, at home, in *[leisure]*, including time spent sitting at a desk, visiting friends, reading, or watching television, but do not include time spent sleeping.				
P 14	Over the past 7 days, how much time did you spend sitting or reclining on a typical day?	In hours and minutes OR in Minutes only	hrs ☐☐ : mins ☐☐ or minutes ☐☐☐	

Annex IV

Short Last 7 Days IPAQ

READ: I am going to ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

READ: Now, think about all the *vigorous* activities which take *hard physical effort* that you did in the last 7 days. Vigorous activities make you breathe much harder than normal and may include heavy lifting, digging, aerobics, or fast bicycling. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities?

   _____ Days per week [VDAY; Range 0-7, 8,9]

   8. Don't Know/Not Sure

   9. Refused

   [**Interviewer clarification**: Think only about those physical activities that you do for at least 10 minutes at a time.]

   [**Interviewer note**: If respondent answers zero, refuses or does not know, skip to Question 3]

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

   __ __ Hours per day [VDHRS; Range: 0-16]

   __ __ __ Minutes per day [VDMIN; Range: 0-960, 998, 999]

   998. Don't Know/Not Sure

   999. Refused

   [**Interviewer clarification**: Think only about those physical activities you do for at least 10 minutes at a time.]

   [**Interviewer probe**: An average time for one of the days on which you do vigorous activity is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend **over the last 7 days** doing vigorous physical activities?"

   __ __ Hours per week [VWHRS; Range: 0-112]

   __ __ __ __Minutes per week [VWMIN; Range: 0-6720, 9998, 9999]

   9998. Don't Know/Not Sure

9999. Refused

READ: Now think about activities which take *moderate physical effort* that you did in the last 7 days. Moderate physical activities make you breathe somewhat harder than normal and may include carrying light loads, bicycling at a regular pace, or doubles tennis. Do not include walking. Again, think about only those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities?

_____ Days per week [MDAY; Range: 0-7, 8, 9]
8. Don't Know/Not Sure
9. Refused

[**Interviewer clarification**: Think only about those physical activities that you do for at least 10 minutes at a time]

[**Interviewer Note**: *If respondent answers zero*, refuses or does not know, skip to Question 5]

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

__ __ Hours per day [MDHRS; Range: 0-16]
__ __ __ Minutes per day [MDMIN; Range: 0-960, 998, 999]
998. Don't Know/Not Sure
999. Refused

[**Interviewer clarification**: Think only about those physical activities that you do for at least 10 minutes at a time.]

[**Interviewer probe**: An average time for one of the days on which you do moderate activity is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, or includes time spent in multiple jobs, ask: "What is the total amount of time you spent over the **last 7 days** doing moderate physical activities?"

__ __ __ Hours per week [MWHRS; Range: 0-112]
__ __ __ __Minutes per week [MWMIN; Range: 0-6720, 9998, 9999]
9998. Don't Know/Not Sure
9999. Refused

READ: Now think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

____ Days per week [WDAY; Range: 0-7, 8, 9]
8. Don't Know/Not Sure
9. Refused

[**Interviewer clarification**: Think only about the walking that you do for at least 10 minutes at a time.]

[**Interviewer Note**: *If respondent answers zero*, refuses or does not know, skip to Question 7]

6. How much time did you usually spend **walking** on one of those days?

__ __ Hours per day [WDHRS; Range: 0-16]
__ __ __ Minutes per day [WDMIN; Range: 0-960, 998, 999]
998. Don't Know/Not Sure
999. Refused

[**Interviewer probe**: An average time for one of the days on which you walk is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "What is the total amount of time you spent walking over **the last 7 days**?"

__ __ __ Hours per week [WWHRS; Range: 0-112]
__ __ __ __Minutes per week [WWMIN; Range: 0-6720, 9998, 9999]
9998. Don't Know/Not Sure
9999. Refused

READ: Now think about the time you spent sitting on week days during the last 7 days. Include time spent at work, at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television.

7. During the last 7 days, how much time did you usually spend ***sitting*** on a **week day**?

__ __ Hours per weekday [SDHRS; 0-16]

__ __ __ Minutes per weekday [SDMIN; Range: 0-960, 998, 999]
998. Don't Know/Not Sure
999. Refused

[**Interviewer clarification**: Include time spent lying down (awake) as well as sitting]

[**Interviewer probe**: An average time per day spent sitting is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: “What is the total amount of time you spent *sitting* last **Wednesday**?”

__ __ Hours on Wednesday [SWHRS; Range 0-16]

__ __ __ Minutes on Wednesday [SWMIN; Range: 0-960, 998, 999]

998. Don't Know/Not Sure

999. Refused

Annex V

የጥናት ቁጥር

የአካል እንቅስቃሴን የተመለከተ ጥናት [ቡታጅራ]

ጉብኝት 1ኛ ☐

የመልስ ሰጪ የጥናት መለያና ስነ-ሕዝባዊ መረጃ 2ኛ ☐

D1	**የተጠያቂው ስም**	_____	
D2	**የቤት ቁጥር**	☐☐☐☐.☐	☐☐☐☐☐
D3	**ቀበሌ** (ገበሬ ማህበር)	_____	☐☐☐
D4	**ያታ**	1. **ወንድ** 2. **ሴት**	☐
D5	**ዕድሜ** (ዓ.መት)	_____	☐☐
D6	**ሃይማኖት**	1. **ኦርቶዶክስ ክርሰቲያን** 2. **እስላም** 3. **ፕሮቴስታንት** 4. **ካቶሊክ** 5. **ሌላ** (ይገለፅ)_____	☐
D7	**ብሄረሰብ**	1. **ሲልጢ** 2. **መስቃን** 3. **ማረቆ** 4. **ዶቢ** 5. **ሶዶ** 6. **ወለኔ** 7. **ኦሮሞ** 8. **አማራ** 9. **ሌላ** (ይገለፅ)_____	☐
D8	**የጋብቻ ሁኔታ**	1. **ያላገባ/ች** 2. **ያገባ/ች** (ባለትዳር) 3. **የተፋታ/ች** 4. **ባል/ሚስት የተሞተባት/በት**	☐
D9	**መልስ ሰጪው ያጠናቀቀው የትምህርት ደረጃ** [ከ12ኛ ክፍል በላይ ከሆነ 12+1, 12+2, ወዘተ በማለት ይመዝገብ::]	**ማንበብና መፃፍ የማይችል** ..... 00 **ማንበብና መፃፍ የሚችል** ..... 99 **መደበኛ ትምህርት ከተከታተሉ ያጠናቀቁት ክፍል** _____	☐☐

D10	በምን ሥራ ነው የሚተዳደሩት? [በዋነኛነት የሚሰሩዋቸውን ሁለት ስራዎች በቅደም ተከተላቸው መሰረት ይግለፁ::]	1ኛ. (ዋነኛ) _____ 2ኛ. (ተጨማሪ) _____	☐ ☐

ግሎባል የአካል እንቅስቃሴ ቃለ መጠይቅ (GPAQ)

የአካል እንቅስቃሴ (ክፍል P)		Physical Activity - Core	
ከዚህ በመቀጠል የተለያዩ እንቅስቃሴዎች በማድረግ ስለሚያሳልፉት ጊዜ ጥያቄዎች አቀርብልዎታለሁ:: [ራስዎን ብዙ የአካል እንቅስቃሴ እንደማያደርግ ሰው ቢቆጥሩም (ቢያስቡም) እንኳ ለጥያቄዎቹ መልስ ይስጡ::] በመጀመሪያ ስራ በመስራት ስለሚያሳልፉት ጊዜ ያስቡ:: ስራ ሲባል በክፍያ ወይም ያለክፍያ የሚሰራን፣ የቤት ውስጥ የዕለት ሥራ (ቆሎ መፋቅ፡ ምግብ ማብሰል) ሰብል መሰብሰብ፣ ማገዶ መሰብሰብ፣ ውሃ መቅዳት፣ ገበያ መሄድ ወዘተ ያጠቃልላል:: [እንደ አስፈላጊነቱ ሌሎች ምሳሌዎች ተጠቀም]			
		ምላሽ	ኮድ
P1	ሥራዎ መቀመጥ ወይም መቆም የሚበዛበት፣ ሆኖ በአንድ ጊዜ ከ10 ደቂቃ በላይ በእግር መጊዝ የማይጠይቅ ነው?	አዎ ወደ "P6 እለፍ".....1 የለም.....2	☐
P2	ሥራዎ ብርቱ ጉልበት የሚጠይቅ ተግባር [እንደ ከባድ ሸክም፣ ቁፋሮ ወይም የግንባታ ሥራ] በአንድ ጊዜ ከ10 ደቂቃ በላይ ማከናወንን ይጠ ይቃል? [ምሳሌዎችን ተጠቀም]	አዎ .....1 የለም ወደ "P4 እለፍ".....2	☐
P3.1	በሥራ ላይ ዘወትር በሳምንት ለስንት ቀናት ብርቱ ጉልበት የሚጠይቅ ተግባር ያከናውናሉ?	የቀናት ቁጥር _____	☐☐
P3.2	ብርቱ ጉልበት የሚጠይቅ ተግባር በሚያከናውኑበት ዕለት እንደዚህ ዓይነት ስራ ለምን ያህል ጊዜ ይሰራሉ?	በሰዓትና በደቂቃ _____ ሰዓት_____ ደቂቃ ወይም በደቂቃ ብቻ _____ ደቂቃ	
P4	ሥራዎ መጠነኛ ጉልበት የሚጠይቅ ተግባር [እንደ ፈጣን እርምጃ ወይም ቀላል ሸክም] በአንድ ጊዜ ከ10 ደቂቃ በላይ ማከናወንን ይጠይቃል? [ምሳሌዎችን ተጠቀም]	አዎን .....1 የለም ወደ "P6 እለፍ".....2	☐

P5.1	በሳምንት ውስጥ ከሥራዎ ጋር በተያያዘ መጠነኛ ጉልበት የሚጠይቅ ተግባር ለስንት ቀናት ያከናውናሉ?	የቀናት ቁጥር _____	☐☐
P5.2	መጠነኛ ጉልበት የሚጠይቅ ተግባር በሚያከናውኑበት ቀን ይህን አይነት ሥራ ለምን ያህል ጊዜ (ሰዓት/ደቂቃ) ይሰራሉ?	በሰዓትና በደቂቃ _____ ሰዓት_____ ደቂቃ ወይም በደቂቃ ብቻ _____ ደቂቃ	
P6	አብዛኛውን ጊዜ በቀን ስንት ሰዓት ይሰራሉ?	የሰዓታት ቁጥር_____	☐☐

አሁን ደግሞ ቀደም ብለው ከገለፁልኝ ተግባራት ሌላ፤ ከቦታ ወደ ቦታ [ለምሳሌ ወደ ሥራ፣ ገበያ፣ ወንዝ፣ ቤተክርስቲያን፣ መስጊድ ወዘተ] እንዴት እንደሚንቀሳቀሱ እጠይቅዎታለሁ::			
		ምላሽ	ኮድ
P7	ከቦታ ወደ ቦታ ለመንቀሳቀስ ያለማቂረጥ ቢያንስ ለ10 ደቂቃ በእግርዎ ወይም በብስክሌት ይጓዛሉ?	አዎ .....1 የለም ወደ "P9 እለፍ".....2	☐
P8.1	ዘወትር በሳምንት ለስንት ቀናት ቢያንስ ለ10 ደቂቃ በእግርዎ ወይም በብስክሌት ይጓዛሉ?	የቀናት ቁጥር _____	☐☐
P8.2	በእግርዎ ወይም በብስክሌት በሚጓጓዙ ቀን ምን ያህል ጊዜ (ደቂቃ/ሰዓት) በጉዞ ላይ ያሳልፋሉ?	በሰዓትና በደቂቃ _____ ሰዓት_____ ደቂቃ ወይም በደቂቃ ብቻ _____ ደቂቃ	
ከዚህ የሚከተሉት ጥያቄዎች በትርፍ ጊዜዎ የሚያከናውኑአቸውን ተግባራት ይመለከታሉ :: ለመዝናናት ለአካል ብቃት ወይም ለስፖርትዊ እንቅስቃሴ ሲባል የሚያደርጉትን ተግባራት ያስቡ:: በሥራ ወይም በጉዞ ላይ የሚደረጉትና ቀደም ብለው የተዘረዘሩትን ተግባራት አይጨምርም::			
P9	ለመዝናናት ለአካል ብቃት ወይም ለትራንስፖርት ሲባል የሚያሳልፉት ጊዜ መቀመጥ፣ መንጋለል ወይም መጋደም ወይም መቆም የሚበዛበት፤ ሆኖ በአንድ ጊዜ ከ10 ደቂቃ በላይ የማያንቀሳቅስ ዓይነት ነው?	አዎ ወደ "P14 እለፍ".....1 የለም.....2	☐
P10	በእረፍት ጊዜዎ እንደ ሩጫ፣ ክብደት ማንሳት ያሉ ብርቱ ጉልበት የሚጠይቁ እንቅስቃሴዎችን በአንድ ጊዜ ቢያንስ ለ10 ደቂቃ ያደርጋሉ? [ምሳሌዎችን ተጠቀም]	አዎ .....1 የለም ወደ "P12 እለፍ".....2	☐

P11.1	መልስዎ "አዎን" ከሆነ በእረፍት ጊዜዎ ብርቱ ጉልበት የሚጠይቁ እንቅስቃሴዎችን ዘወትር በሳምንት ለሥንት ቀናት ያደርጋሉ?	የቀናት ቁጥር _____	☐☐
P11.2	ከነዚያ ቀናት በአንዱ ምን ያህል ጊዜ ብርቱ ጉልበት የሚጠይቁ እንቅስቃሴዎችን በማድረግ ያሳልፋሉ?	በሰዓትና በደቂቃ _____ ሰዓት_____ ደቂቃ ወይም በደቂቃ ብቻ _____ ደቂቃ	
P12	በእረፍት ጊዜዎ እንደ ፈጣን እርምጃ፣ ብስክሌት መንዳት ያሉ መጠነኛ ጉልበት የሚጠይቁ እንቅስቃሴዎችን በአንድ ጊዜ ቢያንስ ለ10 ደቂቃ ያደርጋሉ ? [ምሳሌዎችን ተጠቀም]	አዎ .....1 የለም ወደ "P14 እለፍ"....2	☐
P13.1	መልስዎ "አዎን" ከሆነ በእረፍት ጊዜዎ መጠነኛ ጉልበት የሚጠይቁ እንቅስቃሴዎችን ዘወትር በሳምንት ለስንት ቀናት ያደርጋሉ?	የቀናት ቁጥር _____	☐☐
P13.2	ከነዚያ ቀናት በአንዱ በእረፍት ጊዜዎ መጠነኛ ጉልበት የሚጠይቁ እንቅስቃሴዎችን ለምን ያህል ጊዜ ያደርጋሉ?	በሰዓትና በደቂቃ _____ ሰዓት_____ ደቂቃ ወይም በደቂቃ ብቻ _____ ደቂቃ	
ከዚህ የሚከተለው ጥያቄ መቀመጥ ወይም መንጋለልን (መጋደም) በተመለከተ ይሆናል:: ባለፉት 7 ቀናት በሥራ ቦታ፣ በቤት ወይም በእረፍት ጊዜዎ የዕህፈት ሥራ በመስራት፣ ጊደኞችዎን በመጎብኘት፣ በማንበብ ወይም ቴሌቪዥን በመመልከት ስላሳለፉት ጊዜ ያስቡ:: በእንቅልፍ ያሳለፉትን ጊዜ አይጨምርም::			
P14	ካለፉት 7 ቀናት በአንዱ በመቀመጥ ወይም በመንጋለል (በመጋደም) ምን ያህል ጊዜ አሳለፉ?	በሰዓትና በደቂቃ _____ ሰዓት_____ ደቂቃ ወይም በደቂቃ ብቻ _____ ደቂቃ	

PHYSICAL MEASUREMENTS

Pm1	**Weight (Kg)**	☐☐ ☐
Pm2	**Height (M)**	☐ ☐☐
Pm3	**PEDOMETER reading**	
	Date of interview	
	Interviewer (Name & Signature)	
	Supervisor (Name & Signature)	

Annex VI

የ7 ቀናት የአካል እንቅስቃሴ ቃለመጠይቅ (IPAQ-Short)

ይነበብ

ባለፉት ሰባት ቀናት የአካል እንቅስቃሴ በማድረግ ስላሳለፉት ጊዜ ልጠይቅዎት ነው።።
ራስዎን ብዙ የአካል እንቅስቃሴ እንደማያደርግ ሰው ቢያስቡም እንኳ ለጥያቄዎቹ መልስ ይስጡ።። በሥራ ቦታ፣ በጉዞ ላይና በእረፍት ጊዜዎ ለመዝናናት ለስፖርት ሲባል ስለሚያደርጉአቸው እንቅስቃሴዎች ያስቡ።። መጀመሪያ ባለፉት 7 ቀናት ስላከናወኑአቸው ብርቱ ጉልበት የጠየቁ ተግባራት ያስቡ።። ብርቱ ጉልበት የሚጠይቅ ተግባር ከተለመደው በላይ በጣም እንዲተነፍሱ የሚያደርግ ሲሆን ከባድ ሸክም፣ ቁፋሮ፣ ኤሮቢክስ፣ በፍጥነት ብስክሌት መጋለብ የመሳሰሉትን ያጠ ቃልላል።። ታዲያ በአንድ ጊዜ ቢያንስ ለ10 ደቂቃ ስላደረጉዋቸው አካላዊ እንቅስቃሴዎች ብቻ ያስቡ።።

I 1. ባለፉት 7 ቀናት ብርቱ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን ለስንት ቀናት አደረጉ?
በሳምንት ለ _____ ቀናት [ከ 0-7]
አላውቅም 8
ፈቃደኛ ያልሆነ.....9

[<u>ማብራሪያ ለቃ/መ አቅራቢው</u>፡-
ቢያንስ ለ10 ደቂቃ ስለሚያደርጊቸው አካላዊ እንቅስቃሴዎች እንዲያስቡ አግዝ]

[<u>ማስታወሻ ለቃ/መ አቅራቢው</u>፡-
ምላሹ ዜሮ፣ ፈቃደኛ ያልሆነ ወይም አላውቅም ከሆነ ወደ <u>"ጥያቄ I 3" እለፍ/ፊ</u>]

I 2. በነዚያ ቀናት ብርቱ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን በማድረግ ምን ያህል ጊዜ ያሳልፋሉ?
በቀን _____ ሰዓት [0-16]
በቀን _____ደቂቃ [ከ 0-960]
አላውቅም.....998
ፈቃደኛ ያልሆነ..... 999

[<u>ማብራሪያ ለቃ/መ አቅራቢው</u>፡-
ቢያንስ ለ10 ደቂቃ ስለሚያደርጊቸው አካላዊ እንቅስቃሴዎች እንዲያስቡ አግዝ]

<u>ማውጣጫ ለቃ/መ/ አቅራቢው</u>፡ ከነዚያ ቀናት በአንዱ ብርቱ ጉልበት የሚጠይቅ እንቅስቃሴ በማድረግ በአማካኝ ስላሳለፉት ጊዜ ለማወቅ ይፈለጋል።።

ያሳለፉት ጊዜ ከቀን ቀን በጣም የሚለያይ በመሆኑ ሳቢያ ለመመለስ ካልቻሉ ባለፉት 7 ቀናት ብርቱ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን በማድረግ በድምሩ ምን ያህል ጊዜ አሳለፉ? በማለት ጠ ይቅ/ቂ።።

በሳምንት _____ ሰዓት [ከ 0-112]
በሳምንት _____ ደቂቃ [ከ 0-6720]
አላውቅም..... 9998
ፈቃደኛ ያልሆነ..... 9999

<u>ይነበብ</u>:- ባለፉት 7 ቀናት ቀናት መጠነኛ ጉልበት የሚጠይቅ ተግባር በማከናወን ስላሳለፉት ጊዜ ያሰቡ:: መጠነኛ ጉልበት የሚጠይቅ ተግባር ከተለመደው በላይ እንዲተነፍሱ የሚያደርግ ሲሆን ቀላል ሽክም፣ በመጠነኛ ፍጥነት ብስክሌት መጋለብ ሊሆን ይችላል:: የእግር ጉዞን አይጨምርም:: ታዲያ በአንድ ጊዜ ቢያንስ ለ 10 ደቂቃ ስለአደረጓቸው አካላዊ እንቅስቃሴዎች ብቻ ያስቡ::

I 3. ባለፉት 7 ቀናት መጠነኛ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን ለስንት ቀናት አደረጉ?

በሳምንት ለ_____ ቀናት [ከ0-7]
አላውቅም..... 8
ፈቃደኛ ያልሆነ 9

[**<u>ማብራሪያ ለቃ/መ/ አቅራቢው:</u>**-
ቢያንስ ለ10 **ደቂቃ ስለሚያደርጊቸው አካላዊ እንቅስቃሴዎች እንዲያስቡ አግዝ/ዢ**]

[**<u>ማስታወሻ ለቃ/መ/ አቅራቢው:</u>**-
ምላሹ ዜሮ፣ ፈቃደኛ ያልሆነ ወይም አላውቅም ከሆነ ወደ <u>"ጥያቄ I 5" እለፍ/ፊ</u>]

I 4. በነዚያ ቀናት መጠነኛ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን በማድረግ ምን ያህል ጊዜ ያሳልፋሉ?

በቀን _____ ሰዓት [ከ0-16]
በቀን _____ ደቂቃ[ከ0-960]
አላውቅም..... 998
ፈቃደኛ ያልሆነ 999

[**<u>ማብራሪያ ለቃ/መ/ አቅራቢው:</u>**-
ቢያንስ ለ10 **ደቂቃ ስለሚያደርጊቸው አካላዊ እንቅስቃሴዎች እንዲያስቡ አግዝ/ዢ**]

[**<u>ማውጣጫ ለቃ/መ/አቅራቢው:</u>**-
ከነዚያ ቀናት በአንዱ መጠነኛ ጉልበት የሚጠይቅ እንቅስቃሴ በማድረግ በአማካኝ ስላሳለፉት ጊዜ ለማወቅ ተፈልጊል:: ያሳለፉት ጊዜ ከቀን ወደ ቀን በጣም የሚለያይ በመሆኑ ሳቢያ ለመመለስ ካልቻሉ "ባለፉት 7 ቀናት መጠነኛ ጉልበት የሚጠይቁ አካላዊ እንቅስቃሴዎችን በማድረግ በድምሩ ምን ያህል ጊዜ አሳለፉ?" በማለት ጠይቅ/ቂ::]

በሳምንት _____ _____ _____ ሰዓት [ከ 0-112]
በሳምንት ____ ____ _____ ____ ደቂቃ [ከ 0-6720]
አላውቅም..... 9998
ፈቃደኛ ያልሆነ..... 9999

<u>ይነበብ</u>:- **አሁን ባለፉት 7 ቀናት በእግር ጉዞ ስላሳለፉት ጊዜ አስቡ:: ይህ በሥራ፣ በቤት፣ በጉዞ፣ በመዝናኛ፣ በስፖርት ወይም በዕረፍት ጊዜ የሚደረግ የእግር ጉዞን ያጠቃልላል::**

I 5. ባለፉት 7 ቀናት በአንድ ጊዜ ቢያንስ የ10 ደቂቃ የእግር ጉዞ ለስንት ቀናት አደረጉ?

በሳምንት _____ ቀናት [ከ 0-7]
አላውቅም 8
ፈቃደኛ ያልሆነ..... 9

[**<u>ማብራሪያ ለ ቃ/መ አቅራቢው</u>**:-**ቢያንስ ለ**10 **ደቂቃ ስለሚያደርጉት የእግር ጉዞ እንዲያስቡ አግዝ/ዥ**]

[**ማስታወሻ ለቃ/መ/ አቅራቢው**:-
ምላሹ ዜሮ፣ ፈቃደኛ ያልሆነ ወይም አላውቅም ከሆነ ወደ ጥያቄ 7 እለፍ/ፊ]

I 6. በነዚያ ቀናት የእግር ጉዞ በማድረግ ምን ያህል ጊዜ ያሳልፋሉ?

በቀን _____**ሰዓት** [0-16]
በቀን_____**ደቂቃ** [0-960]
አላውቅም..... 998
ፈቃደኛ ያልሆነ..... 999

[**ማውጣጫ ለቃ/መ/ አቅራቢው**:-
ከነዚያ ቀናት በአንዱ የእግር ጉዞ በማድረግ በአማካኝ ስላሳለፉት ጊዜ ለማወቅ ይፈለጋል። ያሳለፉት ጊዜ ከቀን ቀን በጣም የሚለያይ በመሆኑ ሳቢያ ለመመለስ ካልቻሉ 'ባለፉት 7 ቀናት የእግር ጉዞ በማድረግ በድምሩ ምን ያህል ጊዜ አሳለፉ?" በማለት ጠይቅ/ቂ።]

በሳምንት_____ **ሰዓት** [ከ 0-112]
በሳምንት _____ **ደቂቃ** [ከ 0-6720]
አላውቅም 9998
ፈቃደኛ ያልሆነ 9999

አንብብ:
አሁን ባለፉት 7 ቀናት ውስጥ በነበሩት የሥራ ቀናት ቁጭ በማለት ስላሳለፉት ጊዜ አስቡ። በሥራ፣ በቤት፣ በትምህርት፣ በዕረፍት ያሳለፉትን ጊዜ ያጠቃሉ። ይህ በዕህፈት ሥራ፣ ጊደኞችን በመጎብኘት፣ በማንበብ፣ በመቀመጥ፣ በመንጋለል ወይም ቴሌቪዥን በመመልከት ያሳለፉትን ጊዜ ሊያጠቃልል ይቻላል።

I 7. ባለፉት 7 ቀናት ከነበሩት የሥራ ቀናት በአንዱ ምን ያህል ጊዜ ቁጭ በማለት አሳለፉ?

በቀን _____ _____ **ሰዓት** [ከ0-16]
በቀን _____ _____ _____ **ደቂቃ** [ከ0-960]
አላውቅም 998
ፈቃደኛ ያልሆነ 999

[**ማብራሪያ ለቃ/መ አቅራቢው:**-
በመንጋለል (እንቅልፍ አልባ) እንዲሁም በመቀመጥ ያሳላፉትን ጊዜ አካት (ጨምር)]

[**ማውጣጫ ለቃ/መ/ አቅራቢው:**-
ከነዚያ ቀናት በአንዱ ቁጭ በማለት በአማካኝ ስላሳለፉት ጊዜ ለማወቅ ተፈልጊል። ያሳለፉት ጊዜ ከቀን ቀን በጣም የሚለያይ በመሆኑ ሳቢያ ለመመለስ ካልቻሉ "ባለፈው ረቡዕ ቁጭ ብለው በድምሩ ምን ያህል ጊዜ አሳለፉ?" በማለት ጠይቅ/ቂ]

ረብዑ ዕለት ለ _____ **ሰዓት** [ከ 0-16]
ረብዑ ዕለት ለ _____ **ደቂቃ** [ከ 0-960]
አላውቅም 998
ፈቃደኛ ያልሆነ 999

Annex VII

Discussion points to facilitate Key-Informant Interviews

- Discuss physical activity of a typical male and female residents in your area.
    - Vigorous: heavy load, construction, digging
    - Moderate: light load, brisk walking
    - Length of working day, number of working days

- What is the mode of transport like? (to market, to work)

- What are the common pastimes among the residents in your locality?

- How common is the practice of sport activities among males and females, youth and elderly and so on.

Annex VIII

የአካል እንቅስቃሴ ጥናት የመረጃ አጠናቃሪዎች ሥልጠና መርጃ

አጠቃላይ መመሪያ፡-

- በቂ የቃለ መጠይቅ ቅጾች፣ ወረቀት ማስደገፊያ፣ ሁለት ብዕሮች፣ ቁመትና ክብደት መለኪያ መያዝህን/ሽን አረጋግጪ።

- መረጃ ሰጭው ጋ በቀጠሮ ስዓት ለመድረስ ቀደም ብለህ/ሽ ጉዞ መጀመርህን/ሽን አረጋግጥ/ጪ።

- ከማንኛውም የመረጃ አሰባሰብ ሥራ በፊት አግባብ ያለው /ዕድሜን ከግምት ያስገባ/ ሰላምታ መስጠት ሊቀድም ይገባል።

- መረጃ ሰጪው ለቃለ ምልልሱ የተመረጠ መሆኑን በመግለጽ ፈቃደኝነቱን ጠይቅ/ቂ።

- ፈቃድ ካገኘህ/ሽ በኋላ መቀመጫ እንዲሰጥህ/ሽ ጠይቅ/ቂ።

- መረጃ ሰጪውና ቃለ መጠይቅ አቅራቢው/ዋ አቀማመጣቸው በ45 ዲግሪ ቢሆን ይመረጣል። ይህም እንግዳ ሰውን ፊት ለፊት ማየት የሚቸገሩ መረጃ ሰጪዎች ዘና እንዲሉና የበለጠ ውጤታማ እንዲሆኑ ይረዳል።

- ጥያቄህን/ሽን መረጃ ሰጪው ሊረዱ ካልቻሉ በተረጋጋ ሁኔታ ጥያቄውን /ያለተጨማሪ ማብራሪያ/ በድጋሚ አቅርብ/ቢ። በድጋሚም ሊረዱ ካልቻሉ ማብራሪያ በመስጠት መመለስ እንዲችሉ አድርግ/ጊ።

- አንዳንድ መረጃ ሰጪዎች ምንም ዓይነት እንቅስቃሴ እንደማያደርጉ ሊገልጹ ይችላሉ። ይሁን እንጂ ወደዝርዝሩ ሲገቡ ሁኔታው የተለየ ሊሆን ስለሚችል ቃለ መጠየቁን እንዲገፉበት አበረታታ/ቺ።

- ምርጫዎቹ ከግራ ወደቀኝ የሚተላለፉ የተራ ቁጥር ስላላቸው በጥንቃቄ ሙላ/ይ።

- መረጃ ሰጪው ለሚሰጡት ምላሽ መገረምን ማሳየት/መግለጽ/ የለብንም / አንገት መነቅነቅ፣ ከንፈር መምጠጥ ወዘተ .../

- ቃለ መጠይቁን በምን ሁኔታ ላይ እንደሆነ መግለጽ ተገቢ ነው / ግማሽ ደርሰናል፣ ልንጨርስ ነው ወዘተ .../

ከቃለ መጠይቅ የሚያገሉ ሁኔታዎች

- ቃለ መጠይቅ ለመስጠት ፈቃደኛ ካልሆኑ
- ዕድሜያቸው ከ18 - 65 ዓመት ክልል ውጭ ከሆነ
- በወቅቱ ከባድ የጤና እክል ካለባቸው
- መስማት፣ ማየት የማይችሉ /የተሳናቸው/
- አካለ ጎዶሎ የሆኑ /እጅ ወይም እግር የሌላቸው/

ለቃለ መጠይቅ ምቹ ሁኔታዎች

- መረጃ ሰጪው የሚመቸውን ጊዜ እንዲመርጥ ማድረግ፡፡

  - መረጃ ሰጪውና መረጃ አጠናቃሪው ምቹ ሥፍራ ማግኘታቸውን ማረጋገጥ/ፀጥታ ያለው ጥሩ መቀመጫ ስፍራ/

- መረጃ ሰጪው በሌሎች ሰዎች ያለመከበቡን ማረጋገጥ

- ቃለ መጠይቁ የነዋሪዎቹን የአካል እንቅስቃሴ ደረጃ ለማጥናትና በውጤቱ በመንተራስ የተሻለ የኑሮ ዘይ ለማስተማር የሚረዳ መሆኑን መግለጽ፡፡

- መረጃ ሰጪው ጥናቱን በፈቃደኝነት የሚሳተፍበት መሆኑንና በማንኛውም ጊዜና ሁኔታ እራሳቸውን ለማግለል ነጻ መሆናቸውን መግለጽ፡፡

- መረጃ ሰጪው በቃለ ምልልሱ መካከል የመሰላቸት ሁኔታ ከታየባቸው ዘና የሚያደርግ ወግ በማውራት እረፍት ማድረግና ከቆይታ በኋላ መቀጠል ይመከራል፡፡

- ሴት መረጃ ሰጪዎች ለሴት መረጃ አጠናቃሪ ወንዶችም እንዲሁ ለወንድ መረጃ አጠናቃሪ መረጃ ሊሰጡ ይገባል፡፡

ዝርዝር ነጥቦች

1. **ጉብኝት፡-** መረጃ ሰጪውን ለመጀመሪያ ጊዜ ካገኘኸው/ሽው " ጉብኝት 1ኛ" በሚለው ላይ ምልክት አድርግ/ጊ፡፡ ለ2ኛ ጊዜ ካገኘኸው/ሽው "ጉብኝት 2ኛ " የሚለው ላይ ምልክት አድርግ/ጊ፡፡

2. **ተደጋጋሚ ጉብኝት፡-** በጥናቱ እንዲሳተፍ የታጨ መረጃ ሰጪ በመጀመሪያ ጉብኝት በመኖሪያ ቤቱ ካልተገኘ በሁለት ተጨማሪ ጊዜያት በመመላለስ ለማግኘት ሞክር/ሪ፡፡ በሶስት ተከታታይ ጉብኝት ያልተገኘ መረጃ ሰጪ እንደሌለ ተቆጥሮ በሌላ መረጃ ሰጪ ይተካል፡፡ ይህም በተለየ ማስታወሻ ሪፖርት ይደረጋል፡፡

3. **የሚዘለሉ ጥያቄዎች፡-** መረጃ ሰጪው በሚሰጡት ምላሽ አኳያ ተከታዩን/ዩቹን ጥያቄ/ዎች እንድትዘል/ሊ "ወደ.....እለፍ" የሚል መመሪያ ሲገጥም በመመሪያው መሰረት ወደ ተጠቀሰው ጥያቄ ዝለል/ይ፡፡

4. **የምላሽ ሳጥኖች፡-** ለመልስ መስጫ አንድ ☐ ፣ ሁለት ☐☐ ሶስት ☐☐☐ ወይም ከዚያ በላይ ሳጥኖች ሊኖሩ ይችላል፡፡ በአንድ ሳጥን ውስጥ ሊፃፍ የሚችለው አንድ ቁጥር ብቻ ነው፡፡ ምላሹ አንድ ቁጥር ብቻ ሆኖ ሳለ ሁለት ወይም ከዚያ በላይ ሳጥኖች ሲገጥሙህ/ሽ የመጀመሪያዎቹ ሳጥኖች ውስጥ ዜሮ "0" በመሙላት ቁጥሩን በመጨረሻው ሳጥን ውስጥ ሙላ/ይ፡፡

5. **ምሳሌዎች፡-** በቃለመጠይቁ ያልተካተቱ በአካባቢው ነዋሪ የተለመዱና መረጃ ሰጪው በተሻለ ሁኔታ ሊረዳ የሚችላቸውን ሁኔታ ያካትታል፡፡ ምሳሌዎችን እንድትሰጥ/ እንድትሰጪ ይጠበቃል/ አስፈላጊ ሆኖ ሲገኝ ብቻ/፡፡

6. **ለቃ/መ/አቅራቢው፡-** በዚህ ንዑስ ርዕስ ስር የሚሰጥ መመሪያ ቃለ መጠይቅ አቅራቢ.ያው/፣
በራሱ/ሷ አንብቦ/ባ የሚረዳው/የምትረዳው ነው፡፡

7. **አላስታውስም፡-** መረጃ ሰጪው ተገቢውን ጥረት ቢያደርጉም ማስታወስ አልቻሉም ማለት ነው፡፡

8. **ፈቃደኛ ያልሆኑ፡-** መረጃ ሰጪው በአንድ ወይም በሌላ ምክንያት ለቀረበው ጥያቄ ምላሽ ለመስጠት ፈቃደኛ አይደሉም፡፡

9. **መጋደም /መንጋለል/፡-** በአልጋ/በመደብ/ ላይ የሚደረግ እንቅልፍ አልባ እረፍት ማለት ነው፡፡

10. **ቀጠሮ አሰጣጥ፡-** የመጀመሪያውን ቃለ መጠይቅ ካጠናቀቅህ/ሽ በኋላ ከአራት ቀናት በኋላ እንደምትመለስ/ሽ በመግለጽ ለተደረገልህ/ሽ ትብብር ከልብ በማመስገን በቀጠሮ ዕለት መረጃ ሰጪው ከመኖሪያ ቤቱ እንዲጠብቅ ማስረዳትና ስዓቱን ወስኖ መመዝገብ ይገባል፡፡