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Perception of Lagos state based tertiary institution students towards the hidden health dangers of mobile internet devices

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Abstract

Mobile devices and internet have become the integral part of our everyday life. These devices are being used for many purposes such as for internet and telecommunication. The purpose of this study is to investigate the perception of tertiary institution students towards the hidden health dangers of mobile devices and internet usage. These devices emit harmful radiations which cause diseases like: male infertility, brain tumor, hearing impairment, fetus, and effect on eyes. This study investigated the perception of students towards the reality of some major diseases, such as, brain tumor, male infertility cancer, visual and hearing impairment and so on through wrong usage of mobile devices and internet. The survey was conducted on students from the Computer Science departments of the state-owned tertiary institutions in Lagos, Nigeria. The instrument used was validated at a reliability co-efficient value of 0.77. The result collected revealed that most students are either ignorant or non-challant about the imminent danger of the wrong usage of mobile internet devices to the human health. Recommendations suggested concerted effort to create an awareness to avert the latent danger posed to the Nigerian population through wrong usage of mobile internet devices in order to maintain healthy society

Keywords: Perception, health dangers, mobile devices/internet, usage, gender. Male infertility

Introduction

Mobile devices and internet technology has revolutionised the telecommunication scenario in the world and more especially in the developing nations. Due to its several advantages especially in the increasing number of application benefits, cell phone technology has grown exponentially in the last two decades. Features ranging from chatting with relatives, school mates, and colleagues and so on from home or any place, watching real-time events, listening to radio and music, paying for goods, and services, academic research, reading books and online news, monitoring and controlling processes and many more using the mobile devices and internet. The Nigerian Communication Commission as at June, 2017, estimated data of mobile devices and internet users to 91,598,757, this tremendous increase may be due to the proliferation, price reduction and portability of the mobile devices. Every home is recording at least one cell phone per person; kids in primary and secondary schools are allowed to have their phones with them especially in some developing countries such as Nigeria because of security reasons. The wireless devices have therefore become the integral part of our everyday life.

During the last decade, several studies have tried to delimit risk factors associated with problematic mobile internet device use. Mobile internet device use electromagnetic radiation in the microwave range, which some believe may be harmful to human health. A large body of research exists, both epidemiological and experimental, in non-human animals and in humans, of which the majority shows no definite causative relationship between exposure to mobile internet device and harmful biological effects in humans. This is often paraphrased simply as the balance of evidence showing no harm to humans from mobile phones, although a significant number of individual studies do suggest such a relationship, or are inconclusive (Ravichandran, Shanthi & Vaidyanathan 2009) [24].

Mobile devices use the electromagnetic radiation to receive and send the data through the air, whether it is sound data or network data. These devices emit harmful radiations which affect

the human body because such radiations are present everywhere that we can neither feel nor see. These radiations penetrate our body and have effects on the cell's DNA (The DNA is genetic material of cell that is sensitive to ionizing radiation). With the ionizing radiation the DNA of cell can be changed. (Setubal & Meidasnis, 1997) ^[26]. The several types of radiation are being used for connecting the wireless devices and each type of radiation has different wavelength and frequency, the frequency of radiation is from 3 kHz to 300 GHz.

Literature Review

Numerous mobile wireless devices which are hand free, wireless router, tablet pc, cell phone tower, mobile phone, bluetooth device, laptop connected with the wireless router and audio player. These wireless devices emit the harmful radiations which cause many diseases i.e., Male Infertility, miscarriage risk, Brain Tumor, Ear Hearing Impairment, effect on fetus, increasing risk of cancer, Parkinson's disease, Alzheimer's disease, Heart disease, Asthma, Insomnia, Leukemia, High Blood Pressure, Birth Defects, Rheumatoid Arthritis, Immune system (Sage & Carpenter, 2009) ^[25]. Radiations are also cause of some symptoms which are fatigue, sleep disturbance, headache and so on.

Nowadays, mobile devices are kept very close to groin area by human, like near the testis such as trouser pocket, chest pocket close to the heart and breast and ignorantly in the brassier and under the pillow while sleeping (Kibona, 2013) ^[16]. Doing these electromagnetic waves have a harmful effect due to wrong usage of mobile devices which makes users prone to some illness.

Diseases Emanating From Wrong Usage of Mobile Device

Male infertility

Reproduction is a natural experience for couples. However, it is very difficult to plan for the baby. Basically the infertility is a common phenomenon in the world due to different reasons. The male infertility problem occurs due to the sperm production (sperm production in low number) or the transport process of sperm (Dohle, 2010) ^[7]. The infertility problems are sperm motility, sperm count, sperm morphology, functions of sperm, impaired leydig cell, sertoli cell, abnormality of sperms, to stop delivery of sperm, chronic wellness problem. (Hamada, Singh & Agarwal, (2011) ^[11]

Brain tumor

It is a mass of tissue that is abnormal or occurs when the body cells die or are replaced with other cells and other tumors. (Kircher, de la Zerda, Jokerst, Zavaleta & Kempen, 2012) ^[18] There are two types of brain tumor which are malignant tumor and benign tumor caused by electromagnetic radiation. (Janic, Mendizabal, Llamazares, Rossell & Gonzalez 2010) ^[22]

Ear impairment

Hearing problem usually develops according to the age and loud noise. There are different causes of hearing loss that creates difficulty in hearing and listening clearly to audio messages. The cause of hearing loss is listening to music with high volume. (Rana, Chou, Kanhere & Bulusu 2010) ^[23].

the Interphone Study assesses whether exposure to electromagnetic radiation or microwave radiation from mobile phones is associated with a risk of cancer. Priority was given to epidemiological studies of the relationship between the use of mobile devices and the incidence of:

- brain tumours;
- salivary gland tumours, acoustic neuromas and other head and neck tumours; and
- leukemia and lymphomas.

The effect of mobile phone radiation on human health is the subject of recent interest and study, as a result of the enormous increase in mobile phone usage throughout the world (Wiki, 2014) ^[36]. Mobile phones use electromagnetic radiation in the microwave range. Studies by Koprivica (2013) ^[17] opined that as a result of dense installations of public mobile base station, additional electromagnetic radiation occurs in the living environment. Kovach (2007) ^[19] observed that exposure to electromagnetic radiation is growing and becoming a serious health threat. He also pointed out the huge public health crisis looming from one particular threat of electromagnetic radiation from cellular phones, both the radiation from the handsets and from the tower-based antennas carrying the signals which studies have linked to development of brain tumours, genetic damage, and other exposure-related conditions (Kovach, 2007) ^[19]. Part of the radio waves emitted by mobile device is absorbed by the body (Wiki, 2014) ^[36].

In Spain, Oberfeld (2004) ^[20] study found out a significant ill-health effects among those living in the vicinity of two GSM mobile phone base stations. He found out that depressive tendency, fatigue, sleeping disorder, difficulty in concentration and cardiovascular problems were the strongest five association. The studies pointed out the latent and manifest danger of mobile internet usage, the pertinent issue prompting this research work is hinged on some assumptions. Most illiterate Nigerian users are unaware of these health hazards. However, even students that are computer literate that are aware of these danger non-challantly put their mobile internet devices in chest and trouser pockets. Worryingly, with these ignorance, carefree and non-challant attitudes, this study perceives a lot of health challenges in some decades to orchestrate by wrong usage of mobile internet devices in Nigeria. Creating awareness on this latent health dangers posed by wrong usage of mobile internet becomes imminent which is the mainstay of this study.

Theoretical Framework

This study is theoretically framed on Reasoned Action Theory. The theory of reasoned action was developed by Martin Fishbein and Icek Ajzen in 1975 and 1980 in an attempt to expand and redefine Expectancy Value Models (which state that behaviour is the product of expectancy and goals). The theory opined that a person's relationship between attitudes and behaviours within human action. This theory is used to predict how individuals will behave based on their pre-existing attitude and behavioural intentions (Ajzen, 1975) ^[3]. The theory defines link between beliefs, attitudes, norms intentions and behaviour of an individual. This implies that a person's attitude towards a behavior is determined by his belief on the consequence of his behavior. These behaviours and intentions are determined by subjective norms that are themselves determined by normative beliefs of an individual and by his motivation to

comply to norms. The analysis of this theory shows the prediction of choice made by individual when facing several alternatives (Fishbein & Ajzen 1977). This theory implies that wrong usage of mobile devices and internet is caused by wrong choice of Nigerian attitude towards safe use of mobile devices and internet. Most users are directly or indirectly aware of the latent health hazards mobile devices and warnings such as:

- Avoid carrying mobile internet devices on your body such as pocket or bra.
- Avoid holding any mobile phone against your body when in use that is against your head.
- Use mobile phones on loud speaker or with an air “tube headset”.
- Put your mobile devices on “airplane mode” when not in use.
- Avoid the use of mobile device and internet in cars trains or elevators
- Keep mobile devices away from you when you are asleep (out of bedroom)(Davis, 2016)

However, ignorance, carefree and non-challant attitude and behaviour among phone users in Nigeria may constitute the bulk of the health hazard that may arise from wrong usage of mobile device and internet. The reasoned theory emphasized adherence to safe usage or wrong usage of mobile internet devices hinged on the choice of the usages. More importantly, even the elites that are aware of these health hazards non-challantly use mobile internet devices and wrongly. There have been outcry and fears expressed recently about the possible dangers emanating from wrong usage of mobile devices and associated health hazards such as cancer, miscarriages, birth defects, brain tumor, headache, fatigue, dizzy spells, memory loss and death during thunder storm. Since human activities began to add radiation to the environment, people have become concerned about the effects of it on health. Radiation may enter the body directly through the skin, but it is usually inhaled or ingested. Prolonged exposure produces radiation sickness in some people which occur in stages. The argument now beckons, what is the extent of this perceived health hazards on tertiary institution students? Who is more prone to health hazards between the genders? What precautions are to be put in place to manage the challenges associated with wrong usage of mobile devices? Hence this study seeks to examine the perception of tertiary institution students towards the hidden health dangers of mobile devices and internet usage.

Objective of the study

1. To examine the perception of tertiary institution students on how wrong usage of mobile devices causes health hazards like cancer, miscarriages, birth defects, brain tumor, headache, fatigue, dizzy spells and memory loss among tertiary institution students in Lagos state.
2. To investigate gender differential on tertiary institution students towards the hidden health hazards of wrong usage of mobile internet devices.

Research Hypotheses

H01: There is no significant causative factor like cancer, miscarriages, birth defects, brain tumor, headache, fatigue,

dizzy spells and memory loss and the perception of tertiary institution students on wrong usage of mobile devices
H02: There is no significant difference between the male and female students on wrong usage of mobile devices and internet.

Significance of the study

The study will evolve a change in attitude among tertiary institution students and Nigerians as regards ignorance or non-challant attitude about the imminent danger of the wrong usage of mobile internet devices to the human health. The study will be of importance to teachers in that it will give them better information and more result oriented view point as to the likely hazards that are associated with wrong usage of mobile internet devices.

To students, the outcome of this work will guide them in taking an informed decision as to the appropriate way to handle and use mobile internet devices because of the numerous health hazards identified with it while maximizing the benefits of the mobile internet devices optimally.

Researchers based on the output of this work will provide a port-folio with respect to an addition to the wealth of knowledge on IT related device usage and its possible impact on learners.

Methodology

This study used a descriptive survey research design because the design seeks to describe all variable relating to the study. The basis for adoption of a descriptive design is that no variable was manipulated rather a simple studying of the existing variables as they occur. A descriptive design seeks to establish opinion on issue of the day, attitude towards more basic issues and facts about people interviewed or observed. It identifies present condition, prevailing needs as well as provides information on which to base sound decision (Osuala, 2001) ^[21].

Population

The population for the study was all Tertiary Institution students in Lagos state. A sample of one hundred and forty students were used for this study from four institutions of Lagos State University (LASU), Adeniran Ogunsanya College of Education (AOCOED), Yaba College of Technology (Yaba-Tech) and Federal College of Education (FCE, Akoka) LAGOS.

Sample and Sampling technique

Samples of 140 students were used in the course of this study. A Stratified sampling technique was adopted whereby students of the department of Computer Science from Lagos State University (LASU), selected (40 respondents), Federal College of Education (FCE), Akoka selected (40 respondents), Yaba College of Technology selected (40 respondents) and Adeniran Ogunsanya College of Education (AOCOED) selected (20 respondents) from each institution irrespective of their levels so long the student have access to a mobile phone. However, after the stratification, a simple random sampling method was then employed to select these students. AOCOED got the lowest because the department records one of the least in the college while in other sampled institutions the enrollment rate was on the high side.

Table 1: Distribution of sample on the basis of gender and Institutions.

Gender	AOCOED	FCE TECH (AKOKA)	LASU	YABA TECH	
Male	12	24	22	21	79
Female	8	16	18	19	61
Total	20	40	40	40	140

Research Instrument

A self-constructed questionnaire with fifteen items tagged, “Tertiary Institution Students Perception on Wrong Usage of Mobile Device and Internet” were used to generate data for this study. After meeting face and content validity by experts in the field of Test, Measurement and Evaluation, twenty students distinct from the sample of the study but have all the characteristics with those of the main study was used as pilot study. After data generation, Chronback Alfa of reliability was used to determine the stability and consistency of items in the instrument as a reliability co-efficient value of 0.77 was derived.

Method of Data Analysis

Charts were used to analyse and test the two formulated hypotheses in this study due to the variation in the sign posts used in the course of formulating the hypotheses.

Presentation of results: Testing of Hypothesis and Interpretations

Ho1: There is no significant causative factor like cancer, miscarriages, birth defects, brain tumor, headache, fatigue, dizzy spells and perception of tertiary institution students on wrong usage of mobile devices and internet.

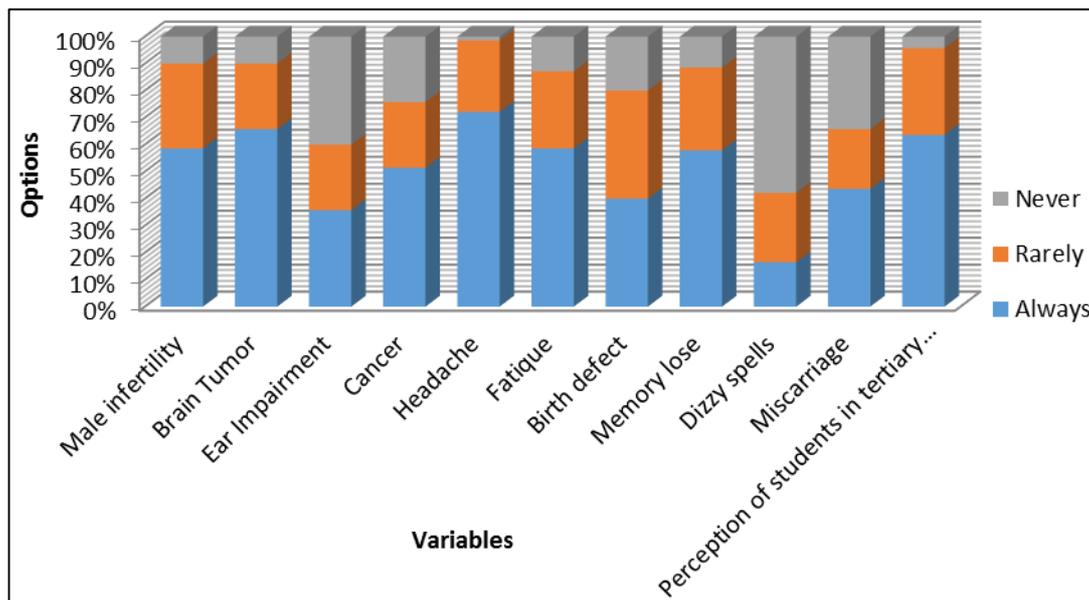


Fig 1: Showing significant causative factor like cancer miscarriages, birth defects, brain tumor, headache, fatigue, dizzy spells and perception of tertiary institution students on wrong usage of mobile devices

Interpretation

From figure 1, it unveils the various causative factor like cancer, miscarriages, birth defects, brain tumor, headache, fatigue, dizzy spells and perception of tertiary institution students on wrong usage of mobile devices. On excessive usage of the device that it can cause infertility in male, 82(58.6%) respondents are always of the view, 44 respondents representing (31.4%) said that it, rarely causes it while 14 respondents representing (10%) claimed it can never be possible. On excessive usage of the device that it can cause brain tumor, 92 respondents representing (65.7%) agrees that it is always possible, 34 respondents representing (24.3%) said that it rarely causes it while 14 respondents representing (10%) claimed it can never be possible. Though on the statement that excessive usage of mobile phone device can cause ear impairment, 50 respondents representing (35.7%) agrees that it is always possible, 34 respondents representing (24.3%) said that it rarely causes it while 56 respondents representing (40%) claimed it can never be possible. Pertinently on the statement that excessive usage of mobile phone device can cause cancer, 72 respondents representing

(51.4%) agrees that it is always possible, 34 respondents representing (24.3%) said that it rarely causes it while 34 respondents representing (24.3%) claimed it can never be possible. Also on the statement that excessive usage of mobile phone device can cause headache, 101 respondents representing (72.2%) agrees that it is always possible, 37 respondents representing (26.4%) said that it rarely causes it while 2 respondents representing (1.4%) claimed it can never be possible. Although on the statement that excessive usage of mobile phone device can cause fatigue, 82 respondents representing (58.6%) agrees that it is always possible, 40 respondents representing (28.6%) said that it rarely causes it while 18 respondents representing (12.8%) claimed it can never be possible. However on the statement that excessive usage of mobile phone device can cause birth defect, 56 respondents representing (40%) agrees that it is always possible, 56 respondents representing (40%) said that it rarely causes it while 28 respondents representing (20%) claimed that such health implication on the usage of the device is laughable. Moreso, on the statement that excessive usage of mobile phone device can cause memory loss, 81 respondents

representing (57.9%) agrees that it is always possible, 43 respondents representing (30.7%) said that it rarely causes it while 16 respondents representing (11.4%) claimed that such health implications on the usage of the device is not possible.

As regards excessive usage of mobile phone device causing illness like dizziness spells, most of the students refuted it as only 23 respondents representing (16.4%) agrees that it is always possible, 36 respondents representing (25.7%) said that it rarely causes it while 81 respondents representing (57.9%) claimed that such healthy implication on the usage of the device is not possible. Looking at the statement that excessive usage of mobile phone device can cause miscarriage, many students were caught in-between as 61 respondents representing (43.6%) agrees that it is always possible, 31 respondents representing (22.1%) said that it rarely causes it while 48 respondents representing (34.3%) claimed that such healthy implication on the usage of the device is not possible. On perception of students in tertiary

institutions on wrong usage of mobile devices, generically, 89 respondents representing (63.6%) have a positive perception always, 45 respondents representing (32.1%) have a neutral view point while the remaining 6 respondents representing (4.3%) have a total negative perception vehemently. Tindell & Bohlander (2011) [29] asserted that talking on a mobile phone for as little as 500 to 1000 minutes per month can increase the probability of brain cancer. Not only that, it can also lead to difficulty in sleep, difficulty in concentration, fatigue, headache and infertility. There are also chances of Alzheimer's disease, leukemia, ear effects and blurring of vision among regular mobile phone users. Intense use of mobile phones may cause harm to the users' health including his/her other psychological wellbeing.

Ho₂: There is no significant difference between male and female students on wrong usage of mobile devices and internet.

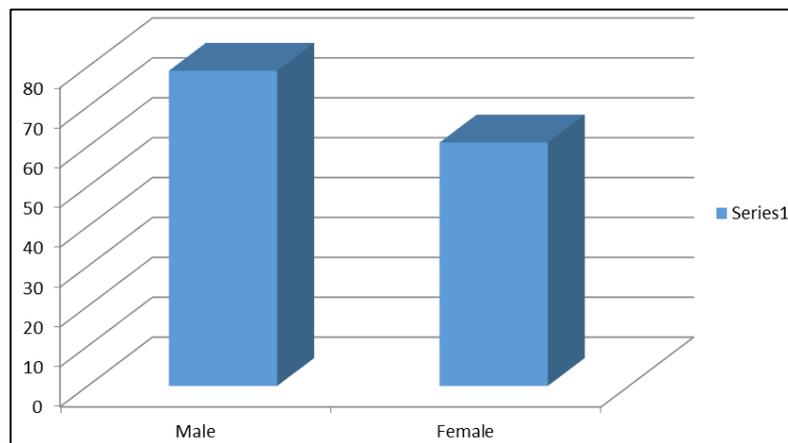


Fig 2: Showing difference between male and female on wrong usage of mobile devices and internet

Interpretation.

From figure 2, it shows that 79 respondents were male students with mean value of 54.13 and standard deviation value of 7.64 while 61 respondents were female students with mean value of 48.79 and standard deviation value of 5.91 respectively.

Discussion of Findings

Hypothesis one, have it that there is a significant negative impact of causative factors like cancer, miscarriages, birth defects, brain tumor, headache, fatigue, dizzy spells and memory loss on student's Performance. This is in conformity with the works of Whelan (2000) [34] and IHEE (2001) [13] who maintained that incessant use of mobile device and internet can cause brain tumor, fatigue, miscarriages, brain loss, and cancer among others. Due to the high electro-magnetic components that have adverse effect on users, indiscriminate exposure of this device to unregulated environment, body temperature and heat have the tendency of exposing users to various hazards. These hazards though harmful and deadly to users have the tendency of causing serious damage if not well handled. This device is surrounded with acidic components and other chemical related solvents that aid connectivity. Scientifically, they also paralyze sensitive human parts that are exposed to the hardware device continuously over time. Dahunsi (2012) stressed that through the use of mobile

internet device causes cancer of the skin which occurs due to exposure of the skin to the radiation from the phone, heat emitting from the device can cause brain damage and memory loss. Most times too, accidents occur when these mobile internet devices are used while driving, sudden reception of bad news near dangerous spots among others. Also exposure of phones to naked light, near petrol stations among others.

According to Vasudev (2012) [31] constant use of mobile device and internet can lead to 44.4% decrease in fertility level, 30% sperm damage and effect was 36%. The effect to the heart's function was 50.0% according to Vasudev *et al.* (2012) [31] and in current study the effects was 46%; that is an agreement with current study. 32.3% effects on brain tumor was found by Al-Muhayawi *et al.* (2012) [4] according to the world health organization report, the mobile device and internet radiation has 40% effect on brain tumor and the effect on brain tumor was 84%. In addition it was discovered that the effect of mobile device and internet on Alzheimer's disease (Divan, 2008) [6]. The diseases due to the electromagnetic field are immune system damage, Alzheimer's disease, Parkinson's disease and heart problems. Divan *et al.* (2008) [6] found the effect of mobile device and internet radiation on prenatal and postnatal conditions, it was examined that the effect on unborn baby when mother use the mobile device and internet and laptop (when laptop connected with WiFi), these radiations are bad

for unborn baby's brain development and also mobile device and internet radiation affects our brain (Uddin & Ferdous, 2010) ^[30]

Given the gross inequality among men and women in Nigeria, various stakeholders have spent countless hours and contributed tremendous effort to determine the best route towards reducing gender disparity. Among the various actors are Information Communication technologies for development (ICT4D), Community which focuses on using ICTs for furthering political and social development in developing countries. The millennium Development Goals (MDGs) which focuses on elimination of gender inequality in all spheres. In hypothesis two, which states that there is no significant difference between male and female students on wrong usage of mobile devices and internet.

A number of studies corroborated these findings by seeking to understand gender similarities and differences in access to and usage of mobile devices. It was observed that men and women adopt the use of mobile devices differently (Gefen & Straub, 1997 ^[10]; Venkatesh & Morri, 2000) ^[32]. Men's decisions to use mobile device are more strongly influenced by their perception of usefulness, while women's decisions is are based more on perception of the technology use of ease. Further, men and women may view the same mode of communication differently. Abati (2003^[11] and Fagbure (2004) opined that female students most especially are glued to the use of cell phones compared to their male counterparts. These views noted that because of the increase in the usage of cell phones by female students they are mostly prone to related health hazards usually associated with the usage of mobile applications. The findings of Anunobi & Mbagwu (2009) on Gender Discrepancy in Internet Use in Nigeria, reported that females visit the internet less frequently than the male, but stay longer hours browsing compared to the male. This difference may be attributed to technological bias, traditionally imposed on the female gender, due to domestic pressure and some cultural barriers.

However, use of mobile internet devices has given birth to different patterns of communication and one such variation is noticed in gendered usage. Literature reveals that there are significant differences in girls and boys using mobile internet devices. While girls are more likely to use them in social contexts, boys use them for matters of doing things. Girls are keener to use for safety purpose than boys are. While girls are more inclined towards the look of the mobile internet devices, boys are more interested in functionality. Girls communicate more intensely than boys do. Importantly, girls are more likely to bully others than boys, and girls are victims of harassment/bullying via mobile phones more often than boys are. Teenage girls communicate more intensely over cell phones than boys do. Earlier studies demonstrate that for teenage girls (beginning at a certain age), mobile internet devices such as the telephone, e-mails and chat groups are more important to them than they are to teenage boys (Suoninen, 2001) ^[28]. They exchange, send, and receive more information and details through SMS's as do boys of the same age group (Kasesniemi & Rautiainen 2002) ^[15]. Furthermore, teenage girls carry out more SMS conversations and on average employ approximately 160 characters in a short message (Höflich & Rössler 2000) ^[13].

Teenage girls communicate in a more emotional manner over cell phones than boys do. Preliminary evidence

indicate that young girls are more sensitive to personal and third person sensitivities and feelings, while young boys write in a more matter-of-fact manner. Teenage boys concern themselves more with mobile internet devices communication than girls do. In accordance with gender-specific roles, many teenage boys are more interested in technology than are teenage girls (Lemish, Liebes & Seidmann 2001) ^[14]. Another study demonstrated accordingly that mobile phone brands and technical functions of the phones are more important for teenage boys than for teenage girls, who pay more attention to color and design (Skog, 2002) ^[27]. This pattern the frequency of usage and at different times makes both gender prone to misuse and health hazard of mobile device and internet.

Conclusion

It is concluded that the use of wireless devices have been increased throughout the world, these devices have become the part of our live, but Nigerians are unaware, carefree and non-challant about the effects on human health while using these devices. All wireless devices emit radiation in the form of electromagnetic waves. This study observed that the mobile phone is more dangerous for our health and misuse should be avoided. Medically, wireless devices such as cell phones, laptop, wireless router, wireless headphone, cell phone tower, Bluetooth devices and tablet PC the is cause of the disease of brain tumor, male infertility, heart disease, effect on fetus, hearing impairment, eye problems, immune system, leukemia, Alzheimer's disease and Parkinson's disease. It is suggested that one should avoid wrong use of wireless mobile internet devices while maximizing the benefits of the mobile internet devices optimally.

Recommendations

- According to survey, the wireless devices emit radiations that are harmful to human health, so there are some recommendations that the study suggested on access and usage of mobile device and internet:
- Don't put the mobile device in a bra, shirt and breast pocket.
- Don't use mobile device and internet for long-term which is harmful to health because doctors suggesting the use of mobile device and internet for one hour in a day which can cause brain tumor within 10 years.
- Avoid the long time conversation, use head phone when you have to talk for long call.
- Avoid using the wireless gadget like cell phone, laptop, tablet pc, wireless keyboard and mouse so on.
- Don't place the laptop on a lap when it is connected to Wi-Fi because it is harmful for sperms and also have effect on the fetus. Especially pregnant women should avoid the use of tablet, PC, laptop and mobile device and internet.
- Don't use wireless devices in schools and colleges because it is harmful for the children and it is suggested that we use the Land-line Phones.
- Each and every one should know about the effects of these wireless radiations on human body. In this regard public awareness programmes may be designed and executed as soon as possible by the concerned authorities.
- Government should take an action on mobile device and internet towers existing in or near populated areas because mobile device and internet towers emit the

harmful radio waves which cause human health problems.

- The installation of towers in the populated area may be banned and if they are already installed, should be removed immediately to save the people from their dangerous effects of radiations.

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