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PHYSICAL ACTIVITY LEVELS AND HEALTH PROFILES OF ADULT WOMEN LIVING IN INFORMAL SETTLEMENTS

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ABSTRACT

This study investigated the physical activity levels and health profiles of adult women living in the Mmasechaba informal settlement in Gauteng. Apart from the questionnaire, anthropometric measurements were recorded and body mass index and waist-to-hip ratios were calculated. The results indicated that the incidence of lower back pain (74.1%) was the highest hypokinetic disease pathology demonstrated and a number of biomechanical factors are implicated. The daily physical activity levels of these women were fairly high (180 minutes). These activity levels include 30 minutes of vigorous activity consisting of chopping wood, carrying and lifting water. The other 150 minutes per day was spent on mild to moderate activity consisting of cleaning the house, walking to work and doing other chores around the house. In addition, about two hours a day was spent on passive recreational activities such as socialising and watching television. The study strongly recommends that educational programmes must be put in place to increase the awareness of health and dietary problems that exist among these communities.

Key words: Informal settlement; Physical activity; Health; Hypokinetic diseases.

INTRODUCTION

Urbanisation in South Africa has resulted in many Black people moving from the rural areas to cities. This is a universal problem known to many developing countries. Hence, the rapid increase in the number of 'shack dwellings or informal settlements' which is a relatively new development in South Africa. A shack dwelling can be described as a roughly built shed or hut, usually with scrap wood, corrugated iron, and or any scrap building material.

Some of the recent work in urban research regarding informal settlements in South Africa was done in Durban. Cross (1996) did a study on the size and distribution of the shack population, and the working of urban informal land markets. It was indicated that in the Durban Metropolitan area, informal settlement dwellers account for a quarter of the 2.3 million population. This finding was also recorded in the 1990 national census data for informal settlements.

People who live in informal settlements lack sporting facilities, however, cultural norms further interfere with women and exercise. Certain Black societies believe that exercise is only for men and that if women exercise, they will not be able to bear children. This finding is supported by Brehm and Iannotta (1998), who argue that women were instructed to avoid physical activity for fear of uterine displacement, spinal shock, hardened abdominal muscles, and an inappropriate diversion of the 'vital energy' critical for the reproductive function.

Physical activity, however, is important for the prevention and management of hypokinetic diseases such as hypertension, lower back pain, coronary artery disease and diabetes mellitus.

The purpose of this study was to determine the physical activity levels and health patterns of adult women living in informal settlements and to establish if there was a relationship between the physical activity patterns and health profiles in this population.

Studies on populations in informal settlements are not well documented, and yield little information on the role that physical activity has on the inhabitants' lifestyle and health.

Internationally, the Hillary Commission (1997) funds most of the sports trusts in New Zealand which promote fitness activities and assist in getting people active in their communities. Special emphasis was placed on older people, women and disabled persons. In 1997 the Commission worked with health agencies to provide advice and service about sport and physical activity, and encouraged doctors to prescribe exercise to their patients (Hillary Commission, 1997). In a survey conducted by the commission in 1996, people were asked about the physical activities they had done in the past year (1995). Forty five per cent of the women indicated that short walks were part of their daily activity, 43% indicated that long walks were part of their activity and 22% exercised at home (Hillary Commission, 1997). The statistics of the New Zealand population indicate that their physical activity patterns are higher than in most countries. The incidence of women exercising is also significantly higher. A similar study, if undertaken in most developing countries in Africa, could highlight the physical activity of the population, and set up programmes to improve health.

In South Africa the combination of urbanisation and informal settlements poses a greater risk to Black women and men.

Seedat (1982) conducted a random house to house survey in the Durban area, with respect to the prevalence of primary hypertension according to the WHO criteria. The finding for age-corrected prevalence of hypertension in the different ethnic groups in Durban was 25% for Zulus (Blacks), 17.2% for Whites and 14.2% for Indians. The conclusions of the study indicated that 58% of the Indian population had undiagnosed or inadequately treated hypertension. The high incidence of IHD (ischaemic heart disease) among Indians and Whites of South Africa and the low incidence among Blacks, suggests that there might be different thresholds for the susceptibility of disease in various ethnic groups, beyond which the risk factor begins to operate. In a recent investigation by Schuman (1999) on the coronary risk factor profiles of black executives at Eskom, found that these subjects exhibited a higher than normal risk of developing coronary heart disease.

Steyn *et al*. (1991) did a cross sectional study of risk factors for IHD in a random sample of 986 Black people aged 15 to 64 years, living in the Cape Peninsula. Areas that were covered included Khayelitsha, New and Old Crossroads, Nyanga, Langa and Guguletu. The type of dwelling included houses and shacks. Participants in the study completed a risk factor and dietary questionnaire. The questionnaire covered aspects of urbanisation, socio-economic items, smoking habits and physical activity patterns. Anthropometric and blood pressure measurements were recorded.

The results indicated that more females than males were overweight or obese, with a mean BMI (body mass index) of 27.8 for females and 23.4 for males. Of those who worked, 42.6% of males and 27.3% of females were involved in minimum physical activity at work; 37.8% of males and 34.5% of females participated in no exercise outside working hours. The overall risk profile identified in the study showed that the Black urban male population of the Cape Peninsula already had considerable IHD risk. About 30.8% of males aged 25 years and above had at least one risk factor. In the oldest age group (55-64 years), among both men and women, more than half the participants had at least one IHD risk factor (Steyn *et al*., 1991). Among males, the bulk of the risk was due to the smoking of cigarettes, while among females, the biggest contribution to the profile was made by hypertension. Steyn *et al*. (1991) concluded the that epidemic of IHD and CVD (cardiovascular disease) as seen in White, Asian and Coloured South Africans, could still be prevented in the Black population, but preventative measures have to be rapidly instituted.

A study by Moodley *et al*. (1997) researched the prevalence of ischemic heart disease (IHD) risk factors in an urban workforce in the Eastern Cape. The results of this study indicated that urban men were at high risk for IHD. Further, if intervention programmes were not introduced at the workplace, IHD would reach epidemic proportions in this sample.

Most of the studies (Steyn *et al*., 1991; Moodley *et al*., 1997; Seedat, 1989) on the disease profiles for different racial groups in South Africa indicate that Blacks were at lower risks compared to the other racial groups. The researchers, however, argues that these profiles have been altered over the years. More Black people are moving into highly industrialised areas and jobs that are highly demanding. Lifestyle changes are affecting the Black population today more than in the past ten years. Thus the emergence of many of the hypokinetic diseases because of poor lifestyle habits will come to the fore in this population. This was supported by Seedat (1989), who indicated that 25% of the urban Blacks had hypertension as compared to 10% of rural Blacks.

METHODS

Two hundred and twenty six women volunteered and consented to participate in this study from the Mmasechaba informal settlement on the East Rand, Gauteng. A health and lifestyle questionnaire was administered to a randomly selected cohort to obtain information concerning health profiles, dietary habits, physical activity levels and recreational patterns.

Standardised methods were used to determine height, weight and girth measurements. The waist-to-hip ratio was determined according to the method described by Van Itallie (1988). The body mass index (BMI) was computed from the Bray and Gray (1988) method. Inferential and descriptive statistics was analysed using a computer statistical package (Statistical Analysis System).

RESULTS AND DISCUSSION

The total number of women that participated in this study was 226, however, 21 of them were pregnant and their results were excluded for analysis. The main reason for not analysing their results was that there are no reference norms to compare these women with. The results were

discussed under the following headings: namely, demographic profiles, anthropometric profiles, physical activity levels, health profiles, dietary patterns and social patterns.

Demographic profiles

The demographic profiles that were discussed were age, marital status and the number of children the women have. The age groups were divided into five categories. The 18-29 years age group accounted for a greater percentage (60%) of participants. The distribution of the age groups is depicted in Figure 1.

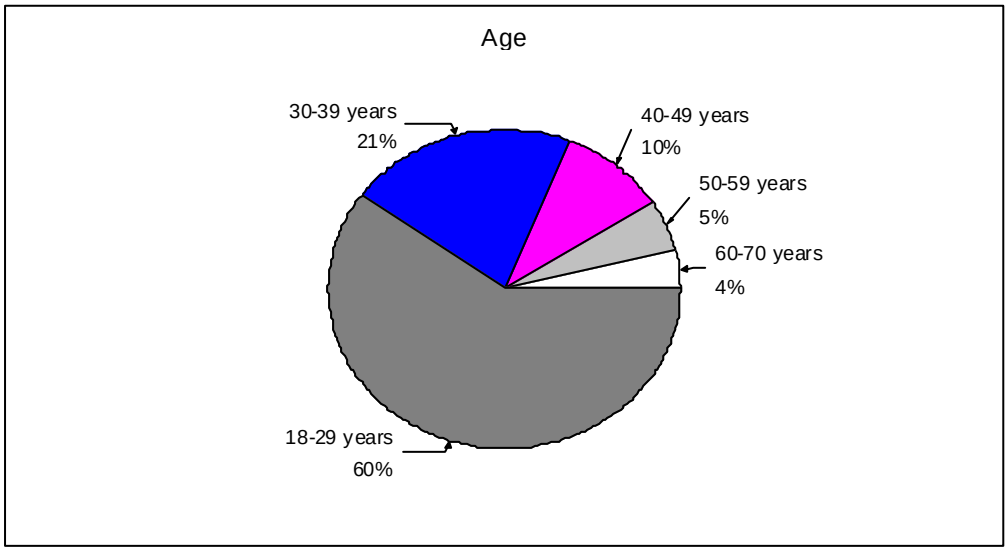

FIGURE 1. **AGE DISTRIBUTION OF THE SAMPLE STUDIED**

The question on the number of children the women have was included in the questionnaire because of its major effect on the activity patterns of women. Women with children spent most of their time rearing their children, which left little time for physical activity.

Anthropometric profiles

The anthropometric profiles included the calculation of the Body Mass Index and the waist-to-hip ratio to determine the risk profile of these women and their susceptibility to diseases. As indicated by Lambert (1988), BMI values of 26-34 indicate moderate obesity, while BMI values of 35 and over indicate severe obesity. The BMI values are depicted in Table 1.

TABLE 1. **BMI VALUES OF THE WOMEN**

BMI values	%	Classification
<25	39	Normal
26-34	46.3	Moderate obesity
>35	14.7	Severe obesity

The girth measurements of the waist and the hip were used to calculate this ratio. A high waist-to-hip ratio indicates an increased abdominal adipose distribution, whereas a low waist-to-hip ratio indicates an increased femoral adipose distribution. The percentages of adipose distribution of the sample studied are indicated in Table 2.

TABLE 2. **PERCENTAGES OF WAIST TO HIP RATIO OF THE SAMPLE**

Ratio	**%**
>0.85	16.2
<0.84	83.8

These ratios indicated that 16.2% of the women were at risk compared to 83.8% who had a ratio of less than 0.84. As indicated by the BMI values, the percentage of women who were at high risk was less than 17%, which may be lowered if these women receive nutritional intervention and proper education on the positive benefits of exercise and physical activity in their lives. Abdominal and femoral adipose distribution were visible features in the older women. These women believed that being fat was normal for a Black female.

The correlation coefficient was also calculated to determine the relationship between BMI, waist-to-hip ratio and weight. The relationship was calculated at the 5% level of significance. The results indicated a relationship of 0.9 between BMI and weight, 0.15 between BMI and the waist-to-hip ratio. The relationship between weight and the waist-to-hip ratio was 0.13. The statistics indicated that BMI had a strong correlation with weight, as can be expected.

Physical activity levels

Chopping wood may impact positively on the subjects, as they must have a good arm and grip strength to be able to use an axe effectively. Also, being alert and having good co-ordination is required when chopping wood because of the dangers that are involved if these factors are ignored.

The strength levels of the women in the study are further confirmed as they carry many litres of water on their heads. The fact that water would have to be lifted in order to be placed on their heads or in wheelbarrows, indicates their strength index. Further, 20 litres of water is equal to 20 kilograms in weight. Thus a fair amount of strength training is occurring on a daily basis. However, incorrect technique could limit the exercise, because of premature back pain. Cress (1994) argues that certain activities involve high intensity levels e.g. chopping wood, whereas making a bed requires certain levels of arm and grip strength.

Eaton *et al*. (1989) believes that women during the stone-age were gatherers of food, which appears to apply to a minor extent in this population. The present study shows that much of the women's time was spent maintaining households, preparing food, sewing clothing, visiting nearby townships or engaging in a variety of leisure activities such as dancing. These activities indicate that the women's physical work in this society has been well characterised by the daily chores they perform e.g. collecting food, carrying heavy loads of water or firewood (often while carrying a child), walking long distances and dancing vigorously,

sometimes for hours (Eaton *et al*., 1989). The physical activity patterns of women in the Mmasechaba informal settlement, who participated in this study, could be rated as higher than most urban female populations.

The physical activity patterns included lifting, collecting wood, fetching water, household chores and cooking. The physical activity patterns of these women indicated that on average, a typical informal settler engaged in the following activities on a daily basis:

- Cleans the house for approximately 100 minutes per day
- Carries water for approximately 10 to 15 minutes per day
- Chops wood for approximately 10 to 15 minutes per day
- Lifts heavy objects (± 20kgs) for at least 4 to 10 times per day
- Walks to work for approximately 60 minutes per day, and
- Watches television for ± 3 hours per day (11.3% of the subjects)

This population under study may be rated as being quite physically active on a daily basis.

Health profiles

The health profiles surveyed included smoking, alcohol consumption, hypokinetic diseases, sleeping patterns and personal health care. The results indicated that 22.4% of the women in this study were smokers, while 2% used snuff. Smoking is also a risk factor for IHD. Of the 22.4% of smokers, 8.3% indicated that they smoked two cigarettes a day, while 6.3% smoked five cigarettes, and 7.8% smoked more than six cigarettes a day. Of the 205 women, 68 (33.2%), indicated that their partners did smoke, compared to 22.4% of the women who were smokers.

The prevalence of alcohol consumption among this population was 14.1%, while 85.4% were teetotallers and 0.5% took traditional beer once in a while. Their alcohol consumption habits were compared to those of their spouses, with results indicating that 36.1% of the spouses consumed alcohol as compared to 14.1% of the women.

Socio-economic status and level of education may be major factors that contribute to the prevalence of smoking and drinking in this community. These women were always at home, sometimes with their spouses. They did not have stable jobs to keep them busy, and, often met in groups to consume alcohol and smoke, to help while away the time. It is reasonable to assume that if there was a recreation programme provided for these people within their living areas, perhaps the level of alcohol and smoking would be reduced. This would reduce health related problems resulting from cigarette smoking and alcohol abuse. Some form of educational programme should be set up to improve the primary health care of these individuals. With the introduction of some form of primary health care programme, there would be a reduction in health care cost, for the state.

In this study, lower back pain was the most prevalent among the subjects (74,%) (Table 3). There are a number of factors that may contribute to this problem, which appear to be related to:

- Incorrect posture
- Incorrect methods of doing household chores e.g. lifting mechanics
- Carrying 20-25 litres of water on the head while carrying a baby on the back, and
- Sleeping on an uneven bed/surface (floor)

This is similar to results presented by Jamal (1989), who indicated the following as the risk factors for lower back pain:

- incorrect posture
- incorrect bending and lifting habits
- obesity
- lack of exercise
- lack of proper rest
- tension and stress related backache
- colds, flu and other illnesses

Jamal (1989) further states that most back pain is due to wear and tear, causing degenerative changes in the discs and joints of the spine. It was indicated that trouble arose from the area of the spine subjected to the heaviest mechanical stresses because of bad postural habits or incorrect lifting and bending of legs e.g. poor mechanics in lifting objects. Chopping wood may be another factor that contributes to the high level of lower back pain in these women. Correct body mechanics in the execution of daily chores may reduce the incidence of lower back pain. Most of these women chop wood daily. However, they do so with straight legs, thus creating extra strain of the lower-back and precipitating lower back pain. The positive effect of the household chores and the chopping of wood daily increases the physical activity levels of these women, which may retard or reduce the effects of hypokinetic diseases.

In the disease profile of these subjects it is clear that asthma, diabetes, tuberculosis showed a low incidence (less than 2%), while hypertension is recorded at 17,% (Table 3). A possible reason for the low incidence of diabetes (2%) and hypertension (17.%) could be that most of the subjects (60%) were between the ages of 18 and 29 years. The activity patterns of this group are still quite high, and may serve as a preventative factor. As these women age, their physical activity patterns decrease, so there would be an increase in degenerative diseases.

TABLE 3. **DISTRIBUTION OF HYPOKINETIC DISEASES AND OTHER PATHOLOGIES**

PATHOLOGY	NUMBER OF SUBJECTS	%
Diabetes	3	1.5
Hypertension	35	17
Lower back pain	152	74
Asthma	4	2
Tuberculosis	3	1.5
No pathology	8	4

Dietary habits

The staple diet of the women was large quantities of bread, pap, meat and tripe. These are typical dietary components of a township meal. This type of diet was followed by about 80% of these women. Tripe was seen as cheap 'meat' containing proteins and fats. However, these families were ignorant of the fat content of tripe. Morogo was favoured as a vegetable and like tripe, it was very easy to acquire and is cheap. Morogo was used as a substitute for spinach. Potatoes and cabbage were other vegetables preferred by these women, with soft maize porridge eaten for breakfast. Most (50.7%) of the women in the study indicated that they had three meals a day. 33% had two meals a day, 10.5% had more than four meals a day, while 5.0% indicated that they sometimes survived with one meal a day. 0.5% sometimes survived without any meals.

Their diet is high in fat. The cooking methods included using large quantities of oil for frying eggs, meat or chicken livers. Samp and rice was also cooked with oil and 81.5% of respondents indicated that they re-used their oil. Used cooking oil develops greater levels of hydrocarbons, especially if re-used often. This impacts negatively on cardiovascular health. It could be argued that these women could reduce their obesity levels by modifying their diet and eating less fat in their diets.

An education programme could be implemented, in which these women may be taught how to wisely prepare meals in the most economical manner, which is also nutritionally sound and healthy. The women should be educated to go back to their roots and continue to prepare vegetable dishes with a minimum of meat as their forefathers did. The risk of hypokinetic diseases was far lower for their grandparents than in the current generation.

Social patterns

The major social aspect in most of the Black communities constitutes the 'stokvel'. Members of a stokvel get together on a monthly basis. Each month different individuals host it at their home and each member pays a certain amount as a contribution. The host gets the total amount paid by all the stokvel members. This is a form of active recreational activity as it involves dancing. It is also a form of income for the host. However, in the study population, not all persons could be involved in stokvel activities, as many are unemployed and do not have the economic backing to participate. Many may attend, however, with no financial gain. For most of these settlers, their income is so low that it hardly allows for day to day survival. Without any governmental intervention, they would not be able to afford a house or improve their living conditions substantially. This in the long term, impacts negatively on their psychological and physiological well-being, education standards and health status.

The other form of socialising in these communities is standing at the fence and sharing views and ideas with the neighbours. This form of socialising has proved to be a stress reliever, as by sharing their problems with other people, the women's health and mental well-being improves. Sharing alcohol and cigarettes appears to be another popular method of socialising in this community. Clearly, a recreational centre should be built which may encourage other positive methods of socialisation, such as the formation of youth clubs and women's groups.

CONCLUSIONS

The results of this study confirm that women living in informal settlements have high daily levels of physical activity. Most of them carry water, chop wood, clean the house and walk to work on a daily basis. Thus, the average informal settler is involved in approximately 30 minutes of vigorous activity (chopping wood, carrying water) and is engaged in 150 minutes of mild to moderate activity (cleaning the house, walking to work). It was estimated that an average woman at the Mmasechaba informal settlement expended approximately $\pm$1350 kcal of energy daily (McArdle *et al*., 1991).

The hypokinetic disease profile of the women indicated that lower back pain in particular should be looked at by health professionals at the local clinic. The most suitable way to achieve this goal would be to educate them on correct lifting mechanics, sleeping patterns, and the balancing of the weight of water on their heads with babies on their backs. Educational programmes on health and lifestyle changes have been recommended by various researchers to inform communities about diseases and changes in lifestyle (Mayet, 1982; Seedat, 1982; Rossouw *et al*., 1983; Sewdarsen, 1987). Sixty one percent of this population ranged from moderately to severely obese, which would at some time in their lives impact negatively on their health. This is a major risk factor for hypokinetic diseases, including diabetes, heart disease and hypertension. Already, there was 17% incidence of hypertension in this population. The waist-to-hip ratio further confirms this risk, with 16.2% of the subjects having visible abdominal and femoral adipose tissue distribution, mainly visible in the older women. The 74% incidence of lower back pain in this population is epidemic.

It was further concluded that these women were at the crossroads with respect to health and activity. Generally, their activity levels were higher than most South Africans. However, their eating habits, the stress of living, and poor body mechanics placed them at extreme risk for developing health problems which were not related to activity patterns.

RECOMMENDATIONS

It is recommended that education and support programmes should be conducted by nurses in the local clinics to assist in creating awareness on certain hypokinetic diseases and lifestyle changes. The employing of biokineticists at such clinics may assist in this education programme. All Departments of Human Movement and Sport Science at tertiary institutions should 'adopt' an informal settlement within their precinct as one of their outreach projects. The recently established Working Group on the Standardising of the Measurement of Physical Exercise in South Africa should conduct more research projects on the informal settlers to ascertain their physical activity levels.

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