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Title: An investigation of leisure-time physical activity among public sector employees in the Ministry of Health in downtown Port of Spain

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An investigation of leisure-time physical activity among public sector employees in the Ministry of Health in downtown
Port of Spain

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ABSTRACT

Background – Physical inactivity is recognized as a risk factor for many chronic non-communicable diseases. According to the World Health Organization, World Health Report (2002), at least 60% of the world’s population does not meet the daily recommendation of physical activity. In Trinidad and Tobago, not much attention is paid to leisure-time physical activity (LTPA), there is no research literature on the leisure-time physical activity levels of the country.

Purpose – The purpose of this study was to investigate leisure time physical activity (LTPA) among public sector employees in the Ministry of Health in downtown Port of Spain between the ages of 25 to 55 years.

Methodology – The research data was collected through the distribution of a self-administered questionnaire that was comprised of 15 questions separated into sections; demographics, activity at work, travel to and from places, leisure time activity and sedentary behavior. The data were analyzed using SPSS 21.0. Descriptive statistics, analysis of variance (ANOVA)

Results – Analysis of variance (ANOVA) was used to test for differences between means for gender, age group, job description, and general income range. The means for age group, job description and general income range were not significantly different. However, a significant difference in means was noted in relation to gender ($p = 0.019$), males had a higher leisure time physical activity score than females.

Conclusion – Based on the results of the study, it can be said that less than half (44.4%) the sample population participated in LTPA “sometimes” during a typical 7-day week, however, a great deal of time is still being spent by members of the population being sedentary and that needs to be addressed. The male employees in the population had higher LTPA scores, and therefore participated in more LTPA than their female colleagues in the Ministry of Health. Focus should therefore be placed on increasing participation in LTPA particularly among the female population.

CHAPTER I

INTRODUCTION

Statement of Problem

Physical inactivity is perceived to be a serious public health concern, it has been declared as a risk factor for the development of several chronic, such as type 2 diabetes, cardiovascular disease and certain cancers (Sigal, Kenny, Wasserman, Castaneda-Sceppa, & White, 2006; Hu *et al.*, 1999; Reddigan, Ardern, Riddell, & Kuk, 2011; Jamrozik, Taylor, & Dobson, 2008; Shephard, 1990). Tessier *et al.*, declared that increasing physical activity has a positive association with reducing the risk of mortality and chronic diseases such as diabetes, cardiovascular and certain cancers (Tessier, Vuillemin, Bertrais & Briancon, 2007). According to the World Health Organization, World Health Report (2002), physical inactivity is estimated to contribute to 1.9 million deaths per year globally. The report stated that at least 60% of the world's population was not meeting the daily physical activity requirement of at least 30 minutes of moderate intensity physical activity. The epidemics of sedentary lifestyle, obesity and metabolic syndrome have also made physical activity of great importance in the maintenance of good health; the alleviation of these epidemics is of great public health concern due to the alarming number of people who suffer from them worldwide (Brouwer, Visseren, & Van der Graaf, 2007). Trinidad and Tobago is ranked 7th among the top 10 heaviest nations in the world when considering the number of adults per tonne biomass and energy required to maintain overweight and obesity of mecca's such as the United States and United Arab Emirates (Walpole, Prieto-Merino, Edwards, Cleland, Stevens, & Roberts, 2012). Based on data collected by the Central Statistical Office of Trinidad and Tobago (1960-2005), the leading cause of death, in Trinidad and Tobago is cardiovascular disease followed by diabetes mellitus, these conditions arise due to the poor nutritional habits and lack of physical activity generally noted throughout the population. Miller *et al* (2005), deduced that the low physical fitness level of the population in Trinidad was a predictor of death from all causes, particularly ischemic heart disease (Miller, Cooper, & Beckles, 2005). It is therefore, crucial to investigate how much physical activity the population is procuring in order to establish how much work needs to be undertaken to reduce the number of deaths related to lifestyle diseases.

In Trinidad and Tobago, not much attention is paid to the varying aspects of leisure-time physical activity (LTPA), in fact there is no research on the leisure-time physical activity levels in the country. Focus has generally been placed on exercise negating the fact that one may be physically active when commuting to and from their place of

employment, performing household activities such as cleaning and sweeping, among other activities, or other general tasks performed at one's job that requires any form of exertion or energy expenditure, may be considered LTPA (Lin, Huang, Lu, Wu, Chang, & Yang, 2011). There is also documentation on a study concluded in the southern part of Trinidad, namely, Princess Town on the exercise habits in South Trinidad, it was established that the vast majority of participants did not exercise regularly or if they did, not at the recommended amount (Babwah & Nunes, 2010). Babwah & Nunes (2010), suggested that the population needed to be encouraged and motivated to become more physically active and that said encouragement and motivation should come from healthcare providers because their advice and opinions were widely accepted as being of great importance. It was also stated that participants of the study stated that time was an important predictive factor when considering daily exercise habits or lack thereof because many respondents complained that they did not have sufficient time to exercise and as such time management needs to be a focus when addressing the issue (Babwah & Nunes, 2010).

Due to the lack of research on physical activity levels in Trinidad and Tobago, not much can be said with respect to the number or percentage of persons who participate in physical activity or in the case of this study leisure-time physical activity. In this context, this study investigates the leisure time physical activity level of public sector employees in the Ministry of Health, in Port of Spain between the ages 25 to 55 years.

Purpose

The purpose of this study was to investigate leisure time physical activity (LTPA) among public sector employees in the Ministry of Health in downtown Port of Spain between the ages of 25 to 55 years.

Objectives

The objectives of this study were as follows:

1. To compare the perceived level of physical activity reported between males and females.
2. To establish the variation in leisure-time physical activity levels between identified age groups
3. To determine if the participants job description has a relationship with leisure-time physical activity levels.
4. To identify if there is a relationship between socio-economic status and leisure-time physical activity levels

Hypotheses

It was hypothesized that:

1. The male population in the Ministry of Health will have a greater level of leisure-time physical activity than the female population.
2. The variation in leisure-time physical activity levels will be greater in the younger adults than the older adults.
3. Participants whose job description includes manual labor will have a lower level of leisure-time physical activity.
4. Individuals who are of a higher socio-economic status will have a lower level of leisure-time physical activity when compared to those of lower socio-economic status.

Significance of Study

LTPA has been found to have many positive lifestyle impacts. Increased levels of LTPA have been linked to reductions in the risk of premature mortality and increased life expectancy (Mooreet *al.*, 2012). Most of the literature on LTPA has been focused on individuals over the age of 40 years and particularly middle aged adults with very few focused on individuals who are younger than 40 or with an age range, such as the one being undertaken in this study. Additionally, there is no current information about the LTPA levels among any population in Trinidad and Tobago. Therefore, in an attempt to increase the amount of LTPA undertaken by public sector employees and citizens at large, and in turn possibly lengthening the life expectancy of our population in the process, the investigation of LTPA among public servants in the Ministry of Health is pertinent. The Ministry of Health was chosen as the population for this pilot study because it is assumed that these employees should have a greater grasp of healthy living due to the nature of the organization they are working in, and in a society riddled with individuals who are suffering from chronic non-communicable diseases, it is of great importance to explore every avenue possible to extend the life expectancy of our population.

CHAPTER II

LITERATURE REVIEW

Introduction

Physical activity is defined as “any bodily movement produced by skeletal muscles, resulting in increased energy expenditure” (Caspersen, Powell, & Christenson, 1985). Individuals who participate in regular physical activity tend to be at a decreased risk for developing cardiovascular disease, hypertension, diabetes, obesity, certain cancers and overall morbidity and mortality (Lin, Huang, Lu, Wu, Chang, & Yang, 2011; Warburton, Nicol, & Bredin, 2006; Haapanen, Miilunpalo, Vuori, Oja, & Pasanen, 1996). It can therefore be said, that physical activity is an important factor in conducting a healthy lifestyle. There are two forms of physical activity, leisure time physical activity (LTPA) and non-leisure time physical activity (NLTPA). LTPA can be defined as the physical activity performed during exercise, recreation or any time other than those associated with one’s regular occupation, housework or transportation whereas NLTPA is defined as the physical activity that is associated with one’s occupation, housework and transportation (Lin *et al.*, 2011; Chow, 2006).

The World Health Organization (WHO) ranked physical inactivity as the fourth most important risk factor of mortality in the world (Rodjer *et al.*, 2012). It has been recommended that individuals complete at least 150 minutes of moderate intensity physical activity per week (Rodjer *et al.*, 2012) and at least three 20-minute sessions of vigorous intensity physical activity per week (Salmon, Owen, Bauman, Schmitz, & Booth, 2000). Unfortunately, alarming rates of sedentary behavior has been observed in both developed and developing countries. Many countries are, however, currently implementing programs and healthy lifestyle initiatives geared towards increasing the physical activity level of their population and overall well being (Azevedo, Araujo, Reichert, Siqueira, Da Silva, & Hallal, 2007). For example, 30% of the adult Jamaican population did not exercise (Ichinohe *et al.*, 2005) and 75% of Curacao’s population did not exercise regularly (Grol, Halabi, Gerstenbluth, Alberts, & O’Niel, 1997). There is currently only one study that focuses on the exercise habit of the population in Trinidad and Tobago, which was done in South Trinidad, namely the Princess Town area, in this study it was established that a high proportion of individuals in southern Trinidad did not exercise regularly or adequately and that efforts were needed to encourage the population to participate in physical activity (Babwah & Nunes, 2010). However, there is currently no literature to be found in relation to LTPA in Trinidad and Tobago.

Studies have show that participation in LTPA was related to age, education, marital status, type of job and smoking (Chen, Huang, Lu, Wu, Chang, & Yang, 2011; Roohafza, Sadeghi, Shirani, Bahonar, Mackie, & Sarafzadegan, 2009; Salmon , Owen, Bauman, Schmitz, & Booth, 2000;).

Leisure Time Physical Activity and Age

Age is a non-modifiable risk factor for chronic disease and due to this fact, physical inactivity in the elderly is of particular concern. LTPA has mainly been investigated in the elderly because they are less likely to participate in LTPA, but are likely to benefit a great deal from it if they did (Perrin, Gauchard, Perrot, & Jeandel, 1999). Chen *et al.*, discovered in their study that there was a positive association between age and LTPA (Chen *et al.*, 2011). In comparison, in a study embarked upon in Australia, the authors established a connection between physical inactivity and age. Researchers determined that the inactive tend to be older, less well educated and have lower incomes (Owen & Bauman, 1992).

In another study, the prevalence of regular physical activity was 37% among older men and 24% among older women in a population of 2783 older male and 5018 older female respondents in the United States of America. It was found that participation in regular physical activity was correlated to the perception of excellent to good health, accurate exercise knowledge, no activity limitations and not perceiving "a lot" of stress during the previous 2 weeks (Yusuf *et al.*, 1996).

Similarly, in a follow-up study done on young Danish adults, where an investigation was done into the relationship between social influences and low leisure time physical activity (Lindstrom, Hanson, & Ostergren, 2001), it was said that many youths and adults maintain a sedentary lifestyle and it is due to that fact, that the impact of social influences must be determined (Osler, Clausen, Ibsen, & Jensen, 2001). In this respect, Karamarow, (2012), also found a similar result in a study undertaken by the Centers for Disease Control and Prevention. The results of the study carried out in Southern Trinidad by Babwah and Nunes, (2010), depicted similar results. The researchers determined that younger individuals were more likely to exercise than older persons, 71.1% of the study population were the younger adults who participated in physical activity, while a meager 46.8% of older persons participated in physical activity (Babwah & Nunes, 2010).

Several studies have focused on the older population and their lack of leisure time physical activity and the benefits of them participating in LTPA (Lin *et al.*, 2011; Byberg *et al.*, 2008; Manini, *et al.*, 2006; Brach, Simonsick, Kritchevsky, Yaffe, & Newman, 2004). Various studies have focused on increasing life expectancy in the older population and reducing the risk of cardiovascular disease (Hu, Chien, Hsieh, Chen, Tsai, & Su, 2013; Moore *et al.*, 2012; Shiroma & Lee, 2010; Byberg *et al.*, 2008; Jonker, De Laet, Franco, Peeters, Mackenbach, & Nusselder, 2006).

In a study done on 138 Canadian children, it was determined that participation in LTPA decreased with age, as the children became chronologically older, their physical activity levels decreased (Thompson, Baxter-Jones, Mirwald, & Bailey, 2003). The same concept can be used to determine the aging population is the prime target of the vast majority of physical activity plights.

Contrary to those studies, a study done on 4437 Finnish adults determined that there was an association between age and education with different type of LTPA. It was concluded by the authors that, all age groups have similar levels of overall and daily levels of LTPA, but the levels differ across educational groups (Borodulin, Laatikainen, Lahti-Koski, Jousilahti, & Lakka, 2008) and by default, socioeconomic status (Cerin & Leslie, 2008).

Leisure Time Physical Activity and Socioeconomic Status

Socioeconomic status has been said to have a great impact on LTPA participation and levels. Research study results may also tend to vary based on the other factors being examined. A vast amount of the research, however, has concluded that individuals who are considered as having a high socioeconomic status tend to participate more in leisure-time physical activity and individuals with low socioeconomic status tend to be the sedentary group (Annear, Cushman, & Gidlow, 2009; Borodulin, Laatikainen, Lahti-Koski, Jousilahti, & Lakka, 2008; Brownson, Boehmer, & Luke, 2005). This may also be related to the education level of the participants (Borodulin *et al.*, 2008). There are similar implications in the findings of the Brazilian study done by Dias-da-Costa *et al.*, (2005) where it was observed that there were arresting differences in socioeconomic status when LTPA is considered. The study demonstrated a lack of leisure-time physical activity in the lowest socioeconomic groups, similar to several studies in developed countries (Legh-Jones & Moore, 2012; Dias-da-Costa *et al.*, 2005). This was consistent with Dias-da-Costa *et al.*, (2005) hypothesis that higher-income individuals are more likely to follow preventive programs and health-promoting behavior (Dias-da-Costa *et al.*, 2005), the authors stated that these findings may have been due to either a greater motivation among the higher-income individuals

or more access to resources in order to participate. Likewise, another study concluded that individuals who fell into lower income brackets had a tendency to have reduced levels of leisure-time physical activity participation; withal if participation in work-related activity was considered, lower income individuals may have a higher level of this type of physical activity base on the fact that lower income individuals tend to participate in more vigorous intensity work-related activities (Hallal, Victora, Wells, & Lima, 2003). Based on the fact that, majority of the studies were carried out in high-income countries and not low and middle-income countries, there may be some disparities when compared to data obtained in the low and middle-income countries (Azevedo, Araujo, Reichert, Siqueira, Da Silva, & Hallal, 2007).

Washburn *et al.*, (1992) investigated whether or not there was a difference in LTPA between white and black ethnicities, in keeping with previous studies discussed the researchers deduced that leisure time energy expenditure continued with the general trend seen, it decreased with increasing age and body mass index and tended to increase with increasing levels of education and income among all race/gender groups (Washburn, Kline, Lackland, & Wheeler, 1992).

A study which investigated leisure time, occupational and household physical activity among professional, skilled, and less-skilled workers and homemakers stated that adults who fall into lower status occupations tend to be at a higher risk of premature cardiovascular disease. The authors state that lower rates of leisure-time physical activity have been associated consistently with lower income and educational levels (Salmon *et al.*, 2000).

Leisure Time Physical Activity and Gender

Several studies have found that men are more active in their leisure time than women. In the study done by Dias-da-Costa *et al.* (2005), the results were the same. Alternatively, when the researchers analyzed total physical activity, there were no gender differences (Gomes *et al.*, 2011; Babwah & Nunes, 2010; Byberg *et al.*, 2008; Azevedo *et al.*, 2007; Dias-da-Costa *et al.*, 2005; Monteiro *et al.*, 2003; Gomes, Siqueira, & Sichieri, 2001; Martinez-Gonzalez *et al.*, 2001; Burton & Turrell, 2000). Some studies have not noted any significant difference in LTPA levels between males and females. In a study done investigating the effect of moderate to vigorous intensity LTPA and mortality, it was determined that there was no vast difference between the sexes; they had a fairly similar association when it came to life expectancy and LTPA. Both sexes gained more years of life by participating in LTPA (Moore *et al.*, 2012). Hallal *et al.*, (2003), also stated that no difference was noted between the genders when examining leisure time physical activity (Hallal, Victora,

Wells, & Lima, 2003).

It should be noted that a study conducted with African American young adults, investigated the relationship between LTPA and aerobic fitness. By the same token as other studies previously discussed the percentage of men who were active was greater than that of women. Researchers also noted differences in the amount of aerobic activity undertaken by both sexes (Ainsworth, Berry, Schnyder, & Vickers, 1992). One study said that education and childhood smoking were associated with low leisure time physical activity in women (Osler, Clausen, Ibsen, & Jensen, 2001). Washburn *et al.*, (1992) also came to conclusions in relation to gender, the study done which was performed in South Carolina, used a logistic regression analysis to deduced how significant ethnicity was in relation to leisure time physical activity participation, after making adjustments for confounding factors such as gender, age, income, and body mass index, it was concluded that ethnicity made a statistically significant contribution to the relationship, particularly in women (Washburn, Kline, Lackland, & Wheeler, 1992).

A study investigating gender differences in LTPA concluded that due to the differing levels of physical activity in men and women, and the other variables associated with activity levels, which are also inconsistent across the genders, any interventions which are to be undertaken to promote increased physical activity and LTPA should first evaluate and take into account these differences (Azevedo, Araujo, Reichert, Siqueira, Da Silva, & Hallal, 2007).

In conclusion, it appears that many factors may affect individual's participation in LTPA and it may vary between age groups, socioeconomic statuses and gender. There has been a noticeable trend of the elderly/older adults not acquiring sufficient physical activity. It has also been deduced that as chronological age increases the amount of physical activity one participates in decreases, however, this may not always be so, studies have shown conflicting results. Some studies have shown that younger adults also tend to be more active than older adults, but once again, it is dependent on the other variables being examined in the study (Lin *et al.*, 2011; Byberg *et al.*, 2008; Manini, *et al.*, 2006; Brach *et al.*, 2004; Thompson *et al.*, 2003; Washburn *et al.*, 1992). Several studies have also concluded that participants who are of a higher socioeconomic class or who received higher incomes were more physically active than those of lower socioeconomic classes or low and middle incomes (Annear, Cushman, & Gidlow, 2009; Borodulin *et al.*, 2008; Brownson, Boehmer, & Luke, 2005). This may also be associated with the geographical area, results for developed and developing countries may be different.

In relation to gender, the majority of studies have noted a difference between males and females. A large quantity

of studies has deduced that male respondents tend to be more physically active than their female counterparts (Gomes *et al.*, 2011; Babwah & Nunes, 2010; Byberg *et al.*, 2008; Azevedo *et al.*, 2007; Dias-da-Costa *et al.*, 2005; Monteiro *et al.*, 2003; Gomes, Siqueira, & Sichieri, 2001; Martinez-Gonzalez *et al.*, 2001; Burton & Turrell, 2000). Though, this is based on the other variables being examined by the researchers, some studies have not come across any significant differences between the genders (Moore, *et al.*, 2012; Hallal *et al.*, 2003).

CHAPTER III

METHODOLOGY

Research Design

A cross-sectional study design was used with a purposive-convenience sampling method, which is a non-probability sampling method. This sampling method was utilized because the study was done on a non-representative subset of a larger population, selection was unguided but not completely random and participants consisted mainly of volunteers (University of California). The target population was public sector employees between the ages of 25 to 55 years old within the Ministry of Health in the downtown Port of Spain area. The sample size was estimated using the formula ($n = \frac{1.96^2 s^2}{d^2}$). The formula was based on the predictive prevalence of participants achieving a leisure score of 119. This is in relation to the statement of “how many times per week; on average one spends doing strenuous, moderate or mild exercise for 15 minutes during one’s free time”. The sample size calculated with a 5% level of significance was 96 persons.

Participants

Bamberger states that data collection is the area in which the procedures and benefits of integrated approaches are best understood (Bamberger, 2000). In that context, the researcher utilized the following data collection methodology i.e. self-administered questionnaires. As such, questionnaire(s) were administered to the employees of the Ministry of Health, Port of Spain Office in order to elicit information about LTPA.

Over a 2-week period, the researcher administered 150 questionnaires in an attempt to collect more than the estimated sample size. Ministry of Health offices were contacted and informed of the research being conducted prior to the data collection process, permission to carry out the research was granted. The purpose of the research was thoroughly explained to all participants and the fact that it was completely anonymous and confidential was highlighted. The research data were collected through the distribution of a self-administered questionnaire to be completed by all participants. A pilot study was undertaken prior to distributing finalized questionnaires, in order to ensure that the questionnaire was applicable and relevant to the population. A total of 150 questionnaires were distributed to Ministry of Health employees, only 108 usable questionnaires were collected.

The study had a response rate of 72%. The questionnaires were given to participants along with the explanation of the research purpose and advised that any questions they may have had could be directed to the researcher, they were asked to take five (5) minutes from their schedule in order to complete the questionnaire. The participants who were unable to complete their questionnaire immediately were directed to complete it at their leisure and to return it by a date, which was agreed upon, between the researcher and the participant. Participants were asked prior to completing the study questionnaire whether or not they had any diseases or conditions that may have affected their participation in regular physical activity, it was also ensured that they were within the specified age range in order to be included in the study. If it was established that the participant did in fact have a disease or condition that may have affected the results of the study they were excluded, pregnant individuals were also excluded from the study due to the fact that their ability to perform physical activity and their required amount of activity would have been different to that of non-pregnant individual.

Instrument

Questionnaires are often used to collect quantitative data, bearing in mind that the general aim of any research project is to gather valid, reliable and unbiased and discriminatory data from a representative sample of respondents. That notwithstanding, the information obtained is often subject to error and bias from a range of sources.

In this study the survey questionnaire was utilised as the principal data-gathering tool. As such, questions were pooled and selected from three (3) different questionnaires, the *Godin Leisure Time Physical Activity Questionnaire*, the *International Physical Activity Questionnaire* and the questionnaire used in a study done on the validity and repeatability of a simple index derived from the short physical activity questionnaire used in the European Prospective Investigation into Cancer and Nutrition (EPIC) study (Wareham, *et al.*, 2002). Permission was granted from the relevant bodies for the use of the questionnaires.

The questionnaire was comprised of five (5) sections. The first section asked respondent simple demographic questions. The respondent was to tick the box that corresponded best to them. Questions on the respondent's age group, gender, ethnicity, their current employment status and general income range comprised this section. Age group, gender and general income range were the independent variables of the study. Based on the fact that Trinidad and Tobago is a society composed of individuals from varying racial backgrounds, ethnicities were separated as Afro-Trinidadian, Indo-Trinidadian, Mixed and Other. The mixed ethnic group was for individuals who can be considered to be of two or more ethnic groups (usually Afro-Trinidadian and Indo-Trinidadian or African and European descent) (Winer, 2009), while the other ethnic group was considered to be individuals of Caucasian, Asian or Hispanic ethnicities, among others.

The second section referred to the respondent's current occupation or job description, entitled 'Activity at Work'. In this section, the respondent was asked to select what type of job they would say they have, or what their job would be classified as and examples of each type of occupation was given. The options for this question were, sedentary occupation, standing occupation, physical work and heavy manual work. Based on the response given respondents were asked to either answer questions 7 and 8 (if they selected heavy manual work) or proceed to questions 9 and 10, if any of the other answers were selected. Questions 7 to 10 were based on whether or not respondents did moderate and vigorous intensity physical activity as part of their work. It was important to have an idea of how much physical activity respondent's jobs involved because it may have affected their willingness to participate in leisure-time physical activity.

The third section of the questionnaire dealt with what physical activity respondents did in their commute to and from places such as work, the shopping mall, their place of worship, to the market, et cetera. This excluded the physical activity they had already mentioned at work. Respondents were asked to state whether or not they walked or cycled for at least 10 minutes continuously while going from one place to another, by selecting either 'yes' or 'no'. Immediately following that question, respondents were asked to kindly state how many days in a typical week they did so, if at all.

In the fourth section, participants were asked to select the most appropriate answer from 'often', 'sometimes' and 'never/rarely', in response to the question of "During a typical 7-day period (week), how often they engaged in any regular physical activity long enough to work up a sweat (heart beats rapidly)?" Participants were then asked to state how many times in a typical 7-day week, they participated in any of the listed types of exercise for more than 15 minutes during their free time. Three types of exercise were listed, they were, strenuous exercise, moderate exercise and mild exercise, examples of what was meant by each type of exercise were clearly stated below, in addition to an explanation as to what was meant by each type. Strenuous exercise was considered to be any form of physical activity that caused the participants heart to beat rapidly with examples such as, running, football, vigorous cycling among others, moderate exercise was considered to be any form of physical activity that required physical exertion but was not exhausting with examples such as, easy swimming, folk dancing, fast walking. Mild exercises are activities requiring minimal effort, such as yoga, archery, easy walking. The highest score that can be attained by an individual in this section of the study is 119; the individual would have had to perform each of the intensities of exercise everyday of the week. Scores can be classified 24 units and more is equivalent to 14 kcal/kg/week or more which was considered to be active and of substantial health benefit, 14 to 23 units is equivalent to between 7 and 13.9 kcal/kg/week which was considered to be

moderately active and only having some benefit, less than 14 units is equal to less than 7 kcal/kg/week which was considered to be insufficiently active and of less substantial or low benefit (Godin, 2011).

The final section was to obtain an estimate of how much time participants spent being sedentary in their opinion. They were asked to state how much time (in hours) they usually spent sitting or reclining on a typical day. Prior to the question, it was stated that the question was about time spent sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in a car or bus, time spent reading, playing cards or watching television. Participants were expected to write in an estimated figure for the number of hours spent displaying sedentary behaviour.

Analysis

Data were undertaken using IBM SPSS Statistics 21.0 software package for Mac (SPSS, Inc, 2012, Chicago, IL, USA). Descriptive statistics were used to calculate frequencies, percentages and means of the data collected. Frequencies were generated for all demographic data, which included age group, gender, ethnicity, general income range, employment status and job description. Frequencies were also generated for the number of participants who walked or cycled for at least 10 minutes in a typical day and for the number of days for the week participants did as such. In addition to that, the frequency for the question on how often participants engaged in regular activity long enough to work up a sweat was also generated.

Leisure time physical activity scores were computed using Microsoft Excel 2011 for Macintosh computers. The responses given by participants were multiplied by factors based on the type of exercise; strenuous exercise was multiplied by nine (9), moderate exercise was multiplied by five (5) and mild exercise was multiplied by three (3). The sum of all the values was then calculated and referred to as the participant's leisure time activity score. The frequency of LTPA scores was also generated. Mean LTPA scores were generated gender, age group, job description and general income range.

Analysis of variance (ANOVA) was used to test for differences between means for gender, age group, job description, and general income range (independent variables) in relation to LTPA scores, which was the dependent variable. The level of statistical significance for all tests was $p < 0.05$.

CHAPTER IV

RESULTS

Demographics

Table 1 presents the demographic characteristics of the sample population. The sample comprised of 108 public sector employees of the Ministry of Health offices located in downtown Port of Spain. The total population was 300 employees. Females were the majority of participants in the study, 69, whereas only 39 participants were male. This accounted for 63.9% and 36.1% respectively of all participants. Participants were mainly of Afro-Trinidadian descent, which represented 42.6% (n=46), followed by participants of mixed decent, which accounted for 29.6% (n=32) of participants. Indo-Trinidadian descent represented 23.1% (n=25) of the participants, with the minority of participants being in the Other group, which represented, participants of Asian, Caucasian and other ethnicities, this only accounted for 4.6% (n=5) of the participants. Most of respondents were in the 25-35 age group, 45.4% (n=49), the minority of the respondents were between the ages of 36 – 45, 24.1% (n=26).

Upon investigation of the participant's job types and employment status, the bulk of participants had sedentary occupations and was permanently employed. 63.9% (n=69) of participants had sedentary occupations while 16.7% (n=18), 14.8% (n=16) and 4.6% (n=5) had standing occupations, occupations that required physical work and occupations that required heavy manual work, respectively. Most of the participants were permanently employed, 42.6% (n=46).

With regard to socioeconomic status, monthly income range was used as the indicator. The majority of respondents, 82.4% (n=89) received less than \$10,000 per month as their salary, or were of low socioeconomic status. Only 14.8% (n=16) received between \$10,000 to \$20,000 per month as their salaries and a mere 2.8% (n=3) received more than \$20,000 per month, or were of high socioeconomic status.

Table 1: Demographic Data for Ministry of Health sample population.

Variable	Classification	Frequency (n = 108)	Percentage (%)
Gender:	Female	69	63.9
	Male	39	36.1
Ethnicity:	Afro-Trinidadian	46	42.6
	Mixed	32	29.6
	Indo-Trinidadian	25	23.1
	Other	5	4.6
Age Range:	25 - 35	49	45.4
	36 - 45	26	24.1
	46 - 55	33	30.6
Job Description:	Sedentary Occupation	69	63.9
	Standing Occupation	18	16.7
	Physical Work	16	14.8
	Heavy Manual Work	5	4.6
Employment Status:	Permanent Employee	46	42.6
	Temporary Employee	31	28.7
	Contract Employee	31	28.7
Income Range:	Less than \$10,000	89	82.4
	\$10,000 - \$20,000	16	14.8
	More than \$20,000	3	2.8

Travel to and from places

When considering travel to and from places, participants were asked to state “yes” or “no” to whether the walk or bicycle for at least 10 minutes continuously to get to and from places, 75.7% (n=81) of the participants said yes, while the other 24.3% (n=26) participants did not walk or cycle for 10 minutes continuously. Of the 75.7% (n=81) participants that selected yes, they were asked to further elaborate and give an estimate as to the number of days, in a typical week that they perform this action, the majority of participants, 34.6% (n=28), stated that they walked or cycled for 5 days in a typical 7-day week, 25.9% (n=21) of the participants said that they walked or cycled everyday for the week. Participants who claimed they participated in these activities 6 days for the week, 4 days for the week and 2 days for the week each was 7.4% (n=6). 13.6% (n=11) participants said that they walked or cycled for 10 minutes continuously on 3 days for the week and only 3.7% (n=3) participants stated that they only walk or cycle 1 day for the week, as summarized in Figure 1 and Table 2.

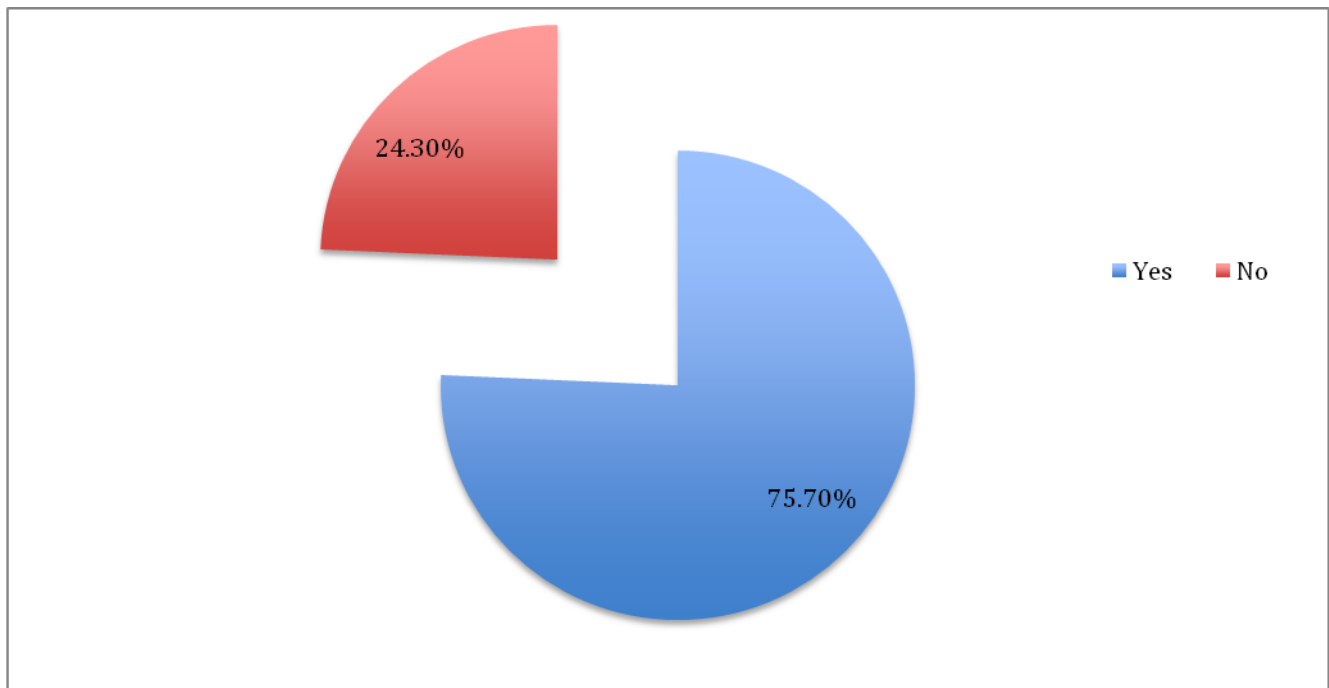


Figure 1: Pie chart showing percentage of persons who answered "yes" or "no" to walking or using a bicycle for at least 10 minutes continuously to get to and from places

Table 2: Number of days participants walk/cycle for 10 minutes continuously as a transport to and from places.

Number of Days spent walking/ cycling for 10minutes continuously	Frequency (n=81)	Percentage (%)
1	3	3.7
2	6	7.4
3	11	13.6
4	6	7.4
5	28	34.6
6	6	7.4
7	21	25.9

Leisure Time Physical Activity

Figure 2 depicts the percentage of respondents that participated in regular physical activity during their leisure time. Respondents were asked how during a 7-day period (week) they engaged in any regular activity, in their leisure time, long enough to work up a sweat or make their heart beat rapidly, the majority of respondents 44.4%(n=48) said they only did as such “sometimes”, whereas 33.3%(n=36) said they did so “often” and the other 22.2%(n=24) rarely did it or not at all.

Table 3 demonstrates the means and standard deviation for demographic variables and LTPA scores. Weekly activity was then divided into sections (strenuous exercise, moderate exercise, mild exercise) and respondents were asked to state how many days for the week they performed each type of exercise, if at all, for more than 15 minutes during their free time. A leisure-time physical activity score was calculated for respondents based on their responses in this section. Scores ranged from 0 (n=4) to 111 (n=1), a score of 15 (n=8) was the most frequent. The highest score that could have been attained was, 119. Most participants received very low scores when compared to the highest score. The mean score for the entire sample was 34.89 ± 23.81 . Male respondents had a higher mean LTPA score compared to female respondents, 42.03 ± 24.49 and 30.72 ± 22.56 , respectively.

When the mean LTPA scores for the specified age groups was considered, the 25-35 age group had the highest mean 35.77 ± 26.92 , following closely behind was the 46-55 age group, who had a mean LTPA score of 35.16 ± 20.94 and the age group with the smallest mean LTPA score was the 36-45 age group with a score of 32.92 ± 21.60 .

Participants who had occupations that required physical work had the highest mean LTPA score, 46.42 ± 30.97 when considering job description and LTPA scores, immediately following them were the participants who's occupation required heavy manual work with a mean LTPA score of 44.20 ± 15.26 . Participants who performed sedentary and standing occupations had the least number of participants.

Mean LTPA scores were also determined for the various general income ranges as a means of determining LTPA participation in relation to socioeconomic status. Participants who had a general income of \$10,000 to \$20,000 per month had the highest mean score of 39.38 ± 23.16 . Participants who fell into the other two general income ranges, less than \$10,000 and more than \$20,000, had mean LTPA scores of 34.40 ± 24.33 and 24.67 ± 0.58 , respectively.

Analysis of variance (ANOVA) was used to test for differences between means for gender, age group, job description, and general income range. Table 4 conveys the analysis of total LTPA scores with selected independent variables and the accompanying F and p values. The means for age group, job description and general income range were not significantly different. However, a significant difference in means was noted in relation to gender ($p = 0.019$), males had a higher leisure time physical activity score than females.

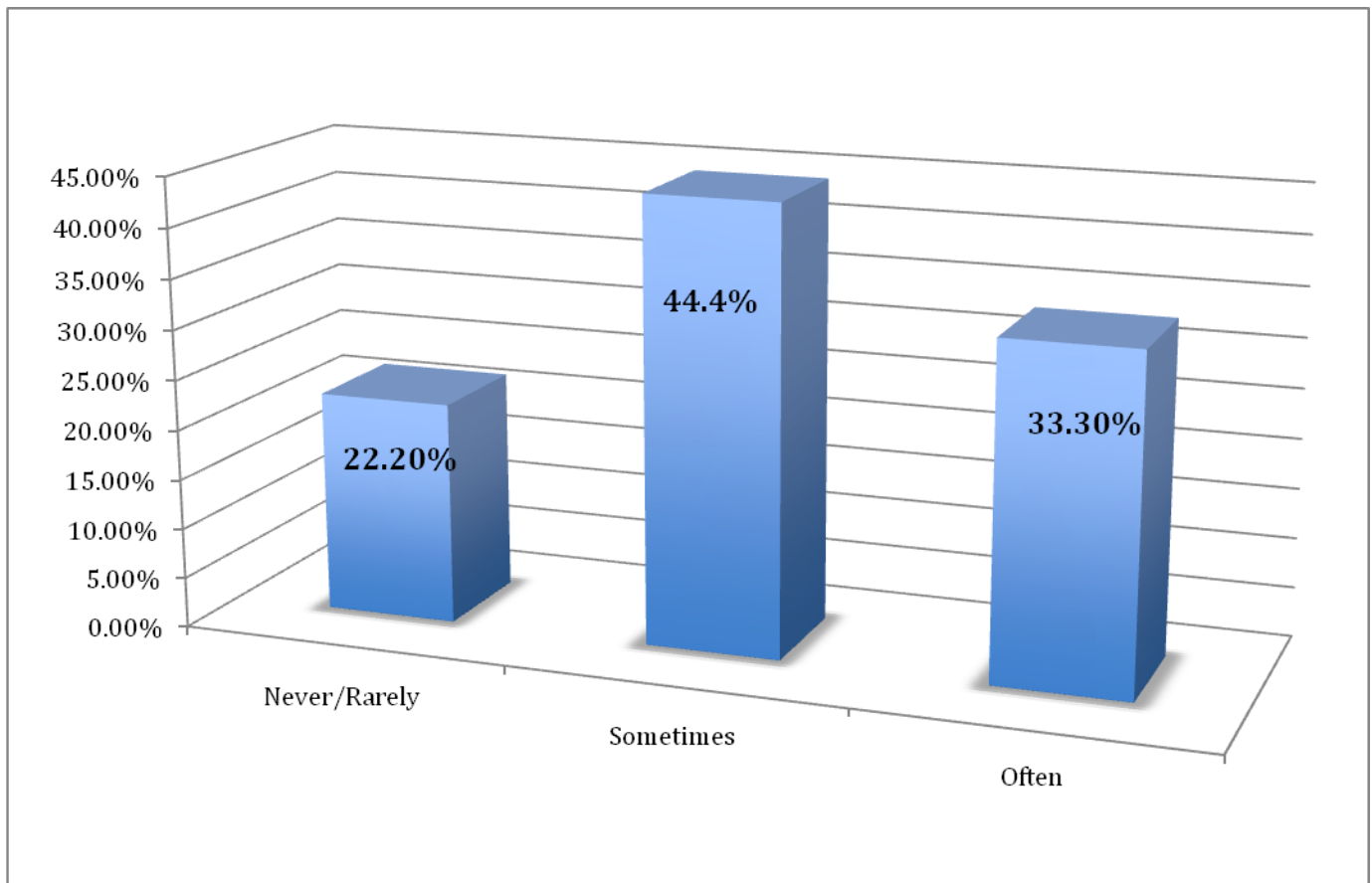


Figure 2: Column Chart depicting how often participants engaged in regular activity in their leisure time

Table 3: Means and Standard Deviation for Demographic Variables and Leisure Time Physical Activity (LTPA) Scores.

Variable	Category	Group	Means $\pm$ Standard Deviation
LTPA Score	Sample	Total	34.89 $\pm$ 23.81
	Gender	Male	42.03 $\pm$ 24.49
		Female	30.72 $\pm$ 22.56
	Age Group	25-35	35.77 $\pm$ 26.92
		36-45	32.92 $\pm$ 21.60
		46-55	35.16 $\pm$ 20.94
	Job Description	Sedentary Occupation	33.10 $\pm$ 24.11
		Standing Occupation	31.39 $\pm$ 17.05
		Physical Work	46.42 $\pm$ 30.97
		Heavy Manual Work	44.20 $\pm$ 15.26
	General Income Range	< \$10,000 per month	34.40 $\pm$ 24.33
		\$10,000 - \$20,000 per month	39.38 $\pm$ 23.16
		>\$20,000per month	24.67 $\pm$ 0.58

Table 4: ANOVA Analysis of Total Leisure Time Physical Activity (LTPA) Scores with Selected Independent Variables and the Accompanying F and p Values

Dependent variable: LTPA Scores

Independent variables	F-value	p-value
Gender	5.651	0.019*
Age Group	0.117	0.889
Job Description	1.470	0.227
General Income Range	0.573	0.566

* Significant ($p < 0.05$)

CHAPTER V

DISCUSSION

The study investigated leisure-time physical activity among public sector employees in the Ministry of Health in downtown Port of Spain between the ages of 25 to 55 years.

The study was composed of 39 male and 69 female employees ($n = 108$). Most of the participants were of Afro-Trinidadian descent, 42.6% ($n=46$), in the “25-37” age group, 45.4% ($n=49$), permanently employed, 42.6% ($n=46$), had a sedentary occupation, 63.9% ($n=69$), and had a general income range of less than \$10,000 per month, 82.4% ($n=89$).

Factoring in participants physical activity outside of their occupation but not within their leisure time is important because if they are very active in those periods of times, it may affect the willingness to participate in LTPA. When the question of walking or cycling continuously for at least 10 minutes was posed to participants, the vast majority, 75.7% ($n=81$), stated that they did in fact do so. Surprisingly, participants engaged in this activity often, with the most frequent response being 5 days, 34.6% ($n=28$) and not far behind were the 25.9% ($n=21$) of participants who stated they did so all 7 days of the week. This accounts for participants’ non-leisure time physical activity (NLTPA), which is said to be an independent predictor of longevity among older individuals; there is an association between NLTPA and lower mortality risk in the elderly population. (Lin, Huang, Lu, Wu, Chang, & Yang, 2011)

Majority of participants, 44.4% ($n=48$), stated that they engage in regular activity long enough to work up a sweat “sometimes”. However, when asked to state exactly how often they do specific intensities of exercise their leisure time physical activity scores reflected that good levels of LTPA. The mean LTPA score was 34.89 ± 23.81 , according to (Godin, 2011) scores of 24 and above is equivalent to 14 kcal/kg/week or more which was considered to be active and of substantial health benefit. So overall the population had a good level of LTPA. When the LTPA scores were compared with age group, gender, job description and general income range. The highest means were seen in the male group, 42.03 ± 24.49 , the 25 to 35 age group, 35.77 ± 26.92 , the physical work occupation, 46.42 ± 30.97 , and the \$10,000 to \$20,000 general income group, 39.38 ± 23.16 .

Upon investigation using ANOVA, no significant differences were noted when the means for age group, job description and general income range was compared with the LTPA scores. However, gender was the only factor that significance was calculated ($p=0.019$).

This analysis implies that young male individuals tend to be the most physically active during their leisure-time physical activity, this may be due to increased physical ability when compared to their older counterparts. Younger individuals tend to be a lot more willing to participate in physical activity because they tend to have more energy than older individuals and less health related issues that may affect their physical performance, though not completely non-existent. The high proportion of participants who took part in regular physical activity during their leisure time may have been due to the fact that a large percentage of the participants had sedentary occupations and spent most of their time relaxing or reclining at work and as such felt more inclined to be physically active in their spare time because their jobs were not as physically taxing. Education level is also an important factor that was not factored into the study and may have given rise to even more information, which could have explained the level of participation among the population.

Babwah & Nunes (2010), found that there was a significant difference established between age groups, younger individuals were expected to have a higher level of physical activity than older persons. There are similar implications in the findings of a study undertaken by the Center for Disease Control and Prevention; researchers found that males within the 25-34 age group participated in LTPA far more than any other age group(Karamarow, 2012).Conversely, Borodulin *et al.*, (2008) concluded that, all age groups have similar levels of overall and daily levels of LTPA, but the levels differ across educational groups (Borodulin, Laatikainen, Lahti-Koski, Jousilahti, & Lakka, 2008) and by default, socioeconomic status (Cerin & Leslie, 2008).

Socioeconomic status is also expected to have a significant impact of LTPA levels; however, none was established in this study. This may have been due to limitations of the study. These finding may differ from other studies done, where it was established that individuals who are generally of higher a socioeconomic status have a greater tendency to be more inclined to engage in LTPA (Annear, Cushman, & Gidlow, 2009; Borodulin, Laatikainen, Lahti-Koski, Jousilahti, & Lakka, 2008; Brownson, Boehmer, & Luke, 2005). To the contrary, some studies have argued that this may be dependent on the country the study is done in, data for developed countries and developing countries may differ based on resources and level of education (Azevedo *et al.*, 2007;Dias-da-Costa *et al.*, 2005; Hallal *et al.*, 2003). It is typically expected that individuals of higher socioeconomic class, have a higher education level, but this may not be the case in the Ministry of Health, individuals may have been promoted based on seniority and years of service and as such this may present a problem. One study concluded that participation in leisure-time activities is reduced among lower-income individuals and suggested that if lower-income individuals participation in vigorous work-related activities was to

be considered, they may have higher level of work-related physical activity as compared to higher-income individuals (Hallal, Victora, Wells, & Lima, 2003), which seemed to be the case in the population studied.

The significance with respect to gender was expected. The vast majority of studies reviewed stated that there was a difference between genders when considering the involvement in LTPA (Gomes *et al.*, 2011; Babwah & Nunes, 2010; Byberg *et al.*, 2008; Azevedo *et al.*, 2007; Monteiro *et al.*, 2003; Gomes, Siqueira, & Sichieri, 2001; Martinez-Gonzalez *et al.*, 2001; Burton & Turrell, 2000). Males are expected to have higher LTPA than females (Ainsworth, Berry, Schnyder, & Vickers, 1992). The results of this study coincides with previously published data which investigated gender differences in LTPA, authors concluded that due to the differing levels of physical activity in men and women, and the other variables associated with activity levels, which are also inconsistent across the genders (Azevedo, Araujo, Reichert, Siqueira, Da Silva, & Hallal, 2007). Additionally, authors stated that, any interventions that are to be undertaken to promote increased physical activity and LTPA, should first evaluate and take into account the differences in level of physical activity (Azevedo, Araujo, Reichert, Siqueira, Da Silva, & Hallal, 2007). In contrast, there have been studies that have not noted any significant differences between genders. One such example is the findings of a study undertaken by Moore *et al* (2012), which examined the impact moderate and vigorous intensity LTPA had on the rate of mortality, it was determined that there was no vast difference between the sexes and that they had a fairly similar association when it came to life expectancy and LTPA. Authors deduced that both sexes equally gained more years of life through their participation in LTPA (Moore *et al.*, 2012). Hallal *et al.*, (2003), also stated that no difference was noted between the genders when examining leisure time physical activity (Hallal, Victora, Wells, & Lima, 2003). The disparities between studies may have been rooted in the method used to assess LTPA. The findings of earlier studies appear to be in general agreement with the results obtained in the current study; gender was the only factor that displayed any difference in relation to LTPA. Male participants proved to be more active than female within the study, which was indeed consistent with the aforementioned studies.

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

Conclusion

Based on the results of the study, it can be said that a little less than half (44.4%) the sample population participated in LTPA some of the time in a typical 7-day week, however, a great deal of time is still being spent by members of the population being sedentary and that needs to be addressed. The male employees in the population participated in more LTPA than their female colleagues within the Ministry of Health, and as such more attention should be paid to the physical activity levels among the female population.

Factors such as age, income and job description may also have an effect on the LTPA levels of the population but could not be adequately assessed in the study due to the sample population chosen. The sample may have proved to be too small and did not contain enough variety for any significant relationship to be established.

Limitations

As with any other research study done, limitations were encountered in carrying out the study design. Some of the limitations encountered with the study are:

- The use of self-administered questionnaires as the only source of data collection because it is not a complete measure of the level of leisure time physical activity, participants may have a tendency to underestimate or overestimate their level of physical activity.
- Questions with regards to BMI, height, weight and energy intake in the form of a 3-day food record should have been included in order to get a better idea of the amount of energy truly expended during leisure time, when combined with the activity performed. The metabolic equivalents can then be calculated, which is a useful way of measuring leisure time physical activity.
- The sample population size should have been larger, in order to get a better idea of the populations habits as well as to be able to generalize the findings of the study to larger populations.
- The use of only 10 and 15 minutes as the minimum time for physical activity to be performed within, when the recommended values are 20 minutes for vigorous intensity and 30 minutes for moderate intensity. The results obtained may therefore not serve as a measure of physical fitness.

- The assessment of household activity in addition to leisure time and occupational physical activity may have provided a better idea of total physical activity of participants and provided a comparison of LTPA versus NLTPA. NLTPA has been indicated as a good measure of physical activity when it is combined with LTPA (Lin *et al.*, 2011).
- The absence of questions based on level of educational, which should have been included as a demographic factor may be considered a limitation because education level has been shown to have an impact of LTPA level, individuals with higher educational levels are more prone to participating in LTPA because they know the benefits of regular physical activity.

Recommendations

In order to reduce the amount of limitations, it is important to consider how to improve on the deficiencies of the study. Listed below are some recommendations for researchers intending on undertaking similar studies or expanding on the research done in this study:

- Expand population and time frame for study so data collected would be of a wider spectrum and have more variation in the results. Perhaps the significance expected for age group and socioeconomic status may be established with the expansion of the study.
- Include questions about household physical activity in order to better gauge activity being done only in leisure time, in order to gauge LTPA in relation to NLTPA and investigate the relationship between the two types of physical activity.
- Include height, weight and BMI values and a 3-day food record in order to measure the effect of LTPA on overall fitness and health, in order to obtain a more accurate understanding of the level of energy being expended rather than simply a self-reported value.
- Do interviews in conjunction with self-administered questionnaires and include a knowledge section in order to gauge respondents understanding of the topic; it is believed that more knowledge on the benefits of physical activity leads to increased participation. This will also assist in the issue of participants over and underestimating

the amount of physical activity being reported. The interviewer can ask pertinent questions and make relevant deductions.

- Based on the results, investigate the relationship between ethnicity and LTPA in a larger population, in addition to factors such as age and socioeconomic status because a wide variety of data is unavailable on said factors.

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APPENDIX A

Leisure-time physical Activity Questionnaire

To complete this questionnaire, simply tick (✓) the option that is most appropriate to you, or write an answer in the space provided.

Upon completing and submitting this questionnaire, you are agreeing that you are between the ages of 25 to 55 years old and that you have given consent for the use of your answers in research. Any questions about the questionnaire or the subsequent research may be directed to, Afiya Gaspard – afiya.gaspard@yahoo.com

Thank you in advance for your cooperation and your willing participation, your responses are greatly valued.

Demographics

The following questions will be used as a guide to the type of individuals who have responded to the questionnaire.

Please tick the box ☐ that most appropriately corresponds to you.

1. Age group;

☐ 25 – 35 ☐ 35 – 45 ☐ 45 – 55

2. Gender;

☐ Male ☐ Female

3. Ethnicity;

☐ Afro- Trinidadian

☐ Indo-Trinidadian

☐ Mixed

☐ Other

4. Which of the following best describes your current employment status?

☐ Permanent employee

☐ Temporary employee

☐ Contract employee

5. General Income Range:

☐ Less than \$10,000 per month

☐ \$10,000 to \$20,000 per month

☐ More than \$20,000 per month

Activity at Work

The following questions will be in regard to your job and the activities you perform at work.

6. What type of job would you say you have?

Please tick what best corresponds to your present activities from the following four possibilities:

☐ Sedentary occupation

[You spend most of your time sitting

(such as in an office)]

☐ Standing occupation

[You spend most of your time standing or walking.

However, your work does not require intense

physical effort (e.g. assistant, hairdresser,

guard, etc.)]

☐ Physical work

[This involves some physical effort including

handling of heavy objects and use of tools (e.g.

plumber, cleaner, nurse, sports instructor, electrician, carpenter, etc.)] **(proceed to question 9)**

☐ Heavy manual work

[This involves very vigorous physical activity

including handling of very heavy objects, causes

large increases in breathing and heart rate for at

least 10 minutes continuously(e.g. docker,

bricklayer, construction worker,etc.)] **(proceed to question 7)**

Questions 7 and 8, deal with individuals whose job entails heavy manual work. If you did not select that option, please proceed to question 9.

7. In a typical workweek, on how many days do you do vigorous intensity activities as part of your work?

☐ none

☐ 1 to 2 days

☐ 3 to 5 days

☐ everyday

8. How much time do you spend doing vigorous intensity activities at work on a typical day?

☐ less than an hour

☐ 1 to 2 hours

☐ more than 2 hours

If you selected physical work as the type of activity you partake in at your job, please proceed to answer questions 9 and 10.

9. In a typical workweek, on how many days do you do moderate-intensity activities as part of your work?

☐ none

☐ 1 to 2 days

☐ 3 to 5 days

☐ everyday

10. How much time do you spend doing vigorous intensity activities at work on a typical day?

☐ less than an hour

☐ 1 to 2 hours

☐ more than 2 hours

Travel to and from places

The following questions are in regard to your travel routine, and the way you usually travel to and from places (eg. To work, for shopping, to your place of worship, to the market). This excludes the physical activity already mentioned at work.

11. Do you walk or use a bicycle for at least 10 minutes continuously to get to and from places?

☐ Yes ☐ No

12. In a typical week, how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places? _____

Recreational Activity (Leisure-time physical activity)

The following questions are to be used as a measure of recreational activity. This excludes work and transport physical activity and is dealing solely with sports, fitness and other recreational activity.

13. During a typical 7-Day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

☐ Often

☐ Sometimes

☐ Never / Rarely

14. During a typical 7-Day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number). [Times Per Week]

a) STRENUOUS EXERCISE

(HEART BEATS RAPIDLY) _____

(e.g., running, jogging, hockey, football, soccer,

squash, basketball, cross country skiing, judo,

roller skating, vigorous swimming,

vigorous long distance bicycling)

b) MODERATE EXERCISE

(NOT EXHAUSTING) _____

(e.g., fast walking, baseball, tennis, easy bicycling,

volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

c) MILD EXERCISE

(MINIMAL EFFORT) _____

(e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)

Sedentary behaviour

The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent [sitting at a desk, sitting with friends, travelling in car, bus, train, reading, playing cards or watching television], but do not include time spent sleeping.

15. How much time do you usually spend sitting or reclining on a typical day?

This is the end.

Thank you for participating! \^_^/