ICT USE AND SEDENTARINESS IMPLICATION FOR SUSTAINABLE PHYSICAL EDUCATION AND SPORT PROGRAMMES IN TERTIARY INSTITUTIONS

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Abstract
This study examined the implication of Information and Communication Technology (ICT) Use for Sedentariness in the University Community and the need for sustainable physical education and sport programmes development. ICT use has been established to be one of the leading causes of sedentariness in our contemporary world. Sedentariness is any behaviour characterized by an energy expenditure of < 1.5 metabolic equivalent (MET) and a sitting or reclining posture and is the greatest cause of preventable deaths worldwide that needs to be addressed in Africa. The University of Ilorin community was used as a case study, while correlational method of descriptive research design was adopted. Multistage random sampling technique was used to draw 800 respondents from University of Ilorin The stratified sampling technique was used to select 650 students, 100 University staff, 25 staff of corporate organizations and 25 staff of small scale business organizations. The instrument was a validated and reliability ascertained researcher structured questionnaire. Frequency count and simple percentage were used for analysis of the demographic data while One-Way- ANOVA was used to test the hypothesis at a 0.05 level of significance. It was found that due to ICT use, majority of University of Ilorin community members were inactive, experience musculoskeletal or physiological disorders, mental disorders leading to use of drugs and huge medical bills reducing productivity. This study therefore, recommended that there should be motivating intervention programmes and integration of lifestyle habit of ergonomic considerations for ICT.

Keywords- Sedentariness ICT use Sustainable Ergonomics

Introduction
The development of information and communication technology (ICT) has had a considerable effect on human lives, by affecting how they work, communicate and interact. Modern development via ICT have made it very easy to interact and share information with people over great distance, perform huge tasks at work, school and enhance enjoyment during leisure. Humans constantly striving to do more with greater ease, has placed greater emphasis on ICT use over a few decades of its discovery and changing the pattern of lifestyle from what it used to be (www.espalda.org, 2012). Modern life especially with exposure to ICT and multimedia devices, constantly encourage us to sit down and drives us to seek a comfortable life in which we avoid all physical effort and losing our physical activity culture. People normally use elevator to go up or down, take a few flights, and the car is used to travel hundreds of metres (Dominic, 2003; www.espalda.org,
There has been a shift from high physically active time to an increase in sedentary time (Medical News Today, 2011; www.espalda.org, 2012.).

Pan-narrans (2012), espoused that over the years, the gradual spread from the invention of the home computers, followed by the laptops and other smaller mobile devices have given access to enormous quantities of information through the internet, satellite televisions as well as the ability to engage in several lines of communications, and has led to arrays of users across all academic and business communities and even facebook and other social media. However, using ICT for long hours has been well established to lead to sedentary living.

Ingenious websites such as Wikipedia, the free encyclopedia, and internet search engines akin to Google have also flourished over the years (Wales & Sanger, 2001; Reuters, 2005). Everyone is enabled to retrieve a wide array of information with relative ease via internet connection. Moreover, online social networks (SNs) have gained notable popularity (Anderson & DeWolfe, 2003; Rosenbush, 2006). SNs have given people the ability to communicate impersonally via electronic text (Body & Elison, 2007). Scalet (2007) observed that in 2007 an estimated 150 million user accounts existed on Myspace, and Facebook (2008) reported 50 million user accounts. A large number of Nigerians especially young adults use SNs on daily basis. Socialblakers.com (2012) submitted that there are 6,712, 700 Facebook users in Nigeria, which makes it number 31 in the ranking in all Facebook statistics by country. Premium Times (2012) reported Nigeria as the third most active country on Twitter with 1,646,212 tweets. In today’s world, a lot of people spend endless hours with the use of ICT (Adams, 2004) and hold jobs that require sitting behind the desk for 8, 9 or 10 hours a day; viewing television/DVDs (Proper, 2012). All these activities involve prolonged sitting and mental tasking exposing users to sedentary lifestyle.

**Sedentariness and Physical Activity Continuum**

A sedentary life style or Sedentariness is defined as being inactive at work, at home and failing to participate in exercise for at least 20 continuous minutes for at least three times a week (www.womenshealth.com, 2011). World Cancer Research Fund (2007), defined sedentariness as:

“< 30 minutes of moderate physical activity (equivalent to brisk walking) on fewer than 5 days per week;
< 20 minutes of vigorous physical activity (equivalent to running) on fewer than 3 days per week;
< 60 metabolic equivalent (MET) hours of any combination of activity on fewer than 5 days per week.” Sedentary Behavior Research Network (SBRN) (2012), defined sedentary behaviour as any waking activity characterized by an energy expenditure ≤1.5 MET and a sitting or reclining posture.

The Energy Expenditure Continuum categorized physical activity (PA) as; sedentary, light PA, moderate PA and vigorous PA. Sedentary behaviour is any PA with MET ≤ 1.5, light PA is any PA with MET > 1.5 but ≤ 3, moderate PA is any PA with MET >3 but ≤ 6 and vigorous PA is any PA with MET > 6.

Metabolic equivalents (METs) express energy in multiples that are relative to an individual’s resting metabolic rates. One MET represents the rate of oxygen consumption (VO\(_2\)) of approximately 3.5ml oxygen/kg/minute for an average adult while sitting quietly. An individual performing an activity of 3 METs has a VO\(_2\) three times higher while sitting quietly. Another way to imagine how MET works is that energy used from slow walking (which has a MET of 2.0) increases while body expenditure by 2.0 times more than when seated still (Ainsworth 2000; Levine, Schleusner & Jensen, 2000; Iliasiu, 2013).

Meis, Kremers, & Bouman, (2012) reported that sedentary behavior has been found to be a predictor of weight gain (Wijndaele, Lynch, Owen, Dunstan, Sharp, Aitken, 2009), type 2 diabetes (Krishnan, Rosenberg, Palmer, 2009), cardiometabolic risk (Wijndaele, Healy, Dunstan, et al, 2010),
specific cancers (Howard, Freedman, Park, Hollenbeck, Schatzkin, Leitzmann, 2008), cardiovascular
diseases (Hamilton MT, Hamilton DG, Zderic, 2007), and all-cause mortality and cardiovascular
mortality ([Inoue, Iso, Yamamoto, et al. 2008; Katzmarzyk, Church, Craig, Bouchard, 2009; Dunstan,
Barr, Healy, et al, 2010). Lack of exercise gets the cardiac muscles and heart damaged by
atherosclerosis. The pressure on the arteries and restriction of blood flow to the organs results in
cardiovascular disease and if heightened, could cause cardiac arrest (Schofield, Quigley & Brown,
2009). Despite the evidence, sedentary lifestyles are increasing not only in most Western countries
(Bauman, Armstrong, Davies J, et al.2003 but also in Africa. In addition, prolonged sitting is
associated with the risks of breast cancer and colon cancer which seem to be more influenced by
sitting too much (Colen, 2011) and have been confirmed that less sitting might prevent 37,000 cases
of lung cancer, 30,600 cases of prostate cancer, 12,000 cases of endometrial cancer, and 1,800 cases
of ovarian cancer.

**ICT and Ergonomic Implication**

Thomee, Delli, Haresntam and Hagberg (2010) espoused that musculoskeletal symptoms
have been reported among computer workers and users. Many people, usually due to having bad
sitting posture; suffer from non-specific symptoms from the neck, shoulders, back and upper
extremities, fingers and wrist (e.wikipedia, 2012). This ranges from short term discomfort to serious
conditions known as Carpal Tunnel Syndrome (CTS) (Brayn, 2009; Adeyemi, 2010). Preference
of people now to use laptop computers because of their increased power and portability has made the risk
of CTS higher among laptop users because laptop creates problem for posture and upper body. The
screen is married to the keyboard; therefore, it is not possible to place both the screen and keyboard at
each ones ideal height.

International Labour Organization (ILO) (as cited in Adeyemi, 2010) noted that for many
workers in developing countries like Nigeria, ergonomic problems may not have high priority among
the health and safety problems they face. The reason for this is poor employee welfare and general
lack of awareness among employers and ICT users. This has implication for the communities of
higher learning where academic and administrative works and assignments are carried out with ICT.
In addition, ICT has electromagnetic hypersensitivity with visual display unit affecting the skin and
the eyes which become strained after staring at a computer screen for a long time. The use of small
keyboard on mobile phone have been reported by Thomee, Delli, Harenstam & Hagberg, (2010) and
Steven (2009) to cause musculo skeletal symptoms and pain in thumbs, hands, back and neck, a
condition he described as Teen Texting Tendonitis (TTT). Other physiological symptoms include
headaches, earaches, warmth sensation and fatigue (Thomee et al, 2010). With worse posture causing
users to hunch/flex their head, neck and upper back down toward it (Muscolino, 2012).

**Interlock of ICT Use, Leisure time and Physical Activity**

Owen (2007) pointed out that leisure sitting time was associated with overweight. Similarly,
Brown, Williams, Ford, Ball and Doboson (2005) also observed that there is weight gain in females
with increased sitting time. They said that “women who sat for more than 4½ hours per day were
more likely to have increase in weight by over 5kg within 5 years”. Sedentary time increases the
incidence of higher cholesterol, fasting insulin, over weight and obesity.

Several factors increase the risk of back pain in sedentary people. Kovacs (2003) elucidated
these factors to include lack of muscular strength, lack of physical activity, posture, postural hygiene
and excess weight. CDC (2012) observed that one of the four common causes of chronic diseases
such as heart disease, stroke, cancer, diabetes, obesity and arthritis is lack of physical activity. Martin
(2011) noted that electronics screen use (such as watching television/DVDs, computer use, video
games and portable devices) is the most common leisure activities not only in developing countries
but also many other industrialized countries. Thus they exceed the recommended maximum of two
hours a day of screen use for leisure. Though, ICT makes it possible to work from anywhere, for
instance, at home, in vehicles and other places. The blurring of boundaries between work and private life can cause role stress, role conflict and overload for individuals (Thomee et al, 2010).

Technological stress in term of frustration and stress due to hardware or software problems, slow response times, network failures, drop-calls, failed massages and computer break down have been confirmed to be very common in Nigeria; and this technostress is associated with heightened stress and increased blood pressure because of higher levels of computer dependency as obtained in the university community (Thomee et al, 2010). Sleep disturbance and problems, low mood, sense of loneliness and depression also result from total ICT use and Internet dependence right from childhood and in adulthood (Martin, 2011). Thomee et al (2010) corroborated that internet time spent on shopping, playing games or research has been associated with increasing depressive symptoms.

Research has proven that being physically active later in life depends on an individual's ability to feel confident in an activity setting. That confidence most often comes from having **learned fundamental movement and sport skills, or physical literacy**, as a child. This has implication for school physical education academic and recreation sports programmes in integrating physical activity and ergonomic consciousness lifestyle for sustainable educational development.

Research has also shown that without the development of physical exercise literacy, many children and youth withdraw from physical activity and sport and turn to more inactive and/or unhealthy choices during their leisure time (PHE, Canada, 2013). This has implication for sustainable physical education and sport programmes in tertiary institutions who are the sole producers of manpower in Nigeria. According to Pan-narrans (2012), many developed countries including UK have workplace regulations to prevent problems such as repetitive strain injuries or eyestrain though lack of physical exercise is rarely addressed as a specific health hazard. Such workplace regulations are not obtainable in Nigeria. It is appropriate therefore to examine ICT use as it relates to health and wellbeing in our tertiary institutions and its implication for sustainable physical education and sport programmes to inculcate healthy lifestyle not only among the students but community members as well.

**Research Methodology**

The Descriptive research design of correlation study was used while the population consisted of Permanent members of University of Ilorin which included academic and administrative staff, students and business organizations. A total of 800 subjects were selected for the study using multistage random sampling technique to randomly select 650 students, 50 academic staff, 50 non academic staff, 25 staff of corporate organizations and 25 staff of small scale business organizations. Five research questions and one hypotheses were formulated to guide the study. A validated and reliability established questionnaire instrument titled “Information and Communication Technology Use and Sedentariness Questionnaire (ICTUSQ)” was used. The questionnaire was divided into sections A and B. Section A, focused on respondents’ demographic data such as gender, age, occupation etc., while section B focused on responses were rated using four-point likert type rating scale. The instrument was validated by both face and content validity and r of 0.89 was obtained for reliability. Sample of self-reported ICT behaviours were collected with the aid of the questionnaire forms. The data generated via instrumentation was analyzed using frequency count and simple percentage for the demographic data and answering of the research questions. Similarly, inferential statistic that is One-Way analysis of variance (ANOVA) was used to test the hypotheses at a 0.05 alpha level of significance.
Results
Demographic Characteristics
For gender, 60.2% (462) of the respondents were male and 39.8% (305) were female. Majority of the respondents fell within the ages of 15-19 years with a frequency of 35.2% (270) while the lowest frequency; 2.5% (19) were within the age range of 35-39. In addition, 84.4% (647) of the respondents were single, 15.5% (199) were married and; 0.1% (1) was divorced.

Occupationally, 84.2% (646) were students, 6.5% (50) were academic staff, 5.9% (45), non academic staff, 1.0% (8) self employed and 2.3% (18) staff of corporate organization. The respondents engaged in different types of job and made use of ICT; 4.6% (35) were typists, 2.9% (22) were computer analysts, 4.6% (23) were lecturers, 2.9% (22) were bankers, 1.4% (11) were self employed, 2.3% (18) were accountants and 82.9% (636) were students.

Table 1
Research Question 1: Are University community members active users of ICT facilities?
Frequencies and Percentages of Type of activity ICT Users often engage in

<table>
<thead>
<tr>
<th>S/N</th>
<th>Indicators</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Viewing TV/DVD</td>
<td>221</td>
<td>274</td>
<td>201</td>
<td>71</td>
</tr>
<tr>
<td>2</td>
<td>a) telephone calls</td>
<td>291</td>
<td>407</td>
<td>47</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>b) chatting online</td>
<td>256</td>
<td>441</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Using computer</td>
<td>238</td>
<td>298</td>
<td>172</td>
<td>59</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>251.5</td>
<td>355</td>
<td>265.5</td>
<td>44.2</td>
</tr>
</tbody>
</table>

In Table 1, majority of the respondents, 28.8% (221) strongly agreed and 35.7% (274) agreed that one of the activities ICT users often engage in is TV/DVD viewing; 37.9% (291) strongly agreed and 53.1% (407) agreed that ICT users often make telephone calls regularly, chat online; (33.4% (441) strongly agreed and 57.5% (441) agreed; while 31.0% (238) strongly agreed, 38.9% (298) agreed that ICT users regularly use the computer. This implies that majority of University of Ilorin community members are active users of ICT.

Table 2
Research Question 2: Does ICT use reduce the desire to engage in physical exercise among University of Ilorin community members?
Frequency and Percentages of Respondents on ICT Use and Desire to engage in Physical Exercise

<table>
<thead>
<tr>
<th>S/N</th>
<th>Indicators</th>
<th>SA</th>
<th>Agree</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ICT use is more comfortable than physical exercise</td>
<td>130</td>
<td>195</td>
<td>386</td>
<td>56</td>
</tr>
<tr>
<td>2</td>
<td>Too busy to exercise but find time to use ICT</td>
<td>211</td>
<td>410</td>
<td>87</td>
<td>59</td>
</tr>
<tr>
<td>3</td>
<td>No work place regulation on involvement in physical exercise and ICT use</td>
<td>199</td>
<td>205</td>
<td>335</td>
<td>28</td>
</tr>
<tr>
<td>4</td>
<td>Always participate in 3-5 times weekly exercise for 30 -40 minute per day</td>
<td>86</td>
<td>181</td>
<td>258</td>
<td>242</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>156.5</td>
<td>247.8</td>
<td>265.5</td>
<td>96.2</td>
</tr>
</tbody>
</table>

In Table 2, majority of the respondents, 16.9% (130) agreed and 25.4% (386) disagreed that ICT use is more comfortable than physical exercise; 27.5% (211) agreed and 53.5% (410) disagreed that ICT use is more comfortable than physical exercise; 25.9% (199) agreed and 26.7% (335) disagreed that ICT use is more comfortable than physical exercise; and 11.2% (86) agreed and 23.6% (258) disagreed that ICT use is more comfortable than physical exercise.
In table 1, the indicators for verifying whether ICT use reduces the desire to engage in physical exercise among members of university of Ilorin community show the following responses; Majority of the respondents 50.3% (382) disagreed and 7.3% (56) strongly disagreed that ICT use is more comfortable than physical exercise but 27.5% (211) strongly agreed, and 53.5% (410) agreed that though they are too busy to exercise but still find time to use ICT during leisure. Similarly, 25.9% (199) strongly agreed, and 26.7% (205) agreed that there is no workplace regulation on involvement in physical exercise due to long hours of ICT use while others (335; 43.7%) disagreed and (28; 3.7%) strongly disagreed. However, most of the respondents 33.6% (258) disagreed, and 31.6% (242) strongly disagreed, indicated that they do not exercise 3-5 times weekly for at least 30 minutes day. This finding shows that ICT use reduce the desire to engage in physical exercise among members of the University of Ilorin community.

Table 3
Research Question 3: Does ICT use lead to physiological/musculoskeletal disorders among University of Ilorin community members?
Frequencies and Percentages of Common Physiological / Musculoskeletal disorders

In table 3, the most prevalent physiological or muscular skeletal defects of ICT use are pain in the shoulder with (198; 26.8%) strongly agreed, (269; 25.7%) agreed; pain in the thumb (tendonitis) (316; 41.2%) strongly agreed (210; 15.5%) agreed. In the case of long periods of phone call (251; 32.7%) of the respondents strongly agreed, (340; 44.8%) agreed they experience ear warmth which is associated with threshold shifts during long duration of phone calls. Similarly, 24.6% (189) strongly agreed while 40.9% (340) that they suffer eye strain while using the computer or handset respectively. 18.4%(141) strongly agreed, 40.5% (311) agreed to consumption of high energy food while using ICT; Also 33.6%(258) strongly agreed, 47.2% (362) agreed that they find it difficult to suitably position their laptops while they use them,. This finding shows that ICT use lead to physiological/musculoskeletal disorders among University of Ilorin community members.

Research Question 4: Does ICT use lead to any mental defects among university of Ilorin community members.

Table 5: Frequencies and Percentages on ICT Users and Mental Defects

<table>
<thead>
<tr>
<th>S/N</th>
<th>Indicators</th>
<th>SA</th>
<th>%</th>
<th>A</th>
<th>%</th>
<th>D</th>
<th>%</th>
<th>SD</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Handset addiction</td>
<td>456</td>
<td>59.5</td>
<td>190</td>
<td>24.8</td>
<td>62</td>
<td>8.1</td>
<td>59</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Mean 190.1 24.8 256.3 33.4 185.8 24.2 134.7 17.6
Table 5, majority of the respondents strongly agreed and agreed to handset addiction, (456; 59.5%) strongly agreed, (190; 24.8%) agreed; negligence of body signals for rest and physical activity while using ICT was (456; 59.5%) strongly agreed (190; 24.8%) agreed, experience anxiety and depression (212; 27.6%) strongly agreed, (372; 48.5%) agreed; information overload especially while browsing the internet (246; 32.1%) strongly agreed, (280; 36.5%) agreed; responses indicate that there is a correlation between ICT use and mental defects among university of Ilorin community members.

**Table 5**

Research Question 5: Does ICT use encourage prolonged sitting hours among the members of University of Ilorin community?

**Frequencies and Percentages on ICT Use and Prolonged Sitting Hours**

<table>
<thead>
<tr>
<th>S/N</th>
<th>Indicators</th>
<th>SA</th>
<th>%</th>
<th>A</th>
<th>%</th>
<th>D</th>
<th>%</th>
<th>SD</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Continuous sitting at the computer</td>
<td>264</td>
<td>34.4</td>
<td>282</td>
<td>36.8</td>
<td>90</td>
<td>11.7</td>
<td>131</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td>for at least 4 hours Daily.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Leisure time TV/DVD DVD sitting</td>
<td>68</td>
<td>8.9</td>
<td>391</td>
<td>51.0</td>
<td>224</td>
<td>29.2</td>
<td>84</td>
<td>11.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Continuous sitting on Saturday for</td>
<td>69</td>
<td>9.0</td>
<td>281</td>
<td>36.6</td>
<td>259</td>
<td>33.8</td>
<td>158</td>
<td>20.6</td>
</tr>
<tr>
<td></td>
<td>at least 3 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Duration of ICT Use on Sundays</td>
<td>93</td>
<td>12.1</td>
<td>252</td>
<td>32.9</td>
<td>293</td>
<td>38.2</td>
<td>129</td>
<td>16.8</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>123.5</td>
<td>16.1</td>
<td>301.5</td>
<td>39.3</td>
<td>216.5</td>
<td>28.2</td>
<td>125.5</td>
<td>16.4</td>
</tr>
</tbody>
</table>

In table 5, Majority of the respondents strongly agreed (264;34.4%) and (282;36.8%) agreed that they sit at the computer continuously for not less than 4 hours daily; strongly agreed, (68; 8.9%), (391; 51.0%) agreed they spend their leisure hours sitting to view TV/DVD than they use the computer or handset - strongly agreed (246; 32.1%) and agreed (280; 36.5%) they experienced information overload especially while browsing the internet while others did not. However, their pattern of ICT usage on Saturdays and Sundays is not as high as the week days (see table 5).

**Table 6**

**Hypotheses Testing:** Gender, occupation, age and type of job do not make significant difference between ICT use and prolonged sitting hours among members of University of Ilorin community.

**One-Way-ANOVA of ICT Use and Prolonged Sitting Hours**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model</th>
<th>Sum of squares</th>
<th>Df</th>
<th>Mean square</th>
<th>F Val</th>
<th>Crit. Val.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Regression</td>
<td>152.298</td>
<td>9</td>
<td>16.922</td>
<td>407.73</td>
<td>1.90</td>
<td>Sig</td>
</tr>
<tr>
<td></td>
<td>residual</td>
<td>31.418</td>
<td></td>
<td>757</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>183.716</td>
<td></td>
<td>766</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Regression</td>
<td>1988.816</td>
<td>2</td>
<td>220.980</td>
<td>1.220</td>
<td>240.54</td>
<td>Not sig</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>137.061</td>
<td></td>
<td>757</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2125.877</td>
<td></td>
<td>766</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Regression</td>
<td>291.587</td>
<td>9</td>
<td>32.399</td>
<td>163.794</td>
<td>1.94</td>
<td>Sig</td>
</tr>
</tbody>
</table>
In table 6, the hypothesis tested at a 0.05 alpha level of significance showed the following that except for age (F.value 1.22> crit.value 240.54), gender (F.value 407.73> crit.value 1.90), occupation (F.value 163.79> crit.value 1.94) and the type of job (F.value 639.453> crit.value 1.90) engaged in make significant differences between ICT use and prolonged sitting hours among University of Ilorin community members. (See table 6 above). Therefore, the hypothesis is rejected based on occupation, type of job, and gender thereby indicates that there is a significant relationship between ICT use and prolonged sitting hours among members of University of Ilorin community based on gender, occupation, and type of job only.

Discussion of Findings

The most prevalent physiological or muscular skeletal defects of ICT use are pain in the shoulder; pain in the thumb (tendonitis) as a result of long periods of phone call and ear warmth which is associated with threshold shifts during long duration of phone calls which according to Thomee et al (2010) could cause deafness. Similarly, the university community members suffer eye strain while using the computer or handset indicated high consumption of energy food while using ICT. Frequent consumption of high energy food in sedentary workers have been well documented to lead to obesity, reduced cardiovascular fitness and increased risk of dying from heart disease (Adam, 2004; Martins, 2011 & Schofield, Quigley & Brown, 2009). Finding it difficult to suitably position their laptops while they using them, confirmed the opinion of Muscolino (2012) that the risk of carpal tunnel syndrome is high in users of laptop because it creates problem for posture and upper body. This finding shows that members of university of Ilorin community are at a high risk of musculoskeletal defects due to the use of ICT.

Concerning ICT use and prolonged sitting hours, members of university of Ilorin community sat a lot using ICT. Apart from work or studying purpose, majority of them exceeded the recommended maximum of two hours of ICT use per day for leisure just as discovered by Martins (2011) on ICT sitting hours in industrialized countries. This implies a high risk of obesity, cancer and mortality rate among members of University community because of prolonged sitting hours (Mummery et al., 2005; Colen, 2011; and Owen, 2012).

The hypothesis tested demonstrated significant differences existed. However, Age was not a determinant factor for prolonged sitting hours when using ICT per day (1.220<240.54). Other factors, gender (407.726>1.90), occupation (163.794>1.94) and type of job (639.453>1.90) were found to be major determinant factors of prolonged sitting time for ICT use thereby exposing people to sedentariness. This showed that prolonged sitting due to ICT varies based on gender, occupation and type of job. This finding corroborated other researches. Adams (2004) confirmed that today’s world let people for 8, 9 or 10 hours a day spending endless hours watching sedentary behaviour. Lower sperm count in men who watched TV for more than 20 hours per week (Gutierrez, 2013), increased waist circumference in women (Healy et al., 2008), higher BMI, overweight in youths, decreased metabolic rate and uneven energy balance (Martin, 2011), breast cancer, colon cancer (Colen, 2011) and increased mortality rate (Patel, 2010). Are all well documented. It can be predicted based on this that risk of lower sperm counts, obesity, type 2 diabetes, prostate cancer, cervical cancer, stroke, osteoporosis and other sedentary behaviour related diseases is high among members of University of Ilorin community.
Patel (2010) ‘s study of 123,000 subjects found that mortality rate rose in proportion to the amount of time people spent in their seats and that women are far more affected than men. While women who sat for more than six hours per day had a 37 percent mortality rate than those who sat fewer than three hours a day, men in the over six hours category only had 18 percent increased risk. Other health risks associated with Sedentariness are obesity, effects on the brain and mental health (Olsen, 2012; Martins, 2011; Proper, Brown & Owen, 2007). For female viewing time (from 0.71 hours/day to 1.43 hours/day; to 1.44 hours/day to 2.14 hours/day; to > 2.14 hours/day), waist circumference was found to increase significantly (1.65cm; 1.83cm; 422cm) compared to those in the lowest TV viewing category (Healy, Dunstan, Salmon, Shaw, Zimet & Owen; 2008). Such sedentary behaviors cannot be uncommon in Nigeria.

**Conclusion**

Based on the findings of the study the following conclusions were drawn:

1. ICT use could lead to sedentary living by reducing activeness and desire to engage in physical exercise  
2. Prolonged ICT use lead to physiological/musculoskeletal and mental disorders.  
3. The use of ICT encouraged prolonged sitting hours among ICT users but varied with respect to gender, occupation and type of job.

**Recommendations**

In view of the findings of the study the following recommendations were made.

1. Those who depend heavily on ICT either at work or for study purpose should take regular breaks of at least 5 minutes each hour to walk around, climb the stairs and stretch.  
2. Ergonomic consideration and physical exercise should be given high priority at work and school. At home, leisure time should not be spent using ICT alone but combined with exercise.  
3. There is a need for sustainable physical Education and sport programmes in the academia in order to inculcate physical exercise culture in their products through awareness seminars, repositioning staff games, university sports and physical education teacher preparation, admission and training process to impart and motivate the general public to adopt a life style policy “to move more, sit less”.

**References**


