Gerontologists have stressed the fundamental role played by physical activity in ameliorating the functional fitness of the elderly masses. A fitness testing method that is used to assign values to this functional fitness of the elderly, estimates the caloric expenditure or intensity of the various physical activities of the elderly. The unit of measurement used for this purpose is called a Metabolic Equivalent (MET). This paper focuses on METs of the physical activities of the elderly in the homes for the aged in Nairobi Province. All of the 150 male and female elderly > 60 years residing in the three homes for the aged, registered and affiliated to HelpAge Kenya in Nairobi Province were used in the study. The design employed a semi-structured interview where a Physical Activity Log Book was employed to record MET intensities of physical activities. The accrued data on METs were subjected to statistical analysis using Statistical Package of Social Sciences (SPSS). The data were presented in tables and pie-charts. The finding of the study was: There were significant differences between METs of past \(6.5 \pm 0.8\) METs) and present \(1.8 \pm 0.9\) METs) physical activities of the elderly in the homes for the aged in Nairobi Province. The study recommended that there is an imperative need for: development of more trained gerontological professionals in exercise and recreational programs of the elderly; diversification of physical activity and recreational programs of the elderly in homes for the aged, and regular fitness testing and evaluation for the elderly residents to know their progression in attainment of fitness goals.

**Key words:** Physical activity, metabolic equivalent, aged population

**INTRODUCTION**

The increase of the ageing society begs for specific interventions to cope with the expected increase in demand for long-term care of ageing society's needs. For instance, the need to create more opportunities for physical activity programs that can help in ameliorating the functional independence of the institutionalized elderly in performing their customary activities (AU Policy Framework and Plan of Action on Ageing, 2007). Although functional decline is an inevitable result of old age, there are ways in which one may reduce the burdens that the elderly must bear. Among them is physical activity (Chodzko-Zajko, 1998). Gerontologists have identified an informal method of measuring Moderate – to – Vigorous Physical Activity (MVPA). This method is used to estimate the caloric expenditure of various physical activities (Siedentop, 2001). The unit of measurement used for this purpose is called a Metabolic Equivalent or MET.
One MET is equal to being at rest and as the activity increases so does the energy expenditure along with the METs intensity. Activities such as slow walking, slow stationary cycling and bowling are typically 3 METs or less and are considered to be light activities. Activities that reach a level of 6 METs are labeled moderate, such as brisk walking, tennis, or mowing the lawn with a power mower. Activities that are 7 METs or higher are considered to be vigorous, such as jogging, fast cycling, mowing the lawn with a hand mower, and many sports.

The measurement of physical activity is highly dependent on self-reports, and there is no widespread agreement on what constitutes vigorous, as opposed to moderate levels of activity (Siedentop, 2001). It is clear that activity such as walking, cycling, aerobics, and calisthenics are popular with and doable by women and men in the post-60 year old age group (Siedentop, 2001). Figure 1 below explains the basis of classification of the physical activities.

Therefore there is evidence that regular physical activity can greatly improve the functional capacity of the old and the ageing (McMurdo, 1999; Cordes and Ibrahim, 1999).

MATERIAL AND METHODS
A descriptive survey design was used to investigate the METs of both past and present physical activities of the elderly. The study was conducted in three homes for the aged in Nairobi Province. These included Kariobangi Chesa Home, Little Sisters of the Poor, and Mji wa Huruma. The study targeted both males and females aged 60 years and above residing in the three registered homes for the elderly. The World Health Organization classifies people who are 60 years and above as old (WHO, 2002) and this classification was considered during the study period. The three homes had 150 residents, with 87 males and 63 females all of whom were studied. A written informed consent was provided to the respondents prior to their participation in the study. The respondents were also assured of confidentiality and that the information from this study was intended for research purposes only. Data on METs of physical activities were obtained through face to face interviews and recorded in Physical Activity Log Book (Onywera,
2007) by the researcher and research assistants. To enhance the quality of data collected, caregivers were used for translation purposes for respondents who could not read or write. The interview was limited to questions that could be answered in about 30 minutes, so as not to tire the respondent. The data obtained were subjected to statistical analysis using the Statistical Package of the Social Sciences (SPSS). The results of the self-reported METs of both past and present physical activities were expressed as a mean value of the established activities. This is because the mean gives the average score, which was used to interpret the METs intensity category of the physical activities of the elderly. The data analyzed were then presented in tables and pie-charts.

**FINDINGS OF THE STUDY**

From the targeted population of 150 people, the researcher interviewed 144. The difference of 6 old adults was not interviewed because of two reasons. Some were cognitively impaired while others could not communicate coherently. These two reasons made it impossible for the researcher and research assistants to gather accurate and reliable information from the 6 old adults. Therefore, the 6 elderly were exempted from the study.

**METs of Past Physical Activities**

Generally, an activity that expended less than five calories per minute (<3.5 METs) was classified as low/light intensity while those activities that expended 5 to 10 calories per minute (4 to 8 METs) were considered of moderate intensity. Activities that ranged from 10 to 14 calories per minute (8 to 12 METs) were considered to be of moderate to high intensity and those greater than 14 calories (12 METs), high intensity. This classification was based on mode of activity denoted by Pollock, Wilmore, and Fox (1978).

The selected past physical activities included sports/dance, occupation, recreational and conditional exercise. The figure below indicates that in general, many activities participated in ranged from the lowest to the highest in METs intensity. That is; < 3.5 (3%), 4 – 8 (8%), 8 – 12 (28%) and <12 (61%) respectively.

![Summary of METs of Past Physical Activities of the Elderly](image)

**Figure 2: General Description of the METs of Past Physical Activities of the Elderly**

In conclusion, the compendium-coded findings were that the participants reported significantly greater time and energy spent in high intensity (>12 METs; 61%) and moderate to high intensity (8-12 METs; 28%) activities; and less time spent in moderate (4 - 8 METs; 8%) and light (<3.5METs; 3%) activities. The gradual increase in magnitude of the intensity could be explained by the physical demand of the occupational, sporting/dancing, conditional exercise and
last but not least recreational activities. These classification of the MET findings were based on
the Compendium of Physical Activities which was in agreement with those of Julie and Louise
et al., (2005) where they employed the compendium coding (CMET) of estimating physical
activity intensity in a population of older men and women.

**METs of Present Physical Activities**
The present physical activities of the old persons were recorded in three MET intensity
categories. Those physical activities that assumed 0 -3 METs were categorized as light activities;
3 -6 METs as moderate and those greater than 6 METs as vigorous intensity according to the
The home activities category included home keeping and custodial work (cleaning, feeding
animals, and food preparation). In the recreational activities, the check list was tasks like
knitting, art and craft, group discussion, board and card games among others. The mild activities
included sleeping(passive rest) and lying on bed either watching TV, listening to radio or
meditating (active rest), both of which fell in the light activity category (0 -3 METs).Conditional
exercise catered for walking, physiotherapy, mild stretching, home exercise and assisted walking
programs that were available in the three homes for the aged in Nairobi Province.

Figure 3 below indicates that majority of the present physical activities participated in are the
light activities (0 -3 METs) with 50% followed by the 31% of high intensity (>6 METs) and
lastly moderate activities carrying 19%. The 31% participation in high intensity activities could
be attributed to the contribution of Mji wa Huruma in encouraging the residents in taking part in
lawn and garden activities as well as major custodial work that are high intensity.

![Summary of the METs of Present Physical Activities of the Elderly](image)

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**Figure 3: General Description of the METs of Present Physical Activities of the Elderly in
the Homes for the Aged**

Generally, the compendium-coded intensity reported activities classified as light (<3 METs),
moderate (3-6 METs), or vigorous/high intensity (>6 METs) as shown in figure 3. Participants
reported significantly greater time and energy spent in light (50%) and vigorous (31%) activities,
and less time spent in moderate (19%) activities. This finding is in agreement with that in the
American study by Louise et al., (2005) which used the compendium-coded intensity of daily
physical activities where the respondents reported greater time spent in light and vigorous
activities, and less time spent in moderate activities.
The results could be explained by the fact that Kariobangi and Little Sisters of the Poor were found to hire caregivers who do most of the home activities with little input from the elderly residents. As a result, the old people have a lot of time at their disposal to engage in recreational and mild activities that majority contributes to the light (0-3 METs) activity category.

DISCUSSIONS OF THE FINDINGS

The mean of the METs of the means of past physical activities of the 144 old adults studied were $6.5 \pm 0.8$ METs meaning that 57.62% of the population fell between these two limits. The rest 42.38% fell on the extreme sides. For the mean of the METs of the means of present physical activities, 63.18% of the population fell between $1.8 \pm 0.9$ METs. The rest 36.82% fell on the extreme sides.

These figures show that there was an obvious significant difference between the METs of past and present physical activities of the elderly in the homes for the aged in Nairobi Province. The mean of the means of the METs of past activities ($6.5 \pm 0.8$ METs) were higher than those of present activities ($1.8 \pm 0.9$ METs) possibly due to the aging process that decreased the functional capacity of the elderly in the selected type of physical activities. It is also possible that the entry of the old persons into the homes reduced their involvement in higher activities (farming, animal keeping and housework).

The reduced participation in the physical activities in the homes for the aged could also be illuminated from a psychological angle. Some research by Cobin and Pangrazi (1996) show that older adults have attitudes toward physical activity that make it highly unlikely that they will engage in appropriate fitness-related pursuits especially when they are institutionalized. That is, older adults tend:

- To have excessive fears about participation in activity.
- To underestimate their physical capabilities, and
- To overestimate the value of the light, infrequent activity in which they engage.

Another possible explanation to the reduced performance of the elderly in physical activities could be attributed to reduced nutritional intake with age as established by gerontologists. For instance, Gibney et al., (2003) writes that physical activity has been associated with greater energy intakes and subsequently nutrient intakes and quality of life in the aged. This results in a higher plane of energy nutrition. Many studies have shown energy intake declines with age, making a nutritionally adequate diet more difficult to achieve.

World Health Organization (2000) confirms that proper nutrition is important to health. When exercising it becomes even more important to have good diet to ensure the body has the correct ratio of macronutrients whilst providing ample micronutrients; this is to aid the body with the recovery process following strenuous exercise (WHO, 2000). With increase in age however, the elderly have feeding complications as a result of gastrointestinal and teeth problems that tend to reduce their food intake. This nutritional element could in turn be responsible for the difference in activity performance by the elderly in past and present physical activities.

CONCLUSIONS AND RECOMMENDATIONS
It is concluded that the overall effects of ageing result in the decrease of a person's physical fitness levels thus taking a toll on the functional capacity (mental, physical, social and psychological) of the individual in physical activities as established in the homes for the aged in Nairobi Province.

RECOMMENDATIONS
Based on the findings of this study, the following recommendations which have implications for policy changes as well as further research are made.

The administrators should positively capitalize on the talents and capabilities of the elderly in recreational and occupational activities like Performing and Creative Arts; Recall spontaneity in expressions - proverbs, sayings, poetry, song, dance, narrative; Music making by older persons; Material art carvings, weaving, painting and drawing. These artistic activities promote creativity and social cohesion. Other forms of occupational activities include basketry, knitting, shoe repair, barberly, animal husbandry, gate keeping and chefs among others.

Institutional administrators in conjunction with health specialists should strive to carry out occasional assessment of physical activity involvement by the elderly. The assessment can be used to determine a baseline level of functioning that can monitor improvement in performance of elderly-friendly physical activities over time. The Compendium of Physical activities (Physical Activity Log Book) and Barthel Index can be helpful standardized instruments for such follow-up studies.

Walking, running, swimming, stretching and cycling are large muscle rhythmic aerobic forms of exercise that were an integral part of the early years of most adults' lives. Maximizing both the quality and quantity of life in older adults is best accomplished by adding these activities to an individual's habitual lifestyle. For the reason that these activities have been shown to increase joint range of motion. Also, lower intensity aerobic activities, such as walking, standing, and stationary cycling at 60% of maximal predicted heart rate, have been associated with modest improvements in cardiovascular efficiency and mobility tasks (walking, standing from a chair, etc).

REFERENCES


