Effects of the Artificial Intelligence of Smartphone Utilisation on the Health Behaviour of Lecturers in Tertiary Institutions in Lagos

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Abstract
Artificial Intelligence was derived from machines used since the 19th Century. Smart phones perform some functions of natural intelligence displayed by humans for fast and easy decision making and problem solving. Utilization of this device emphasized use within the academic settings to solve problems in research, communication and daily living events. This study investigated effects of the artificial intelligence of smart phone utilization on the health behaviour of lecturers in tertiary institutions in Lagos. The study population comprised all lecturers employed in selected universities in Lagos. This cross-sectional survey had 300 lecturers selected through the purposive sampling technique. Data collection applied a modified Smartphone Usage Questionnaire (SpUQ) r=0.76. Data was analysed using descriptive statistics of frequency count and percentages, mean and standard deviation while three hypotheses were tested at 0.05 Alpha level of significance. The result revealed that artificial intelligence of smartphone utilization will have significant effect on knowledge of health applications, eating habits and physical activity level. It revealed that participants had little knowledge of the health implications of smart phone application and varied patterns of health behaviour. The study concluded that the smart phone is convenient for communication and development of positive health behaviour such as healthy eating and drinking habits, physical activity. Recommendations include proper health education of staff to ensure an increase in awareness and utilization of Smartphone health applications rather than using Smartphones for unimportant purposes that will later have side effects on health.

Keywords: Artificial, Intelligence, Utilization, Lecturers, Smartphone

Introduction

The embracement of Smartphones has come with the features of artificial intelligence with various applications without secluding health applications to ensure human inculcate positive health behaviours for healthy living. According to Jindal and Anand (2012), artificial intelligence (AI) have spread wide usage in robotic systems, where it is the recreation of human brain to explore more inventive abilities to make work easier to be accomplished. Basically, the

working of AI robots or AI computers is through sensors or human inputs. The challenge for AI is to work in similar manner as natural intelligence work. Today, in the world of technology, where daily updates are confusing the minds of end users, most frequently using operating system in today's scenario is ANDROID, which is being updated on a daily basis in various play store. It uses different methods and modes of technology and IT to launch its new applications for end users to make their usage easier for which some of them are using Artificial Intelligence methods to make applications of Android more updated.

AI can be used to analyse social media data and discover and suggest behavioural and environmental impacts on health (Bui, 2016). American College of Cardiology (2019) reported that the generality of the people have the knowledge and are aware that mobile technology is with no doubt attractive for multiple purposes, portability, comfort, assess to so many services and information through the usage of applications without leaving behind health applications that is used to improve habits and health behaviours. Spending limitless time in front of Smartphone without proper usage facilitates sedentary behaviours, reduces the time of physical activity, which increases the risk of untimely death, heart disease, diabetes, some types of cancer and musculoskeletal disorders. Smartphone applications and wearable sensors have the potential to help people make healthier lifestyle choices, but scientific evidence of mobile health technologies' effectiveness for reducing risk factors for heart disease and stroke is limited.

According to Mosa, Yoo and Sheets (2012), Smartphone is a new technology that combines mobile communication and computation in a handheld-sized device, facilitating mobile computing at the point of care. There is need for innovative ways to promote physical activity and a healthy lifestyle. One promising development is the use of smartphones during exercise. Use of mobile applications (apps) may be a powerful tool to encourage physical activity and health (Glynn, Hayes, Casey, Glynn, Alvarez-Iglesias & Newell, 2014; Stephens & Allen, 2013). Apps are accessible, have a large reach, and have multiple functionalities, such as interactive possibilities and feedback opportunities. Although more than 17,000 health and fitness apps have been developed and are available for the public (Middelweerd, Mollee, van der Wal, Brug, Te Velde, 2014; West, Hall, Hanson, Barnes, Giraud-Carrier & Barrett, 2012)

Burke et al. (2015) posited the effectiveness of mobile health technologies (Health) for managing weight, increasing physical activity, quitting smoking and

controlling high blood pressure, high cholesterol and diabetes. The American College of Cardiology (2019) further buttresses that people who include mobile technology in a comprehensive lifestyle program in order to manage weight loss, physical activity and smoking cessation were able to accomplish positive changes. They explained that when considering an mHealth weight loss program, healthcare practitioners should look for one that has many of the same elements as successful person-to-person individualized programs administered by healthcare professionals, which emphasize a calorie-controlled diet, physical activity, self-monitoring or recording food intake and physical activity in a paper or digital diary, personalized feedback and social support. Mobile health apps used in combination with a traditional quit-smoking program may help smokers kick the habit.

Apps have a global positive effect on physical activity. The effect of apps on diet and weight is unclear, but the trend is that they improve eating patterns. Activity trackers can increase physical activity (Dallinga, Zwolsman, Dekkers, Baart de la Faille-Deutekom, (2016). Lecturers within the tertiary institutions are engaged with sedentary lifestyles as a result of pre-occupation with series of activities, they tend to sit within the office for longer hours and stand at length, skip meals and also engage in some other poor health behaviours which may predispose them to cardiovascular diseases, musculoskeletal disorder such as low back pain among others. Most of these staffs embraced the usage of artificial intelligence of Smartphone with the opportunities to download various health applications that could help them maintain healthy lifestyles. Inability to utilise these gadgets maximally could have implications on their health. It is therefore important to investigate the effects of artificial intelligence of smartphone utilisation on health behaviours of lecturers in tertiary institutions in Lagos State.

The following hypotheses were tested in this study:

1. Artificial Intelligence of Smartphone Utilisation will not have significant effect on knowledge of health applications of Lecturers in Tertiary Institutions in Lagos State
2. Artificial Intelligence of Smartphone Utilisation will not have significant effect on eating and drinking habits of Lecturers in Tertiary Institutions in Lagos State
3. Artificial Intelligence of Smartphone Utilisation will not have effect on physical activity of Lecturers in Tertiary Institutions in Lagos State

Methodology

Descriptive survey research method was adopted for this study. Population for this study included all Lecturers in selected Universities in Lagos State. The sample comprised three hundred (300) respondents drawn. Two (2) Universities namely University of Lagos, Akoka and Lagos State University, Ojo were drawn using purposive sampling technique out of seven (7) Universities in Lagos State. This technique was used because of the Staff strength in both Universities. Convenience sampling and simple random sampling techniques were used to select the respondents. Convenience sampling was used in order to administer the instrument to respondents who showed willingness while the use of online survey method was used to administer the instrument to respondents which was randomly administered via WhatsApp platform to reach more respondents.

The research instrument for this study was a modified Smartphone Usage Questionnaire (SpUQ). The instrument contained two sections A and B, Section A consisted personal information of the respondents while B sought information on the sub variables of health behaviours selected for the study. Section B contained 16-item questions on health behaviours. There were four (4) item questions on knowledge of health applications which was rated on a a modified four (4) – point modified Likert format of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) while the items on healthy eating and drinking habits, physical activity and weight control were 4-items each rated on a four (4) – point Likert scale of Always, Often, Sometimes and Never.

The research instrument was validated with the assistance of experts in the Department of Human Kinetics and Health Education, University of Lagos, Nigeria, during which necessary corrections, modifications and suggestions were incorporated before the administration of the instrument. Pearson's product moment coefficient was used to ascertain the reliability of the instrument at r = 0.76. The questionnaire was administered by the researcher and two (2) research assistants to the respondents within their work environment and was collected back immediately after filling to avoid loss of questionnaire. Those that have to do with on-line survey were submitted and collated appropriately. The data from this study was subjected to appropriate statistical analysis. Section A was analysed using descriptive statistics of frequency count and percentage while inferential statistics of chi square was used to test the hypotheses at 0.05 level of significance.

Results
Section A: Demographic Data

Data Presentation

Table 1: Analysis of Demographic Data of the Participants

VARIABLE	N	%
Gender		
Male	192	64
Female	108	36
Total	**300**	**100**
Age		
18-27 Years	52	17
28-37 Years	65	22
38-47 Years	108	36
48-57 Years	62	21
58-67 Years	8	3
68 Years and above	5	2
Total	**300**	**100**
Faculty		
Arts	44	15
Basic Medical Science	16	5
Business Administration and Management	52	17
Clinical Sciences	12	4
Dental Science	6	2
Education	68	23
Engineering	11	4
Environmental Sciences	16	5
Pharmacy	5	2
Sciences	22	7
Social Sciences	48	16
Total	**300**	**100**
Employment Status		
Graduate Assistant	28	9
Assistant Lecturer	84	28
Lecturer II	78	26
Lecturer I	54	18
Senior Lecturer	43	14
Associate Professor	7	2
Professor	6	2
Total	**300**	**100**

Table 1 reveals the demographic data of the participants, 192 (64%) male participated in the study and 108 (36%) were females. The highest age range of the respondents is between 38-47 years 108 (36%) while the lowest age range

were 68 years and above 5(2%). Likewise, 68 (23%) which constitute the highest participant were from Faculty of Education while the lowest 5 (2%) of the participants were from Faculty of Pharmacy. This may be as a result of the staff strength in the faculties. The highest number of participants with the employment status of Assistant Lecturers is 84 (28%) while the Lowest were Professors with 6(2%) which may be due to the hierarchy and ability to reach them.

Testing Hypotheses

Hypothesis 1

Artificial intelligence of smartphone utilisation will not have significant effect on knowledge of health applications of Lecturers in tertiary institutions in Lagos State

Table 2: Artificial intelligence of smartphone utilisation and knowledge of health applications

Variables	N	DF	L.S	x-cal	x-tab	Decision
Artificial intelligence of smartphone utilisation and knowledge of health applications	300	9	0.05	27.12	16.92	Ho rejected

P<0.05

From table 2, the calculated value (x-cal) is 27.12 and this is greater than the table valve (x-tab) of 16.92, which informed the rejection of the null hypothesis which states that: Artificial intelligence of smartphone utilisation will not have significant effect on knowledge of health applications of Lecturers in tertiary institutions in Lagos State. Thus, Artificial intelligence of smartphone utilisation will have significant effect on knowledge of health applications.

Hypothesis 2

Artificial intelligence of smartphone utilisation will not have significant effect on eating and drinking habits of Lecturers in tertiary institutions in Lagos State

Table 3: Artificial intelligence of smartphone utilisation and eating and drinking habits

Variables	N	DF	L.S	x-cal	x-tab	Decision
Artificial intelligence of smartphone utilisation and eating and drinking habits	300	9	0.05	18.23	16.92	Ho rejected

P<0.05

From table 3, the calculated value (x-cal) is 18.23 and this is greater than the table valve (x-tab) of 16.92 which informed the rejection of the null hypothesis which states that: Artificial intelligence of smartphone utilisation will not have significant effect on eating and drinking habits of Lecturers in Tertiary Institutions in Lagos State. Thus, Artificial intelligence of smartphone utilisation will have significant effect on eating and drinking habits of Lecturers.

Hypothesis 3

Artificial intelligence of smartphone utilisation will not have effect on physical activity of Lecturers in tertiary institutions in Lagos State.

Table 4: Artificial intelligence of smartphone utilisation and physical activity

Variables	N	DF	L.S	x-cal	x-tab	Decision
Artificial intelligence of smartphone utilisation and physical activity	300	9	0.05	28.58	16.92	Ho rejected

P<0.05

From table 4, the calculated value (x-cal) is 28.58 and this is greater than the table valve (x-tab) of 16.92, which informed the rejection of the null hypothesis which states that: Artificial intelligence of smartphone utilisation will not have effect on physical activity lecturers in tertiary institutions in Lagos State. Thus, Artificial intelligence of smartphone utilisation will not have effect on physical activity of Lecturers.

Discussion of Findings

The analysis of research hypothesis one reflects that Artificial intelligence of smartphone utilisation will have significant effect on knowledge of health applications of Lecturers. Artificial intelligence of smartphone utilisation will not have significant effect on knowledge of health applications of Lecturers is rejected and the alternate is accepted. This is supported by American College of Cardiology (2019) who reported that the generality of the people have the knowledge and are aware that mobile technology is with no doubt attractive for multiple purposes, portability, comfort, assess to so many services and information through the usage of applications without leaving behind health applications that is used to improve habits and health behaviours.

The results of the second hypothesis of this study reveal that Artificial intelligence of smartphone utilisation will have significant effect on eating and drinking habits of Lecturers. The hypothesis two which says that Artificial intelligence of smartphone utilisation will not have significant effect on eating and drinking habits of Lecturers is rejected and the alternate is accepted. This study supports the findings of According to Dallinga, Zwolsman, Dekkers and Baart de la Faille-Deutekom (2016) who reported that Apps have a global positive effect on improving the eating patterns of consumers.

The results of the third hypothesis of this study reveal that Artificial intelligence of smartphone utilisation will have effect on physical activity of Lecturers. The hypothesis three which says that Artificial intelligence of smartphone utilisation will not have effect on physical activity of Lecturers is rejected and the alternate is accepted. This study supports the findings of Burke et al. (2015) posited that effectiveness of mobile health technologies (mHealth) for managing weight, increasing physical activity, quitting smoking and controlling high blood pressure, high cholesterol and diabetes.

Conclusion

From the findings of this study, it was concluded that:

The advancement in artificial intelligence and mobile technology has brought about the utilisation of Smartphones with which various health applications can be downloaded to improve the health and well-being of user which seem to influence the knowledge of utilisation of the mobile Apps and in turn lead to healthy eating and drinking habits and also improve physical activity level thereby preventing sedentary lifestyles that could lead to cardiovascular diseases, diabetes and some types of cancers among others which are killer diseases worldwide.

Recommendation

Proper health education of staff to ensure increase in awareness and utilisation of Smartphone health applications rather than using Smartphone for unimportant purpose that will later have side effect on health.

Encourage downloads of applications on healthy eating to improve eating habits and also reduce diet related diseases. Applications that will help to maintain adherence to physically active lifestyles should also be encouraged within the University system to prevent cardiovascular diseases and promote healthy lifestyle.

References

American College of Cardiology (2019). Five or more hours of smartphone usage per day may increase obesity: Recent study found risk of obesity increased by 43%. Available at http://www.sciencedaily.com/releases/2019/07/190725150918.htm

Bui, N., Yen, J., & Honavar, V. (2016). Temporal causality analysis of sentiment change in a cancer survivor network. *IEEE transactions on computational social systems*, *3*(2), 75-87.

Burke, L. E., et al (2015). Current science on consumer use of mobile health for cardiovascular disease prevention: a scientific statement from the American Heart Association. *Circulation*, *132*(12), 1157-1213.

Dallinga, J. M., Zwolsman, S. E., & Dekkers, V. T. (2016). Can apps encourage a healthier and more active lifestyle?. *Nederlands tijdschrift voor geneeskunde*, *160*, D329-D329.

Glynn, L. G., et al (2014). Effectiveness of a smartphone application to promote physical activity in primary care: the SMART MOVE randomised controlled trial. *British Journal of General Practice*, *64*(624), e384-e391.

Jindal, G., & Anand, M. (2012). Android applications with artificial intelligence in mobile phones. *Research Expo International Multidisciplinary Research Journal II*, 2250-163.

Middelweerd, A., Mollee, J. S., van der Wal, C. N., Brug, J., & Te Velde, S. J. (2014). Apps to promote physical activity among adults: a review and content analysis. *International Journal of Behavioral Nutrition and Physical Activity*, *11*(1), 1-9.

Mosa, A. S. M., Yoo, I., & Sheets, L. (2012). A systematic review of healthcare applications for smartphones. *BMC Medical Informatics and Decision Making*, *12*(1), 1-31.

Stephens J. & Allen J. (2013). Mobile phone interventions to increase physical activity and reduce weight: a systematic review. *Journal of Cardiovascular Nursing, 28*(4), 320–9.

West, J. H., Hall, P. C., Hanson, C. L., Barnes, M. D., Giraud-Carrier, C., & Barrett, J. (2012). There's an app for that: content analysis of paid health and fitness apps. *Journal of Medical Internet Research*, *14*(3), e72.

