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Health Promotion Enhancement Using Artificial Intelligence (AI) Among Science Lecturers At Federal College of Education (Technical), Umunze.

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Abstract
In the recent years, there has been a growing recognition of the need to integrate technology into health promotion strategies. Artificial Intelligence (AI), which refers to computer systems capable of performing tasks typically require human intelligence is transforming health care delivery and preventive health systems world wide. The study adopted a descriptive survey design in investigating Health Promotion Enhancement Using Artificial Intelligence Among Science Lecturers at Federal College of Education (Tech), Umunze. Four research questions which are in line with four purposes guided the study. The population of the study is one hundred and twenty-five (125) which science lecturers in the seven (7) departments in the school of sciences at F.C.E(T) Umunze. A purposive sampling technique was adopted to select sixty (60) science lecturers in all the departments who have basic awareness or access of AI technologies. Structured Questionnaire titled "AI-Enhanced Health Promotion (AI.EHP)" developed by the researchers was used for data collection. The instrument yielded a reliability co-efficient of 0.82 indicating high reliability. Data was analyzed using mean and standard deviation. The mean of 2.50 and above indicated agreement while below 2.50 indicated disagreement. The findings reveals among others moderate level of awareness of AI tools among science lecturers, relatively low level of utilization of AI tools. Based on the findings, the study recommended that institutions should organize workshops and training programs for science lecturers to enhance their digital literacy and practical skills in using AI tools for health promotion, institutional policies should be developed to support the integration of AI tools into staff wellness programs among others.

Keywords: Health, Health Promotion and Artificial Intelligence

Introduction

In the recent years, the integration of artificial intelligence (AI) into various sectors has transformed traditional approaches to problem-solving, including the field of health promotion. As health challenges continue to grow in complexity especially among academic professionals, innovative methods are needed to improve awareness, monitoring and behavioural change. As opined by Ekenedo (2024), educating people and increasing their knowledge is considered among the main elements of empowerment. Supporting the opnion of Ekenedo, Oguegbu (2022), and Mohammed (2022), affirmed that a nation with healthy individuals stands to excel in national growth and development. It is truism that health is wealth and ones wealth depends on ones health.

Health can be defined as a state of wellbeing of an individual. It can also be said to be a complete physical, mental and social well-being of an individual not merely the absence of disease or infirmity. Health is influenced by a complex interplay of determinants such as genetics, environment, lifestyle behaviours, socio-economic status and access to health care (Braveman & Gottlieb, 2014). In recent years, technology especially artificial intelligence (AI) has become powerful tool in addressing these determinants. Thus, helping to improve health access, disease prevention and behavioural change as described by Topol (2019). In the digital age, technology has become an important enabler of health particularly through AI applications. According to Lee, Yoom and Hwang (2021), these capabilities are especially useful in occupational settings where time constraints and stress often prevent proactive health management and health promotion.

Health promotion is the process of enabling people to increase control over and to improve their health. It involves empowering individuals and communities to take control of their health and make informed decisions, addressing social determinants such as poverty, education and environment which impact health outcomes, building healthy public policy by creating policies that support health and well-being. Health promotion aims to empower people to have more control over aspects of their lives that affect their health (Elsevier, 2024). Health promotion is a means of increasing individual and collective participation in health action and strengthening progammes through the integrative use of various methods. These methods are combined through comprehensive approaches which ensure actions at all level of society, thus leading to enhanced health impact as acknowledged by Egger (2020). Health promotion means improving, advancing, supporting, encouraging and placing health higher on personal and public agencies through artificial intelligence technological application.

Health promotion is giving people the information or resources they need to improve their health. It can be said to be the process of disease prevention and promoting health through healthy behaviours and environment. It involves public policy that addresses health determinants such as income, housing, food security, employment and quality working conditions. Health promotion is a vital component of public health that empowers individuals and communities to take control over factors that influence their health. It involves not just individual actions but also structural and policy-level interventions to foster heavier environment (Okafor & Umeh 2020). In academic institutions especially among science lecturers, health challenges such as work-related stress, sendentry lifestyle, mental fatigue as stated by Adebayo and Oyetunde (2020), are challenges that can negatively impact the productivity and effectivenss of lecturers who are central to educational and national development.

In educational sector, science lecturers are often early adopters of emerging technologies and are therefore well positioned to benefit from AI-driven health innovations. However, despite global advancements in AI-based health promotion, its application in Nigerian academic institutions remain limited. According to Adepoju (2021), infrastructural challenges, low awareness, limited digital literacy and institutional resistance to change are among the factors that hinder adoption of AI-driven technologies for health promotion. Health promotion as defined by World Health Organisation (WHO) (2021), is the process of enabling individuals to increase control over and improve their health. According to WHO, health promotion encompasses a wide range of social and environmental interventions designed to benefit and protect individual and community health and quality of life by addressing and preventing the root causes of ill health, not just focusing on treatment and cure. Therefore, in academic institutions especially among science lecturers, health promotion is essential in ensuring mental, emotional and physical well-being. Supporting this, Okafor and Umeh (2020), stated that science lecturers are subjected to long working hours, sedentary lifestyles, stress related to teaching and research that can contribute to health deterioration if not properly managed. And for this, effective strategies are needed to encourage healthy behaviours among these lecturers under study and that could be achieved through the application of artificial intelligence driven technologies.

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are capable of learning, reasoning and making decisions. Although, AI use in education is often associated with learning analytics and administrative automation, its potential in staff wellness and health promotion is gaining attention. Studies show that lecturers who use AI tools to monitor sleep, stress and exercise patterns tend to report better physical and mental well-being (Ogunyemi & Musa, 2021). However, the adoption of AI tolls in Nigerian tertiary institutions remains low due to lack of awareness, infrastructure limitations and skepticism towards technology. In healthcare and wellness, AI technologies such as chatbots, virtual health assistants, wearable fitness trackers and AI-driven

mobile apps are increasingly used for monitoring vital signs, suggesting personalized fitness and diet plans, detecting early signs of diseases and providing mental health support as acknowledged by Adebayo and Hassan (2022). AI promotes precision health by offering personalized feed back and promoting proactive health management. For instance, AI- powered apps like Fitbit, goggle fit and apple health track users' activity provides real time advice that helps in cultivating healthy habits that enhances health promotion for academic staff. This study focuses on examining how artificial intelligence can be utilized to enhance health promotion among science lecturers at Federal College of Education (Tech), Umunze by investigating current health practices, level of awareness and the potential effectiveness of AI tools.

Statement of the Problem

Science lecturers play crucial roles in promoting health and well-being among students but traditional health promotion methods may be limited in their effectiveness and reach. Science lecturers in particular face variety of stressors including long working hours, research pressures, administrative duties and extensive interactions with students and limited opportunities for wellness activities. In such context, there is the need to highlight the potentials for AI enhancement for health promotion among science lecturers. The application of artificial intelligence (AI) in health promotion remains under- explored in this context. And there is need for little empirical evidence on how AI tools are being utilized, accepted or effective in addressing lecturers' health needs. This app posses a major challenge to improving the health status and productivity of science lecturers who are expected to be role models in both academic excellence and healthy living. Hence, this study seeks to investigate on how AI can be utilized to enhance health promotion among science lecturers within the institution under study.

Purpose of the Study

Specifically, the study sought to:

1. ascertain the extent of awareness of Artificial Intelligence (AI) applications tools for health promotion among science lecturers at Federal College of Education (Tech), Umunze.
2. find out the extent of utilization of AI tools for health promotion among science lecturers at Federal College of Education (Tech), Umunze.
3. explore the barriers to adopting AI for health promotion among science lecturers at Federal College of Education (Tech), Umunze.
4. suggest strategies for integrating AI for health promotion among science lecturers at Federal College of Education (Tech), Umunze.

Research Questions

To guide the study, the following research questions were formulated

1. To what extent is the level of awareness of artificial Intelligence (AI) application tools for health promotion among science lecturers at Federal College of Education (Tech), Umunze?
2. To what extent is the utilization of AI tools for health promotion among science lecturers at Federal College of Education (Tech), Umunze?
3. What are the barriers to adopting AI for health promotion among science lecturers at Federal College of Education (Tech), Umunze?
4. What are strategies for integrating AI for health promotion among science lecturers at Federal College of Education (Tech), Umunze?

Methods

The study adopted descriptive survey research design. The design was chosen because it allows for the collection of detailed information from a specific population with the aim of understanding their perceptions, knowledge and practices regarding health promotion and the integration of Artificial Intelligence (AI) tools. The population of the study is one hundred and twenty five (125) science lecturers from the seven (7) Departments in School of Sciences at Federal College

of Education (Tech), Umunze. A purposive sampling technique was adopted to select sixty (60) science lecturers from the seven departments who have basic awareness or access of digital or AI technologies. The sample size was considered adequate for the scope of the research. A structured questionnaire titled "AI-Enhanced Health Promotion (AI-EHP)" was developed by the researchers for data collection. The instrument was divided into two (2) parts, parts A and B. Part A sought information on personal data of the science lecturers while part B is further divided into four (4) sections according to the four (4) research questions consisting of twelve (12) question items. The research adopted four-point rating scale of very high extent (VHE), High extent (HE), and very low extent (VLE) for the first two research questions and Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) for the last two research questions. These have the values of 4,3,2 and 1 for positive statements and 1,2,3 and 4 for negative statements respectively. The instrument was validated by two experts, one from Physical and Health Education department and the other from department of Educational Technology, all from Federal College of Education (Tech), Umunze. The experts reviewed the items in terms of its clarity, ambiguous language and relevance to the research questions of the study. Their corrections were effected and incorporated into the final draft of the instrument. The reliability of the instrument was tested using a pilot study, yielding cronbach Alpha reliability co-efficient of 0.82 indicating high reliability. Sixty (60) copies of the questionnaire consisting twelve (12) question items were distributed by the researchers and collected at 100 percent return rate. Data generated were analysed using a descriptive statistics of mean and standard deviation. The criterion mean was placed at 2.50. Therefore, any mean score of 2.50 and above indicated agreement and any mean score below 2.50 was regarded as disagreement.

Results

Results are presented in tables according to research questions.

Research Question One: To what extent is the level of awareness of artificial intelligence application tools for health promotion among science lecturers at Federal College of Education (Tech), Umunze?

Table 1: Mean and Standard Deviation Scores of Respondents on the Level of Awareness of Artificial Intelligence Application Tools for Health Promotion.

S/N	Items	X	SD	Remark
1.	I am aware of AI-based mobile health application such as Fitbits, chatbots etc.	3.25	0.55	HE
2.	I understand how AI can support and enhance health promotion	2.10	0.60	LE
3.	I have attended workshops/seminars on AI skills for health promotion	1.75	0.50	VLE
Grand mean		**2.36**	**0.55**	**LE**

The findings in **Table 1** indicate a low or moderate level of awareness of AI application tools for enhancing health promotion among science lecturers under study. A significant number of respondents were aware of AI-based health applications and understood the role of AI in health promotion.

Research Question Two

To what extent is the utilization of AI tools for health promotion among science lecturers at Federal College of Education (Tech) ,Umunze?

Table2: Mean and Standard Deviation of the Respondents on the Extent of Utilization of AI Tools for Health promotion.

S/N	Items	X	SD	Remark
1.	I use AI health apps to track my fitness	2.20	0.65	LE
2.	I use wearable devices for health enhancement	1.80	0.60	LE
3.	I use AI-based platforms to get health tips	1.90	0.67	LE
Grand mean		**1.97**	**0.67**	**LE**

According to **Table 2,** The extent of actual utilization of AI tools by Science Lecturers under study is relatively low. Although, some lecturers use mobile apps to monitor their fitness as well as their health, fewer used wearable devices and platforms that offer comprehensive AI-driven health promotion .

Research Question Three

What are the barriers to adopting AI for health promotion among Science Lecturers at Federal College of Education (Tech),Umunze?

Table3: Mean and Standard Deviation of the Respondents on the Barriers to Adopting AI for Health Promotion.

S/N	Items	X	SD	Remark
1.	I lack knowledge on how to use AI tools for health promotion	3.40	0.45	Agree
2.	AI tools are too expensive	3.25	0.60	Agree
3.	I am concerned about data privacy in AI	2.30	0.65	Disagr health platforms
Grand mean		**2.98**	**0.57**	**Agree**

As shown in **Table 3,** Science Lecturers under study face several significant challenges towards the adoption of AI for health promotion. This reveals lack of technical knowledge, high cost of AI tools but not concerned over data privacy in AI platforms

Research Questions Four

What are the strategies for integrating AI for health promotion among Science Lecturers at Federal College of Education (Tech),Umunze?

Table 4: Mean and Standard Deviation of the Respondents on the Strategies for Integrating AI for Health Promotion.

S/N	Items	X	SD	Remark
1.	Integration of AI into curriculum in schools and colleges.	3.45	0.68	Agree
2.	Continuous AI training for lecturers should be adopted in the tertiary institutions	3.50	0.65	Agree
3.	Online AI health forum/counselling should be created	2.75	1.10	Agree
Grand mean		**3.23**	**0.81**	**Agree**

These strategies were all agreed by the respondents as being effective towards health promotion using AI. The relatively Low standard deviation value even indicates a high level of consensus among the Lecturers. This implies that there is strong support for implementing educational and training – focused AI strategies. This highlights the belief that increased knowledge and exposure to AI tools which will enhance the Lecturers capacity to promote health more effectively.

Discussion of the Findings

The results from **Table 1** indicated low or moderate level of awareness of AI application tools for health promotion among science lecturers under study. This showed that there is limited awareness, practical exposure and structured education on AI health application. This aligns with the study by Okeke (2021), which found that awareness of AI tools in Nigerian educational institutions exists but is not always accompanied by training or deep understanding.

Results from **Table 2** revealed relatively low utilization of AI tools among science lecturers at F.CE(T), Umunze. This indicates that significant number of science lecturers do not use wearable devices, AI platforms or even use AI apps to track their well-being and fitness. This gap between awareness and utilization may be attributed to factors such as lack of access , cost of AI devices, or limited technical know-how as confirmed by Nwachukwu , Obi and Umeadi (2023).

The findings from **Table 3** showed that science lecturers face several challenges towards positive adoption of AI application tools for health promotion. Such challenges / barriers as agreed by these respondents include lack of technical knowledge of AI tools and their cost. These barriers are consistent with existing literature by Ogunyemi and Musa (2021), which highlights digital literacy , affordability and security concerns as major barriers to AI adoption in African Institutions.

The results from **Table 4** showed strong support for educational and training –based strategies such as continuous AI training for lecturers, integration of AI into curriculum and workshops with the highest mean rating. This indicates that science lecturers place high value on knowledge based and training –oriented approaches to AI integration. The science lecturers see AI as most beneficial when it enhances their understanding of health related topics and is integrated into teaching and learning

processes. The related low standard deviations for these strategies also showed consensus among the respondents, suggesting that such approaches are accepted and considered feasible.

Conclusion

This study which investigated the Health Promotion Enhancement Using Artificial Intelligence among science lecturers at Federal College of Education (Tech), Umunze reveals a low or moderate level of awareness and a generally positive perception of AI roles in health promotion . However, the actual utilization of AI tools for their personal health promotion remains low due to certain barriers such as limited technical knowledge, high cost of AI devices notwithstanding their data privacy concerns. Despite these limitations, the lecturers acknowledge the potential benefits and suggested strategies of AI in improving their wellbeing and productivity .Therefore , integrating AI into institutional health strategies hold promise for transforming health behavior , fostering proactive wellness practices and improving overall job performance among science lecturers and academic staff at large.

Recommendations

Based on the findings of this study, the following recommendation were made;

1. Regular sensitisation programs should be implemented to increase awareness of the benefits of AI for personal and occupational health among all academic staff.
2. The college administration or health units should consider collaborating with technology firm to provide free access to wearable health applications
3. Institution policy should be developed to support the integration of AI tools into staff wellness programs while ensuring use and protection personal health data.
4. Institution should organize workshop and training programs for science lecturers to enhance their digital literacy and practical skills in using AI for health promotion.

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