

FACTORS INFLUENCING SEDENTARY LIFESTYLE PREVALENCE AMONG WORKERS IN SELECTED INSTITUTES IN KENYA AGRICULTURAL LIVESTOCK AND RESEARCH ORGANISATION

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Abstract

People who spend too much time being sedentary are more likely to develop musculoskeletal disorders and other non-communicable diseases (NCDs), a health risk likely to increase with increasing sedentary office setting and lifestyle. In Kenya, sedentary lifestyle is on the increase while its base line data has not been documented appropriately. This study investigated factors influencing sedentary lifestyle prevalence among workers in selected institutes in Kenya Agricultural and Livestock Research Organisation (KALRO). The study concentrated on a population of 820 office and laboratory workers in seven KALRO institutes located in Nairobi Metropolitan. The sample size (n= 96), was calculated using Daniel's formula for prevalence studies. Cross sectional survey was employed and objective questionnaires were administered. Factors influencing sedentary lifestyle were, use of motorized transport (79.4%), screen time (64.7%), delegation of all house chores to house helps (56.5%) and occupational (78.4%). The study concluded that most of these factors were outside the workplace setting and that they played a role in the prevalence of sedentary lifestyle among KALRO employees in the selected institutes resulting to overweight, central obesity and related ailments. These findings provide a basis for management in KALRO to encourage physical activity among its workers by intervening at individual, environmental, and policy level.

Key words: musculoskeletal, obesity sedentary, prevalence, KALRO

1.0 Introduction

A sedentary job is characterized by one requiring much sitting with little or no exercise (American Heritage Dictionary, 2016). Most of the sedentary jobs are the white collar jobs, a cohort which majority of Kenyans associate with hefty pay checks and prestige (Christine, 2010). This category of workers is at a greater risk of low occupational physical activity and high sedentary time (Smith *et al*, 2016) and are more likely to develop chronic conditions and other non-communicable diseases (NCDs). In Kenya, the fight against these diseases which account for 27% of deaths suffered by those between 30 and 70 years is complicated by cultural factors including the perception of overweight and obesity as a sign of prosperity associated with white collar jobs (Shi, 2015). Further, the actual burden of these diseases is poorly understood and people don't know that they suffer from the condition and

therefore don't seek treatment (Stuart Ali and Fransesc Xavier, 2017). This lifestyle among white collar workers both at work and at home has been on the increase while baseline data on sedentary lifestyle has not been documented appropriately and may not be nationally representative or accurate (Kenya Stepwise Survey for NCDs report, 2015). Consequently, absenteeism, loss of man hours and insurance premiums have increased due to associated lifestyle diseases (March and Mclennan, 2017).

A study carried out in Nigeria on prevalence of physical activity among adults in a metropolitan Nigerian city by Adewale et al, (2015), revealed that the proportion of adults that met the WHO recommendations and guidelines of physical activity among Nigerian adults varied significantly by socio demographic characteristics and that those who were divorced /separated, did not own a car, and had a lower social economic status, low education level and blue collar occupation were likely to be physically active. Factors that promote sedentary behaviour include leisure, transportation, housework and occupation domain (Lina et al, 2016). Out of the four domains, leisure, transportation and house work happen outside the workplace. According to Murtagh et al, (2017) interventions targeting outside of workplace setting may be at individual level (behavioural change after learning through seminars/counselling about health risks associated with sedentary lifestyle), environmental level (limiting TV viewing by installing lockout systems that prompt change of behaviour) and policy level (providing prompts and invitation to encourage standing events). On transportation domain, Owen et al, (2011) argues that, use of cars in the suburban areas has lengthened the period of sedentariness which refers to the amount of time spent sitting in the cars to perform a journey to and from workplaces and short journeys to attend to demands of family and friends. Further on occupation domain, employers should ensure that their workers do not spend significant amount of time sitting as a way of providing a safe system of work (Allana, 2018). However, the level of implementation of these health services in most of the countries with expanding economy is low (Mrema et al, 2015). Globally, the content and multidisciplinary nature of occupational health services corresponds to international guidance but the coverage, comprehensiveness and content of services remain largely incomplete due to lack of infrastructure and shortage of multi- professional human resource (Rantanen et al, 2017). In Kenya, the Occupational Health and Safety Act, 2007 is not explicit on duties of the employer in reduction and prevention of sedentary lifestyle described by the World Day of Safety and Health at Work, (2015) as a new hazard fuelled by the growing use of computers and automated systems. This study was set to investigate factors influencing sedentary lifestyle prevalence among office and laboratory workers in selected institutes in Kenya Agricultural and Livestock Research Organization (KALRO). The study focused on this cadre of staff because office and laboratory occupation is characterised by sedentary behaviour.

Metropolitan or urban setting has an influence on sedentary lifestyle and adolescents from urban settings are more likely to be overweight and obese as advocated by Xu *et al*, (2010). This coupled with the proximity of the selected institutes informed the decision to choose Nairobi Metropolitan region as the study area.

2.0 Materials and Methods

The study area covered seven KALRO institutes (selected from those that are located in Nairobi Metropolitan) out of seventeen with a population of 820 workers in offices and laboratories. The sample size, $n = 96$ was calculated using Daniel's formula for prevalence studies (Naing *et al*, 2006). $n = NZ^2P(1-P) / d^2(N-1) + Z^2P(1-P)$ where N was the population (820); Z was the statistic for a level of confidence (1.96); P was the expected prevalence (50%); and d was the precision (9.6%).

Cross sectional survey was employed and structured objective questionnaires were administered. Random sampling was employed in the selection of participants. Factors influencing sedentary lifestyle which included leisure, transportation, housework and occupation were in form of self – reported data on physical activity and sedentary behaviour at work and home. Data was processed using statistical package for social sciences (SPSS- Version 20) and MS Excel computer software. Analysis was done using frequencies and statistical tests. The data was also subjected to statistical correlational tests to determine relationships between independent variables. Kendall tau (τ) was used to check similarities in data collected. Data was presented using tables and charts.

3.0 Results and Discussion

3.1 Respondents demographic profile

The social demographic profile revealed that the respondent's gender was 46.3 % male, 50% female, 3.7% non-response while 57.4% were married, 33.3% single, 5.6% widowed 1.9% separated and 1.9% nonresponse. The respondent's level of education was 92.6% college and above with 55% of them working in the office, 42 % in laboratories, and 3% serving in the field. Notably, 65% of the respondents were 45 years old and above while 55% were earning Kshs. 46,000 per month and above. The target respondents in this study was 96 but only 54 or 56% returned the questionnaires. This was considered to adequately represent the view of the respondents. If data is 53% or more it is adequately representative (Babbie, 1995).

3.2 Association between respondent's age and how they commuted to work

The study sought to know how the respondent's age related to how they commuted to and from work. From the results, it was evident that as they advanced in age, the tendency was towards motorized means to and from work as indicated in the figure below:

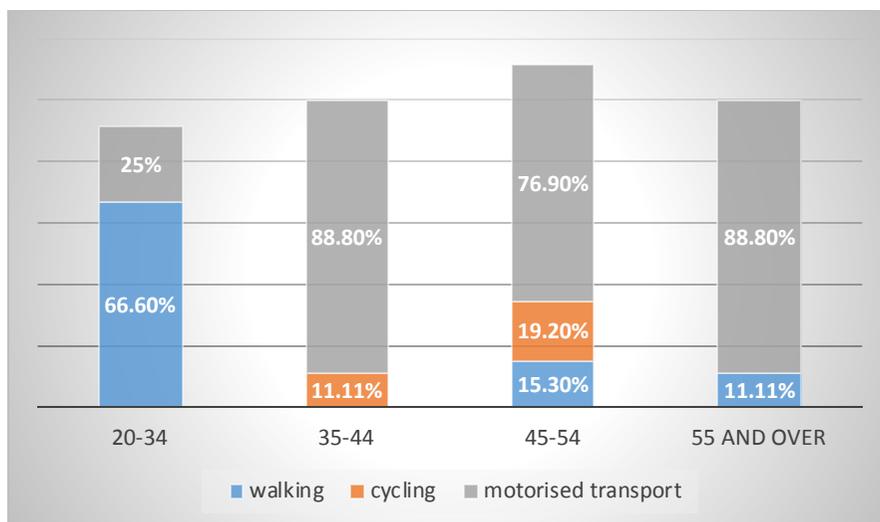


Figure 1. How respondents commuted to and from work

It was observed from the results that those aged between 35 and 44 years or the middle age were either cycling or using motorized transport and did not walk to and from work. This was in agreement with a study by Kelly *et al*, (2018) which stated that physical activity (PA) declines during mid-life were characterised by reduction in light intensity PA with increases in sedentary time. In a study on cycling and walking for individual and population health benefits (Public health England, 2018) it was evident that cycling and walking have the same health outcomes and that the former is a good example of moderate to vigorous PA. Most of the older respondents (≥ 55 years) also used motorised transport to and from work. This was indicative that indulgence in physical activity reduced as respondents advanced in age. Studies have shown that in older individuals, increase in body weight is not simply due to increase in energy intake but significant reduction in energy expenditure due to sedentary lifestyle (Pouran *et al*, 2015). Further, the results were in agreement with a study on physical inactivity prevalence and trends among Mexican adults by Medina *et al*, (2013) which revealed that adults in obese category, 60-69 age group, and those in highest economic status were more likely to be physically inactive. Abubakari *et al*, (2009) study on prevalence and time trends in diabetes and physical inactivity among adults in West African population also found an association between physical inactivity, being older ($>$ or $=50$ years) and urban residence.

3.3 Association between respondent’s income per month in Kenya shillings and how they commuted to and from work

The cross tabulation of the respondent’s income per month against how they commuted to and from work indicated that those earning more than Kenya shillings 46,000 used motorized transport.

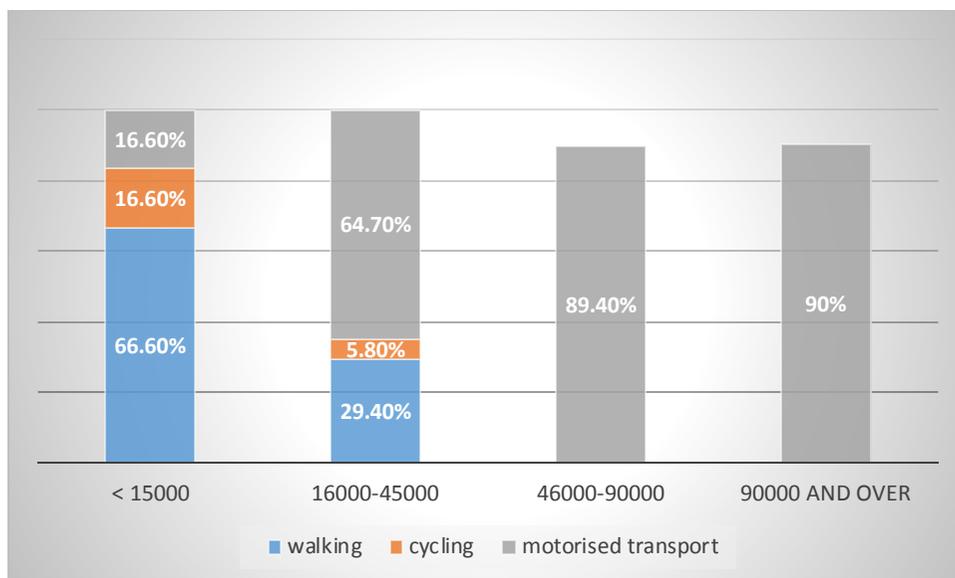


Figure 2. Respondents' earnings per month against how they commuted to and from work

From the data, it was observed that those with an income less than Kenya shillings 15, 000 walked to and from work (66.6%), while those with income of Kenya shillings 46,000-90,000 and above used motorized transport. This indicated that use of motorized transport among the respondents increased with earnings and socioeconomic status. For respondents earning less than Kenya shillings 15, 000 the data was normally distributed about walking. This was indicative that walking was their preferred means of transport. Those earning from Kenya shillings 16,000-45,000 were negatively skewed toward none- motorized transport. For all income above Kenya shillings 46,000 data was skewed toward motorized transport and those with income above Kenya shillings 90,000 all drove their own car to and from work. The observed excessive use of personal vehicles to and from work among those earning Kenya Shillings \geq 90,000 could be attributed to personality traits, or respondents may have become habituated to using cars as observed by Juneman and Mohammad, (2015) in a study on use of public transportation in greater Jakarta. Owen, *et al.* (2011) in a study on adults' sedentary behaviour determinants and interventions, add that in suburban areas, the use of cars has lengthened the period of sedentariness among citizens, which in this case refers to the amount of time spent on sitting in the cars to perform a journey to and from their workplaces.

This data was further confirmed by both p-values of Shapiro-wilk test all were less the 0.05 with the exception of those with income less the Kenya shillings 15,000. This data lead the study to observe that the older respondents earned more and used motorized transport to and from work as compared to lowly paid who walked to and from work.

3.4 Association between the respondents' type of occupation and how they commuted to and from work

The study sought to know how the respondent's type of occupation related to how they commuted to and from work. The data revealed that 94.7% of those in laboratory work and 64.2% of office workers used motorized transport to commute to and from work.

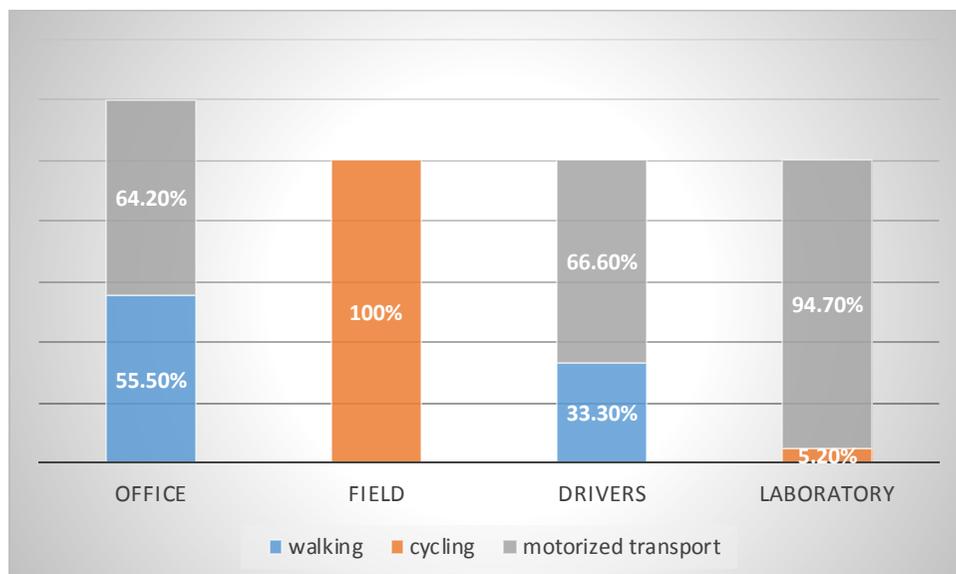


Figure 3. Type of occupation against how respondents commuted to and from work

The study sought to establish the time spent sitting in the cars to perform a journey to and from respondents' workplaces while on motorised transport. The results revealed that 44.6% spent more than 1 hour in traffic. This could be attributed to traffic jams experienced during the peak hours in Nairobi metropolitan region. The long-time taken to commute to and from work added to the respondents' sedentary time. This falls under transportation domain where Owen *et al*, (2011) argues that use of cars in suburban areas has lengthened the period of sedentariness which refers to the amount of time spent in the cars to perform a journey to and from workplaces and short journeys.

Table 1. Motorized transport against how long respondents took to commute to and from work

Time (minutes)	Frequency	Percentage
0	1	1.9
10	1	1.9
15	1	1.9
30	5	9.3
40	2	3.7
45	1	1.9
50	3	5.6
55	2	3.7
60	21	38.9
65	1	1.9
90	1	1.9
120	1	1.9
Total	40	74.1
Did not respond	14	25.9
Total	54	100.0

Statistics for skewness and kurtosis if one used motorized transport and how long they took to commute to and from work revealed a skewness of 0.133 (SE=0.374) and a Kurtosis of 3.172(SE=0.733) proving it was not normally distributed but had significant kurtosis towards spending 60 minutes to and from work.

Further, since laboratory and office work is characterised by much sitting throughout the day, the assessment of occupational sedentary was carried out using the following questions under a section in the questionnaire which sought to know the workplace sitting profile: “How many hours did you work in the last 7 days?”; “During the last 7 days, how many days were you at work?”; “how would you describe your typical work day in the last 7 days? (This involves only your work day and not travel to and from work, or what you did in your leisure time). “Indicate the percentages for sitting, standing, walking, heavy labour or physical tasks”. “Does this form an impression of your monthly daily routine in the last three months?” The analysis of the hours respondents worked in a week indicated a mean of 41.6 hours and a standard deviation of 14.5. The data for how many hours per week had a skewness of -0.935 and a kurtosis of 4.657 showing that it was not normally distributed but had a kurtosis towards working for 40 hours per week. On how many days per week the respondents worked, the data had a skewness of 2.496 and a kurtosis of 10.285 which was indicative that the data was not normally distributed but was kurtotic around 5 days per week. This indicated that most respondents worked an average of 40 hours in a 5 days week.

The analysis on how respondents described their typical working day in the last 7 days indicated that those who worked in the field did not respond to sitting down and driving option. They spent most of their time walking. The results using Shapiro-Wilk showed $p > 0.5$ for sitting for office workers, standing and sitting for laboratory workers. On gender basis, the data revealed that male had a *skewness* of 1.905 for hours worked per week and female had -0.782. The data was skewed for male but approximately normally distributed for female. The *kurtosis* of 2.707 for males and 2.321 for female indicated the data was *kurtotic* for both male and female. For the number of days worked in a week, the results revealed female had a *skewness* of 2.602 with a *kurtosis* of 11.75 for male. This was an indication that for both male and female respondents, the data was both skewed and *kurtotic* which further inferred that the data was independent of gender meaning that both male and female worked 40 hours per 5 days week. Most respondents spent significant time sitting (78.4%) in the place of work as compared to walking within the office/laboratory (15.6%) or lifting heavy objects (6%). This meant that occupational sedentary was high among the respondents. The results were in agreement with Allan, (2018) who argues that on occupation domain, employers should ensure that their workers do not spend significant amount of time sitting as a way of providing a safe system of work.

3.5 Lifestyle trends

The part of the questionnaire assessing the respondents' profile on sitting at the workplace indicated that the respondents were spending too much time sitting in the workplace (78.4%) and that they were working for a *mean* of 41.1 hours in a 5 days week. It was important that the study established whether this sedentary lifestyle followed them at home by assessing how they spent their weekend and leisure time.

The lifestyle trends were indicated by the respondents giving details on how many hours they spent watching television at home after work and how they spent a typical weekend. The results revealed that;

- (a) Most of the respondents spent significant proportion of their weekend watching TV as depicted in figure below;

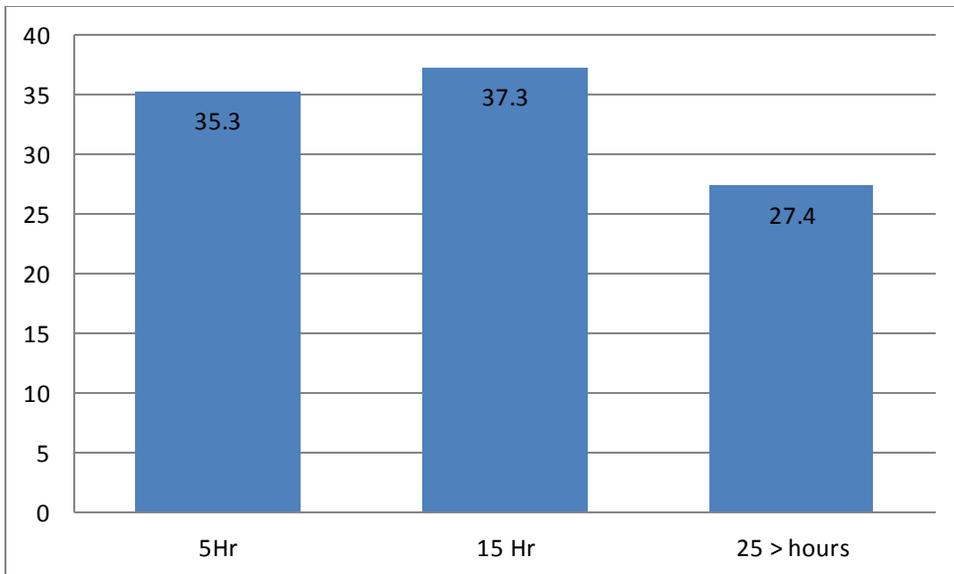


Figure 4. % of time spent watching television over the weekend

Notably 64.7% of the respondent spent over 15 hours in front of the TV on weekends.

(b) Form the results it was evident that 88.5% of the respondents who spent time watching TV did so while lying on a couch as opposed to sitting on an arm chair although inactivity is the culprit whether lying or sitting down. According to Thyfault, (2010) the problem is that we don't use our legs when we sit or lie prone. Our legs and backside contain some of the largest muscles in our body. When we sit in a chair or lounge in a couch, these muscles are slack and levels of blood sugar and bad cholesterol rise adversely affecting the health of the culprits.

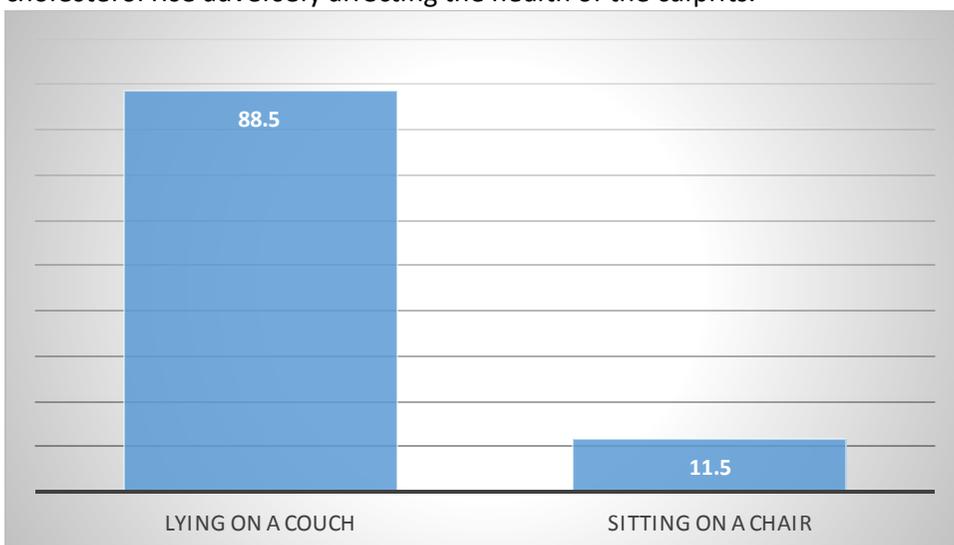


Figure 5. Respondent's sitting mode while watching the TV

(c) Most respondents preferred being indoor, lying on the couch while watching TV. More specifically 68% of respondent confirmed that they spent most of their weekend at home lying on the couch and only 14% and 18 % were involved in physical activity and socialising with friends respectively.

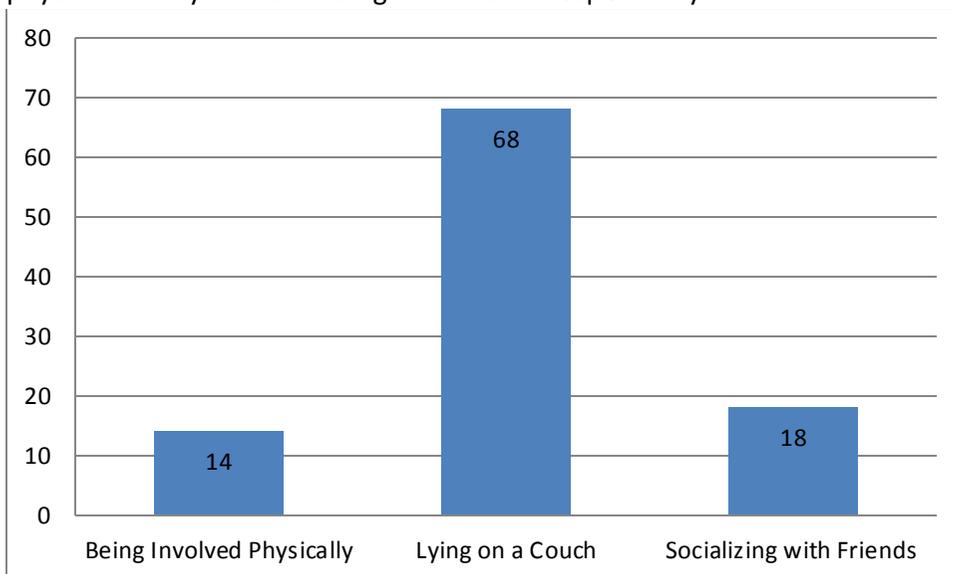


Figure 6: How respondents spent their weekend.

(d) Only 23.1 % confirmed that they used dish washer and washing machine at home. The respondents' level of mechanization of house chores was low both with low and high income cadres.

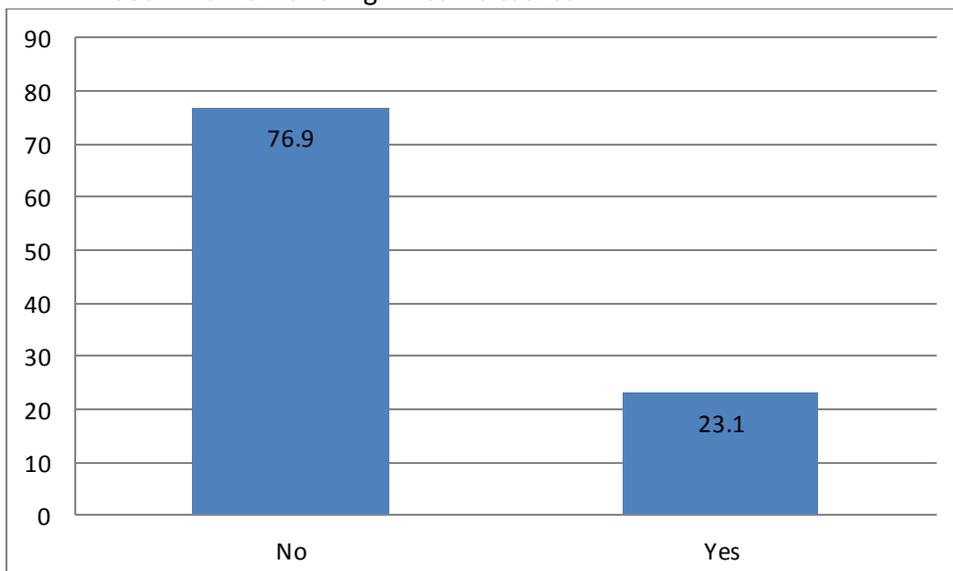


Figure 7. Respondents with dish washer or washing machine at home

(e) On housework domain, the results were as shown below;

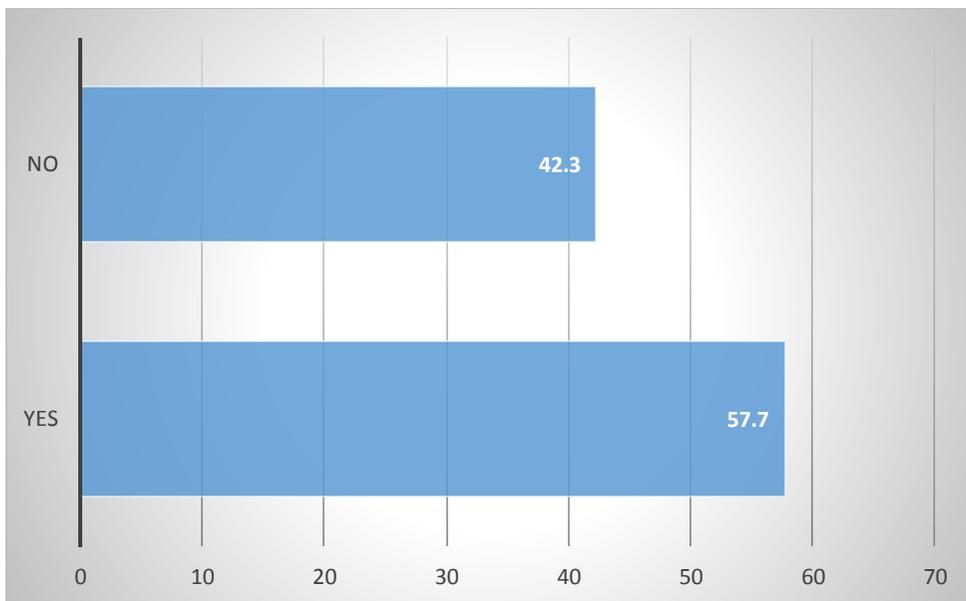


Figure 8. Respondents with house helps at home

In physical activity domains, house chores falls under the four major domains category which includes transportation, occupational and leisure. Kindula, (2014) stated that in Kenya, nearly everyone, except the very poor, hires domestic help. A study by Alex *et al*, (2006) on practice of physical activities and associated factors in adults in Brazil found out that the proportions of active individuals were, (14.8%) leisure, (38.2%) occupational, (11.7%) transportation, and (48.5%) household chores. This was in agreement with the results of this study as it was observed that, (57.7%) of the respondents delegated all their house chores to house helps after spending significant time (78.4%) sitting in the office and (44.6%) in the traffic for more than 60 minutes. Kirigo, (2012) confirms such lifestyle reduces use of their large muscles, back trunk and legs hence reduction of the body intake of sugar and fats thus increasing their health risk and tendency to develop obesity. Kirigo, (2012) further argues that those who spend a lot of time sitting down have a predisposition of having blood clots, developing a bad posture and frequent fatigue and muscle soreness. Further, the researcher deduced that KALRO employees in the selected institutes were sedentary and were at risk of developing type 2 diabetes and cardiovascular disease.

Spearman (-0.451) revealed that there was a negative correlation at- 0.01 significant level. This indicated that those respondent who earned higher income were the ones who had dish washers and washing machines. However, among the respondents, spearman p value of (-0.659) revealed significant negative correlations among the respondent. This indicated that as the respondents earned more they

acquired house help to do all their house chores. The research showed that KALRO employees in the selected institutes used house help as compared to using mechanized methods of cleaning clothes and dishes and the ones who had high income (> 46000 making up 56.5%) are the ones who employed house help to perform their house chores as shown in the figure below;

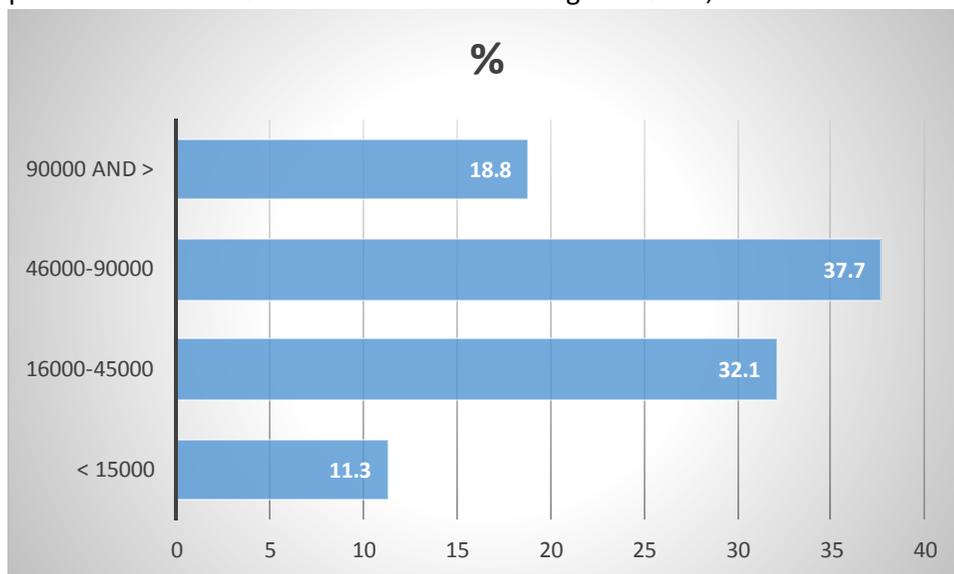


Figure 9. Cross tabulation of respondents using house help to perform house chores against earnings

3.6 Medical history and work influences trends

The study sought to know the respondents medical history and whether they had ailments related to sedentary lifestyle. The analysed data indicated that respondents suffering from chronic low back pain (LBP) after a day’s work in the office or laboratory were 52%. Respondents suffering from fatigue and muscle soreness after a day’s work were 72.5% while 15.7% reported they suffered from high blood pressure and 45% suffered from neck and shoulder pain (NSP). Neck and shoulder pain and low back pain have recently been identified as problems in many countries. The use of new technology has led to high rates of computer, mobile phone and other electronic products. These factors lead to lack of exercise and skeletal – muscle dysfunction (Zhi *et al*, 2013). The assessment of NSP and LBP were carried out using the following questions under the section on medical history and work influences trends in the questionnaire: *“For the past three months, have you suffered from chronic low back pain after a long day’s work”*. The options provided in the answers were: *“occasionally (in a period of 1 to 3 times a month)”*; *“often (in a period of 1 to 3 times a week)”*; *“always (more than 3 times a month)”*. The given answers with often and always indicated presence of NSP and LBP. This was not without the consideration of the pre-existing musculoskeletal conditions. The

results revealed that 5.4% of the respondents indicated they suffered from diabetes. None of the respondents indicated that they suffered from any form of cancer.



Figure 10: Respondents suffering from ailments related to sedentary lifestyle

From the results, it was observed that 84.3% had indicated no for high blood pressure, 94.1% no to diabetes and 100% no to any form of cancer. This was in tandem with the findings of Stuart Ali and Franscesc Xavier Gomez (2017) who stated that the actual burden of the disease (NCDs) is poorly understood and people don't know that they suffer from the condition and therefore don't seek treatment as shown in the figure below;

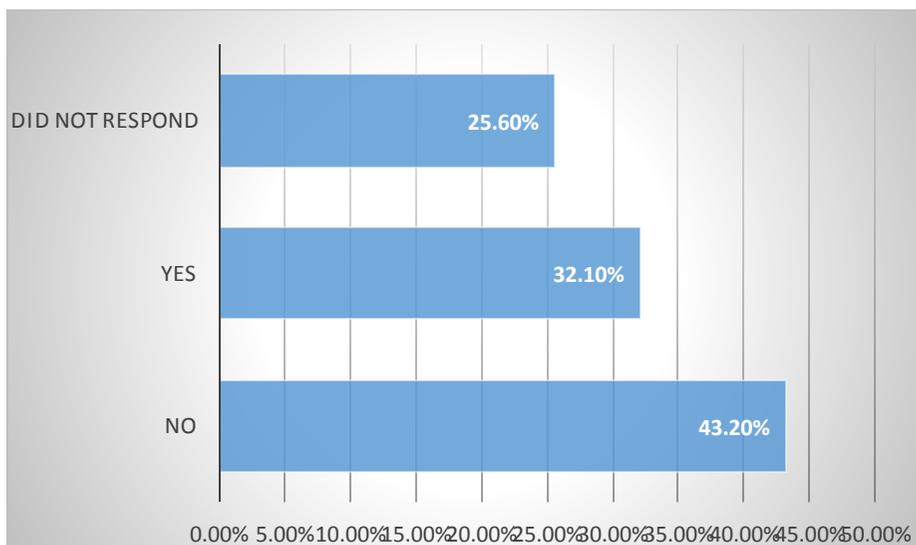


Figure 11. Respondents with medical condition and had not sought for medical attention.

A total of 43.2% did not seek medical attention despite having a medical condition and 25.6% did not respond. The study observed that most respondent did not do frequent medical check-up even when in pain. This was indicative of lack of awareness on the importance of having frequent medical check-ups. On gender basis, the respondents who suffered fatigue and muscle soreness after a long day's work and had not sought for medical attention were 31.5% male and 68.5 % female. The cross tabulation of cases of high blood pressure against whether the affected had sought for medical attention revealed that 70% male and 30% female had not, while for those who suffered from stiff neck and shoulder pain the result revealed 76.4% female and 23.5% male had not sought for medical attention.

4.0 Conclusions

The study concluded that use of motorised transport, screen time, delegation of house chores to house helps and occupational sedentary played a role in the prevalence of sedentary lifestyle among KALRO employees in the selected institutes. Three out of four of these factors were outside the workplace setting and increased with earnings, social economic status and age. The workers were at risk of developing sedentary lifestyle health conditions such as fatigue and muscle soreness, low back pain, certain forms of cancers, high blood pressure, stiff neck and shoulder pain, and central obesity. These findings provide a basis for management in KALRO to encourage physical activity by intervening at individual, environmental, and policy level through education and counselling sessions.

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