*International Journal of Arts, Languages and Business Studies (IJALBS), Vol.6; April, 2021; pg. 215 - 228*

# HEALTH RISK COMMUNICATION, AWARENESS AND COMPLIANCE WITH PRECAUTIONARY MEASURES TOWARDS BAD CHOLESTEROL BUILD-UP AMONG SEDENTARY WORKERS IN UNIVERSITIES IN SOUTH-EAST NIGERIA

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**Abstract**
*The challenges posed by sedentary behavior, especially in the 21st century, where the nature of people's work entail sitting for long hours is increasingly becoming worrisome. The more they sit, the more their health is affected. Extant literature has shown that sedentary lifestyle is associated with a number of health issues; prominent among these health issues is cholesterol build-up, also referred to as hypercholesterolemia – this condition is no doubt hazardous to health. This study therefore carried out investigation into the awareness and compliance with precautionary measures towards bad cholesterol build-up among sedentary in universities in South-East, Nigeria. The study made use of survey research design. The sample size of 609 was randomly selected using the Krecie and Morgan sampling procedure. Anchored on Health Belief Model, the studies found out the following: sedentary workers in universities in the South East were significantly exposed to health risk communication on bad cholesterol. It also discovered that a good number of them were aware of messages on the health risk of bad cholesterol. Finally, the study showed that sedentary workers in universities in South-East Nigeria did not really comply with precautionary measures they were exposed to reduce the risk of bad cholesterol. The researchers recommended among others that given the inadequate level of adoption of precautionary measures as discovered by this study, bad cholesterol communication among university workers in South-East Nigeria should emphasise adoption of such measures as well as highlight the consequences of failing to do so. This may help persuade the audience to embrace and sustain such health action.*

**Keywords:** Bad cholesterol, Awareness, Exposure, Compliance, Sedentary work

## Introduction

One of the most visible changes that modernity has thrust on today's individual is the increasing shift from a life of standing activities to that of sitting activities (Crichton & Alkerwi, 2015; Mfrekemfon, Inyang & Okey Orji; 2015; WHO, 2018). As a country that has assimilated the Western way of life, Nigeria has become fully integrated in a global culture wherein a number of people are adopting a pattern of living involving habitual sitting for a lengthy period of time daily. This development is somewhat predicated on increasing urbanization, growing rural-urban migration, mechanization, automation, increasing access to western education and the attendant embrace of white collar jobs which all ensure that many individuals are now engaged in occupations that largely exclude vigorous body movements (Adeotun, Akinwusi & Jacob, 2018). In fact, research has shown that virtually 80% of jobs available to the contemporary human are sedentary in

nature; i.e. involving little or no physical activity (Bush, 2018, p.123). In fact, sedentary lifestyle is implicated to be associated with a host of health risks, including obesity, high blood pressure, cancer, diabetes type II, weight gain, metabolic syndrome, mental health, back/neck pain, depression, anxiety and osteoporosis among many others (Knight, 2012; Shehu *et al.,* 2010; David, 2002, p.340).

However, among the health risks of sedentary lifestyle is high cholesterol problem also known as hypercholesterolemia or hyper-lipidemia. Cholesterol, a fatty substance produced in human body, may be considered good or bad, depending on its make-up. Thus, there is good cholesterol and bad cholesterol. Research has demonstrated that the build-up of bad cholesterol in human body poses a serious health risk (American Heart Association, 2017). Bad cholesterol also forms fatty deposits in arterial walls which may eventually grow, rupture and stimulate the formation of artery-blocking blood clots (Nishi, Itabe & Uno, 2000). In Nigeria, bad cholesterol build-up has been identified as a major public health issue. It is estimated that millions among the population have been affected by this disease. In fact, bad cholesterol build-up is today noted as one of the major killer diseases in the country (Adeotun *et al.,* 2018; Ogungbenle, Omeonu, Aduroja, & Kukoyi, 2017). It is therefore on the above premise that this study became imperative.

**Statement of Problem**

Empirical evidence has over time clearly demonstrated that approximately two million people die each year as a result sedentary lifestyle (WHO, 2009; Kandola, 2018). It is as a result of this massive death rate that World Health Organisation in 2019 issued a warning that sedentary lifestyle could very well be among the ten leading causes of death and disability in the world (WHO, 2020). In Nigeria, however, studies that have implicated sedentary lifestyle as a leading cause of death also abound (Adeloye, Elegbede, Auta, Ezeigwe, Omoloye & Alemu, 2021; Aderigbe, Sule, Olatana, Goodman & Sekoni, 2017). Research has also shown that hypercholesterolemia or bad cholesterol build-up is one of those health conditions associated with sedentary work – the implication of this is that long hours of sitting is today a predisposing factor to accumulation of bad cholesterol and has continued to affect the health of people (David, 2002, p.340) More so, irrespective of the level of awareness campaigns accorded to the health risk of sedentary lifestyle, as per bad cholesterol build-up, the level that the audience has complied with these health awareness campaign messages has remained low (Nwosu, Chukwuka & Ajagu, 2021). It is based on this that certain questions are raised, such questions like; to what extent are people exposed to the messages on the health risk of sedentary and bad cholesterol build-up? Are they really aware of these messages? If they are, to what extent do they understand, and as it were, comply with the contents of these health messages? This research work particularly sought to examine the problems raised by above questions.

**Research Objectives**

The goal of the study in particular is to carry out investigation into the health risk communication, awareness and compliance of bad cholesterol build-up among sedentary workers in Universities in South East, Nigeria. In more precise terms however, the following specific objectives were pursued:

I. To discover the extent that sedentary workers in Universities in South-East Nigeria are aware of health risk communication on bad cholesterol build up.

II. To discover the extent that sedentary workers in Universities in South-East Nigeria are aware of health risk communication on bad cholesterol build up.

III. To find out the extent that sedentary workers in South-East Nigeria comply with precautionary measures to reduce the risk of bad cholesterol.

**Research Questions**

The following research questions were addressed in this study>

I. To what extent are sedentary workers in Universities in South-East Nigeria exposed to health risk communication on bad cholesterol build up?

II. To what extent are sedentary workers in Universities in South-East Nigeria aware of health risk communication on bad cholesterol build up?

I. To what extent do sedentary workers in South-East Nigeria comply with precautionary measures to reduce the risk of bad cholesterol?

**Literature Review**

**The Sitting Disease and Bad Cholesterol Build-Up: Concerns over Sedentary lifestyle and Bad Cholesterol Build up.**

According to Walker (2009, p.145) "A person living a sedentary lifestyle is often known to be sitting or lying down while engaged in an activity like reading, socializing, watching television, playing videogames, using a mobile phone/computer or even working in an office for much part of the day" In other words, sedentary lifestyle is that which an individual or group of people adopt that does not permit regular exercise or physical activity.

Sedentary behaviour or lifestyle has two distinct characteristics that deal with sitting down or reclining; it also involves low energy expenditure (Sedentary Behavior Research Network, 2012). It might be instructive here to note that standing is not in actual fact a sedentary behaviour, as it occurs in the upright position. Similarly, cycling is not also considered sedentary in nature as it usually occurs in a higher intensity.

According to Sedentary Behavior Research Network (2012, p.12), "To be sedentary would conceptually mean performing insufficient amounts of moderate to vigorous intensive physical activity" Sedentary behavior have been implicated as leading to serious health challenges; the lifestyle can potentially contribute to ill health and many other preventable cases (Biwas, Faulkner, Bajaj, Silver, Mitchell & Alter 2015). Mfrekemfom *et al. (*2015, p.123) argue that "man was originally created to be active and energetic, but as a result of modernism and development had jobs and vocations that him to sedentary in nature".

Interestingly, research data generated from across 20 countries, Nigeria inclusive, show that the median sitting time among sedentary workers on a usual weekday was about five hours a day (Craig & Bull, 2011, p.23). Studies show the following statistics of some countries and their level of sedentariness; for Taiwan, Hong Kong, and Japan reports show higher median sitting times, close to six hours per day in their sedentary nature (Mathew, Chen, Freedson & Beech, 2003). In similar study, United States, United Kingdom and Australia, adults were reported to spend nearly nine hours per day sedentary time (Mathew, Chen, Freedson & Beech, 2003; Bennie, Pedisic, Timperio, Crawford & Buman, 2015). Such trends were also noticeable in countries like: Singapore, France, Barbados, Canada, Australia and Brazil as they were reported to up to 7 to 8 hours sitting time. In Nigeria, the situation is akin to what obtains in other climes, as workers in Nigeria was reported to spend 7-8 hours, close to the number of hours spent in the United Kingdom and United States – the number of hours (Oyeyemi and Adegoke 2017, p.5).

It might be crucial to note that in the recent time, a number of studies have shown that 80% of the contemporary jobs are sedentary in nature – they involve little or no physical activity (Adewale *et al.*, 2017). Bush (2018) lends credence to above submission when he argues, "A lot of jobs are considered to be sedentary in nature. These jobs include, although not limited, to bank jobs, jobs that involve computer operation, teaching jobs, administrative or accounting jobs, truck driving, security or surveillance jobs, legal professions, lecturing jobs, etc". World Health Organisation (2018) provides deeper insight into the prevalent nature of sedentary work globally this way "

> One in four adults globally (28% or 1.4 billion) are physically inactive; engaging in one sedentary work or the other. However, in some countries, the figure can be as high as one in three adults. Also, women are less active than men, with an over 8% difference at global level (32% of men against 23% of women). The WHO data also show that high income countries are more inactive (37%) compared to middle income (26%) and low income countries whose level of inactivity is 16%

Interestingly, International Research on Sedentary Behaviour (2018) has also shown overwhelming evidence that "a multitude of serious health risks may that people go through in the recent time is covertly or overtly be connected to prolonged and excessive sitting" In addition a number of empirical research evidence has shown that sedentary behaviour has significantly correlated with such diseases like cancer, diabetes, weight gain, metabolic syndrome, mental health, back/neck pain, depression, anxiety, osteoporosis and high cholesterol build up (Shehu, Abdullahi & Adekeye, 2010; Knight, 2012).

Research has shown that cholesterol remains one of the very vital substances that the body of humans needs to develop (American Heart Association, 2017, Tobas, 2002). This substance has been identified to play key role in the health of human heart. Cholesterol is particularly a fatty substance that comes from two sources in human body – the first being the liver and the food derived from animals. The type of cholesterol derived from food is called dietary cholesterol, such food consumed by humans like meat; dairy products etc contain cholesterol (American Heart Association, 2017). There are popular misgivings of cholesterol being an enemy of health and longevity, research however has shown that this cholesterol remains increasingly vital for the proper functioning of the human body (Hume, 2003) The reason that cholesterol remains an essential substance to the life of humans is that it is needed for the synthesis of bile acids, bile acids are essential s for absorption of fats and many other hormones such as testosterone, estrogen, dihydroepiandrosterone, progesterone and cortisol necessary for a number of important functions of the body (Corliss, 2019; Kriegermeier & Green 2020).

There are types of cholesterol (lipoproteins) that exist, however, the two most abundant are the Low-Density Lipoprotein (LDL) and the High-Density Lipoproteins (HDL). The main function of LDL is to transport cholesterol from the liver to tissues into cell membranes, while HDL carries old cholesterol that has been discarded by cells back to the liver for recycling and excretion (Coplo, 2005, p. 12). Cholesterol is considered to be either good or bad, that is there is bad and good cholesterol. High-Density Lipoprotein (HDL) is referred to as "the good cholesterol". This type of cholesterol is empirically proven to be good for human health, while the Low-Density Lipoprotein (LDL) is referred to as "the bad cholesterol" (Wang, Zhang, Zhao, Dong, Wu & Zong, 2020). The bad type of cholesterol is regarded as bad because it is known to be hazardous to human heart (Hua & Malinski, 2019, p.33). The high density lipoprotein (HDL) is on the other hand is a heart-friendly lipoprotein; it is known to counter the action of the low density lipoprotein (LDL) and known to remove cholesterol from the arteries and transporting it back to the liver for safe disposal. Contrarily, the low density lipoprotein (LDL) forms fatty deposits in arterial walls "and eventually becomes plaques that grow, rupture and stimulate the formation of artery-blocking blood clots" (Nishi, Itabe & Uno, 2000, p.234) This situation most time results to what is medically known as "angina" (chest pain) and can lead to heart attack (Murrel, 2017, p.111).

Bad cholesterol build-build up therefore is a global health concern. Sadly, unlike other medical situations like cancer, HIV, malaria, yellow fever and even the very recent COVID-19 pandemic (Adepoju, 2016, p.67) bad cholesterol build-up hardly receives the type of awareness campaign received by these other health concerns – this therefore constitutes more health concern globally; Nigeria is also not an exception.

**Exposure, Awareness and Compliance as Critical Variables for Effective Health Communication on Sedentary Behaviour and Bad Cholesterol Build Up**

Exposure, awareness and compliance remains very critical variables in every health communication programme (Nwosu, Okeke and Chiaghana, 2020). These variables are important based on the fact that for behaviour change, which is the ultimate purpose for every health risk communication to occur, they must be properly put into perspective (Nwosu, Okeke and Chiaghana, 2020). In the context we discuss these three variables, it might be very important to note that before individuals are encouraged to embrace a behavoiur change that will help them address certain health challenges, there must as a matter of great importance be exposure to health messages that emphasize such changes (Okunna and Omenugha, 2012). It is only when the audience get exposed to these messages that they become aware of it. Awareness on the other hand increases the consciousness of the receiver and this also leads subsequently leads to increases in knowledge about a health risk. When people become knowledgeable about health situations, there is the possibility that they will adhere, practice and or comply with precautionary messages preached by health campaigns (Okoro, Nwachukwu & Ajaero, 2015).

Exposure is the first port of call of any health message; it is the point when people are open or get to access messages (Nwosu et al, 2020) Exposure is importantly the first point of contact for the audience or receiver of health message (Okunna & Omunugha, 2012; Ndolo, 2015). In health information dissemination, it is at this point that the receiver gets in contact with health messages; at this point, there is an establishment of the fact that there is a message – in other words, the health message content is accessed at the exposure level-access consequently prepares the receiver of for another level of understanding known as awareness. The word awareness means the ability to directly know and perceive. It means to feel or be cognizant of events. More broadly, awareness is the state of being conscious of something. Cambridge Dictionary (2000) explains awareness as "the knowledge that something exists, it is acquaintance, conciseness; understanding of a situation or subject at the present time, based on information or experience" Similarly, Merriam Webster Dictionary defines awareness as, "knowing of something (such as awake, conscious, vigilance, watchful and wary). In the same vein, Hornby (2000) says awareness is "the knowledge or perception of appreciation, consciousness, familiarity or fact - the concern about, and well informed interest in a particular situation or development). Awareness is a term used to denote "knowledge created through interaction of an agent and its environment - the knowledge of what is going on Nwosu, Okeke and Chiaghana (2020) citing Don (2000).

Health messages that are sent through interpersonal communication, the mass media and other media outlets have a single goal; that goal is to achieve bahavoiur change – change from a particular negative health practice to the positive one. For example, the ultimate purpose of a message that focuses on the receiver's awareness, knowledge and practice of good health habits towards avoiding of bad cholesterol build-up is to help the receiver acquire knowledge and consequently, comply with such precautionary measures emphasized by the health message. Compliance is a very imperative variable in the chain of health message effects. Compliance has particularly got to do with practice or taking health actions geared towards avoiding or proactively managing health concerns (Nwosu, Okeke & Chiaghana, 2020, p.12). It is at this point that the receiver of any health message put into action what he/she received from a channel. When receivers fail to comply with the intended health messages, such health messages would be deemed to have failed (Okpoko, 2015).

Although the above variables remain highly essential in every health communication process, research has demonstrated that there are factors that hinder their success. Such factors may include; socio-economic factors, framing of messages, infrastructures, religion, culture, cognitive biases, literacy level, environmental factors, pre-existing behaviour, cost benefits, availability of health services etc (Okoro et al. 2015; Okpoko, 2015)

**Theoretical Framework**

This study is supported by the Health Belief Model (HBM). The model is a theory developed in 1950 by Geoffrey Hochbaum with further work done on it by Becker, Heffner and Maime in 1977. The model

addresses personal knowledge and beliefs used in health promotion to design intervention and prevention programmes, with focus on assessing health behaviour of individuals through examinations of perceptions and attitudes someone may have towards a disease and negative outcomes of certain actions (Burke, 2013, p.1).

Health belief model clearly explains why sometimes people do not respond positively to health campaigns, irrespective of the benefits derivable from them. Based on the core assumptions of the model, people are likely to accept and adopt health interventions if they meet the following conditions:

> believe that they are susceptible to the condition (perceived susceptibility), believe that conditions have serious consequences (perceived severity) feel that taking action would reduce their susceptibility to the condition or its severity (perceived benefits) believe that cost of taking actions (perceived barriers) are outweighed by the benefits. When they are exposed to factors that prompt action (e.g. television, advert or a reminder from ones physician to get mammogram) (cue to action) (National Cancer Institute, 2005, p.24)

In other words, when viewed from the foregoing, it might becomes logical to argue that when people are exposed to health messages that revolve around the challenges of sedentary behaviour and its accompanying bad cholesterol build-up problem, there is usually the possibility for receivers of such messages to comply with the contents. This possibility however is increased when the receiver of this health message believes strongly that he/she is susceptible to high cholesterol build-up. Similarly, when they find bad cholesterol build-up as factor that causes serious consequence for their improved living, there is also the tendency that they will comply with the precautionary measures. They will also comply with such messages when they are exposed to factors that prompt them to take action. However, they might fail to comply with such messages when they feel that the cost of those precautionary measures will outweigh the benefits they will derive

**Methodology**

The survey research was method adopted for this study. This type of research design is quantitative in nature. Babbie (2010, p.85) describes the survey design as "an excellent method for measurement of attitude and opinion of people within a large population". This design adopted entails asking the respondents about their opinion on the subject matter.

**Population of the Study**

The population of the study was all the staff members of universities in the South-East Nigeria. These comprised both teaching and non-teaching staff members. By virtue of the nature of their jobs, university workers continuously spend long hours sitting. While the non-teaching staff ordinarily carries out their administrative tasks on desk, their teaching counterparts spend a large part of their non-classroom time marking scripts, reading, writing and doing other tasks requiring sitting, even as some of them may also sit while teaching. The foregoing justified the choice of this population for a study of this nature. Based on data obtained from the registries of the respective institutions, the sum of this population was 53, 357.

**Sample Size and Sampling procedure**

The sample size for the survey was determined by making reference to the sample sizes as worked out by Krejcie and Morgan (1970) for different population ranges. This is as reflected in Table 2 below as reflected in the table below:

**Table 1**
**Populations and Sample Sizes as Suggested By Krejcie and Morgan (1970)**

| | Error Margin = 5% | |
|---|---|---|
| **Population Size** | **95% Confidence Level** | **99% Confidence Level** |
| 100 | 80 | 87 |
| 500 | 217 | 285 |
| 1, 000 | 278 | 399 |
| 10, 000 | 370 | 622 |
| 100, 000 | 383 | 659 |
| 500, 000 | 384 | 663 |
| 1 million and above | 384 | 663 |

Since the study population was 53, 357 (i.e. up to 10, 000 but less than 100, 000), the researcher settled for 622. Thus, the sample size was 622.

The sampling procedure was multi-staged. At the first stage, the researcher selected three states out of the five in South-East Nigeria. The selection followed the random approach. The states were written down in alphabetical order and numbered accordingly, then, employing a table of random numbers, the researcher selected three states: Abia, Anambra and Imo.

At the second stage, the researcher selected three universities from each of the three states selected at the first stage; one federal, one state and one private. Each of the three states had just one federal and one state university, hence these were automatically selected. For the private universities, a list was made for each state wherein the institutions in it were arranged in alphabetical order and accordingly numbered. Then, using a table of random numbers, the researcher selected one. This resulted in a total of nine universities spread across the states i.e. three federal universities, three state universities and three private universities. The selection went as follows:

i. Abia State – Michael Okpara University of Agriculture Umudike, MOUAU (Federal), Abia State University Uturu (State), and Gregory University Uturu (private)

ii. Anambra State – Nnamdi Azikiwe University Awka (federal), Chukwuemeka Odumegwu Ojukwu University Igbariam (state), and Madonna University Okija (private).

iii. Imo State – Federal University of Technology Owerri (federal), Imo State University Owerri (state), and Hezekiah University Nkwerre (private).

At the third stage, the researcher selected the sample units (i.e. individual staff members). The list of the teaching and the list of the non-teaching staff members were obtained for each university. Then, a table of random numbers was used to select an assigned number from each category. The following formula was adopted for determining the number of sample units to be assigned to each university:

$$X = \frac{n}{N} \times \frac{622}{1}$$

Where X = number of units to be assigned to each university
n = staff population of each university
N = Total population of the nine universities

**Data Presentation and Analysis**

In presenting and analyzing the data gathered for this study, the researchers made use of Statistical Package for Social Sciences (SPSS) in obtaining frequencies and percentages. Statistical tables were also employed in the data presentation. This method became crucial in other to interpret the relationships between different variables.

**Demographic Variables**

Data analysed in the demographic area of the study indicate that greater percentage of the respondents (52.9%) were females against (47.1%) of them who are males. About 11.8% of them were between the age brackets of 18-28 years, 50.1% of them fell within the ages of 29-39 years, and 29.9% were at the age bracket of 40-50 years, while only 8.2% of them were 50 and above. Their marital status showed 34.6% of the respondents were single, while 65.4% of them were married. In addition, 4.6% of the respondents had SSCE academic qualification, 2.6% have OND/NCE/ Pre-degree diploma, 42.0% had First Degree and HND certificates, while 50.7% of them have Post-Graduate qualifications. A higher percentage, (58.3%) were non teaching staff, while the remaining 41.7% were teaching staff members.

**Research Question 1:** To what extent are sedentary workers in Universities in South-East Nigeria exposed to health risk communication on bad cholesterol build up?

In other to answer this research question the researchers employed tables 2 and 3

**Table 2**
**Respondents' Exposure to Health Risk Communication on Bad Cholesterol Build-Up**

| Exposure | Frequency | Percentage |
|---|---|---|
| Yes | 609 | 100% |
| No | 0 | 0% |
| **Total** | **609** | **100%** |

Table 2 shows that all the respondents said they had encountered messages related to health risk of bad cholesterol build-up. In other words, there was 100% exposure among the respondents. This reflects the finding of Nnamdi (2015) showing high exposure to messages on bad cholesterol build-up among Nigerians. Generally, literature indicates that over the years there has been a good number of campaigns on health risk of bad cholesterol build-up (Awosan & Ibrahim, 2013; Awotiedebe et al., 2014; Ihesie, 2015; Adekunle, 2016; Diwe et al., 2016); a possible factor in the high exposure recorded among the respondents here.

**Table 3**
**Respondents' Circumstance of Exposure to**
**Health Risk Communication on Bad Cholesterol Build-Up**

| Circumstance | Frequency | Percentage |
|---|---|---|
| By conscious effort | 151 | 24.8% |
| By chance | 231 | 37.9% |
| By both | 227 | 37.3% |
| **Total** | **609** | **100%** |

Table 3 shows that 24.8% of the respondents got exposed to health risk communication on bad cholesterol build-up mainly through conscious effort, 37.9% got exposed to it mainly by chance, while 37.3% encountered the communication both by conscious effort and by chance. Thus, overall, about 62% consciously sought for messages on bad cholesterol build-up (even though some among this number, at the same time, also got exposed to the message by chance). This arguably suggests that the respondents

Based on the foregoing, it is evident that a significant number of the university workers were significantly exposed to health risk communication on bad cholesterol build-up.

**Research Question Two:** To what extent are sedentary workers in Universities in South-East Nigeria aware of health risk communication on bad cholesterol build up? Table 4 and 5 addressed the above research question.

**Table 4**

**Respondents' Awareness of Relationship between Sedentary Work and Risk of Bad Cholesterol Build-Up**

| | Long hours of sitting expose one to the risk of bad cholesterol build-up? | People who do sedentary jobs such as mine are at the risk of bad cholesterol build-up? | People who do sedentary jobs such as mine are at the risk of suffering heart attack due to bad cholesterol build-up? | People who do sedentary jobs such as mine are at the risk of suffering stroke due to bad cholesterol build-up? |
|---|---|---|---|---|
| Yes | 82.8%<br>N = 504 | 71.4%<br>N = 435 | 75.7%<br>N = 461 | 73.9%<br>N = 450 |
| No | 17.2%<br>N = 105 | 28.6%<br>N = 174 | 24.3%<br>N = 148 | 26.1%<br>N = 159 |
| **Total** | **100%**<br>**N = 609** | **100%**<br>**N = 609** | **100%**<br>**N = 609** | **100%**<br>**N = 609** |

Table 4 shows the respondents' awareness of the relationship between sedentary work and risk of bad cholesterol build-up. Data in the table indicate that 82.8% were aware that long hours of sitting exposes one to the risk of bad cholesterol build-up, 71.4% were aware that people who do sedentary jobs such as theirs are at risk of bad cholesterol build-up, 75.7% knew that people who do sedentary jobs such as theirs are at risk of suffering heart attack due to bad cholesterol build-up, while 73.9% were aware that such sedentary workers risk suffering stroke as a result of bad cholesterol build-up. Hence, it could be stated that a good majority of the respondents were aware that sedentary work increases one's susceptibility to bad cholesterol build-up. This tends to agree with findings in some previous studies showing high awareness and knowledge of risk factors for bad cholesterol build-up among members of the public (Mohammed, 2012; Awosan *et al.,* 2013; Aderigbe *et al.,* 2017; Adeotun *et al.,* 2018).

**Table 5**
**Respondents' Extent of Awareness of Relationship between Sedentary Work and Risk of Bad Cholesterol Build-Up**

| Extent of Awareness | Frequency | Percentage |
|---|---|---|
| To a large extent | 194 | 31.9% |
| To some extent | 275 | 45.2% |
| To a little extent | 134 | 22.0% |
| Never | 6 | 1.0% |
| **Total** | **609** | **100%** |

Table 14 presents in cumulative terms the respondents' awareness of the relationship between sedentary work and risk of bad cholesterol build-up. Data in the table show that 31.9% were aware to a large extent, 45.2% were aware to some extent, 22% were aware to a little extent, while 1% were not aware. Thus, majority (77%) were aware of this relationship either to a large or some extent, meaning that only a minority (23%) had little or no awareness. These data reflect the data in Table 13 as well as results of previous studies on people's awareness and knowledge of risk factors for bad cholesterol build-up (Mohammed, 2012; Aderigbe *et al.,* 2017; Adeotun *et al*., 2018).

Based on the data extracted above, it was evident that sedentary workers in Universities in South East Nigeria were also aware of the health risk of bad cholesterol build-up.

**Research Question 3**: To what extent do sedentary workers in South-East Nigeria comply with precautionary measures to reduce the risk of bad cholesterol? Table 6 provided answer for the third research question

**Table 6**

**Compliance with Precautionary Measures to Reduce Risk of Bad Cholesterol Build-Up**

| | Do you practise exercise to reduce your risk of bad cholesterol build-up? | Do you avoid intake of fatty foods to reduce your risk of bad cholesterol build-up? | Do you avoid intake of junk foods to reduce your risk of bad cholesterol build-up? | Do you avoid intake of red meat to reduce your risk of bad cholesterol build-up? | Do you avoid smoking to reduce your risk of bad cholesterol build-up? | Do you go for low salt diets and consume lots of fruits and vegetables to reduce your risk of bad cholesterol build-up? |
|---|---|---|---|---|---|---|
| To a large extent | 17.6% N = 107 | 28.2% N = 172 | 32.5% N = 198 | 27.3% N = 166 | 73.4% N = 447 | 30.4% N = 185 |
| To some extent | 65.7% N = 400 | 40.2% N = 245 | 40.9% N = 249 | 34.5% N = 210 | 16.1% N = 98 | 48.9% N = 298 |
| To a little extent | 12.8% N = 78 | 24.1% N = 147 | 22.3% N = 136 | 30.5% N = 186 | 5.3% N = 32 | 14.3% N = 87 |
| Never | 3.9% N = 24 | 7.4% N = 45 | 4.3% N = 26 | 7.7% N = 27 | 5.3% N = 32 | 6.4% N = 39 |
| **Total** | **100% N = 609** | **100% N = 609** | **100% N = 609** | **100% N = 609** | **100% N = 609** | **100% N = 609** |

Table 19 shows respondents' practice of precautionary measures to reduce risk of bad cholesterol build-up. Data in the table indicate that 17.6%, to a large extent, practised physical exercise to reduce risk of bad cholesterol build-up, 65.7% practised this to some extent, 12.8% did it to a little extent, while 3.9% never did this at all. Similarly, 28.2%, to a large extent, avoided intake of fatty foods to reduce risk of bad cholesterol build-up, 40.2% avoided this to some extent, 24.1% avoided it to a little extent, while 7.4% never avoided such. Further, 32.5% of the respondents, to a large extent, avoided intake of junk foods to reduce risk of bad cholesterol build-up, 40.9% avoided this to some extent; 22.3% avoided it to a little extent, while 4.3% never did so. Also, 27.3%, to a large extent, avoided intake of red meat to reduce risk of bad cholesterol build-up, 34.5% avoided it to some extent; 30.5% avoided this to a little extent, while 7.7% never avoided it at all. In the same vein, 73.4% of the respondents, to a large extent, avoided smoking to reduce risk of bad cholesterol build-up, 16.1% avoided it to some extent, 5.3% avoided it to a little extent, while another 5.3% never avoided it. Lastly, 30.4% of the respondents, to a large extent, went for low salt diets and consumed lots of fruits and vegetables to reduce risk of bad cholesterol build-up, 48.9% did this to some extent, and 14.3% did it to a little extent, while 6.4% never did this. The implication of these figures is that majority of the respondents practised precautionary measures against bad cholesterol build-up either to a large extent or to some extent. Stated differently, only a minority practised such measure to a little extent or failed to practise them at all. This tends to contradict findings in some previous studies showing that high awareness and knowledge did not translate to practice of precautionary measures against bad cholesterol build-up (Nnamdi, 2015; Aderigbe *et al.*, 2017).

The data in table six shows that only a minority complied with measures to reduce risk of bad cholesterol. In other words the answer to the thirds research question is that sedentary workers in universities in South-East Nigeria did not really comply with precautionary measures to reduce the risk of bad cholesterol?

**Discussion of Findings**

The study came up with three findings, which are discussed in this section. The first finding demonstrated that a significant number of the university workers were significantly exposed to health risk communication on bad cholesterol build-up. This finding reflects the results of previous studies (such as Adekunle, 2016; Diwe et al., 2016; Nnamdi, 2015) which revealed high exposure to bad cholesterol build-up messages among

Nigerians. The implication of the above finding therefore is that workers in Nigerian universities get exposed to messages that harp on cholesterol build-up.

The second finding showed however that sedentary workers in Universities in South East Nigeria were also aware of messages on the health risk of bad cholesterol build-up. Interestingly, similar studies, Adum & Nwosu, 2021; Abugu & Dunu, 2020; Mohammed, 2012) also had similar findings. Abugu and Dunu, who carried out investigation with bankers, who primarily are sedentary workers, showed that these bankers were significantly aware of the messages that emphasized on the importance to adhere to campaign messages that gave emphasis to the importance of taking precautionary measures to reduce the risk of high cholesterol.

The third finding however demonstrated that sedentary workers in universities in South-East Nigeria did not really comply with precautionary measures to reduce the risk of bad cholesterol? It might be important at this point to note that most times, just like Okoro et.al argue, "The fact that people were exposed, became aware of health message does not really mean that same people will practice or comply with those messages" They authors therefore argue that there are sometimes, some intervening variables that might affect the compliance with messages. Just like the present study, other studies (Nwosu & Adum 2021; Nnamdi, 2012; Abugu, 2020) also had similar findings where they noted that most of the respondents who received health messages on bad cholesterol build up did not actually comply with the contents of these messages.

**Conclusion and Recommendation**

The result of this study clearly indicates that sedentary workers in universities were significantly exposed to health risk communication on bad cholesterol. It also showed that a good number of them were aware of messages on the health risk of bad cholesterol. Finally, the study showed that sedentary workers in universities in South-East Nigeria did not really comply with precautionary measures to reduce the risk of bad cholesterol. From the foregoing, it becomes imperative to extrapolate that when people are exposed to messages that will help them live well, but decide to downplay the importance of such messages, there usually might be reason for failing to comply with such messages. It therefore becomes crucial for health managers to look deeply into factors that might affect the ability of the audience to comply with messages that they receive.

It is therefore based on the findings of this study that the following recommendations become imperative:

1. Given the inadequate level of adoption of precautionary measures as discovered by this study, bad cholesterol communication among university workers in South-East Nigeria should emphasise adoption of such measures as well as highlight the consequences of failing to do so. This may help persuade the audience to embrace and sustain such health action.

2. Universities in South-East Nigeria should leverage the Internet and social media for continuous bad cholesterol campaign among their staff. This is given the finding that these two channels played a leading role in the exposure of these workers to such communication. Hence, social media platforms including WhatsApp groups on campuses should be vigorously employed for such campaign in order to tap into this strength

3. Campaign on bad cholesterol build-up among university workers in South-East Nigeria should include messages aimed at emphasizing vulnerability as well as ease (achievability) of precautionary measures. This is to help increase perception of susceptibility and decrease perception of barriers among the audience as a way of better motivating them to take desirable health actions.
4. Health messages on bad cholesterol build-up and its health implication should be developed by health campaign managers in a very clear manner and lay emphasis on adoption of measures to proactively manage the situation as well as highlight consequences for failing to do so.

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