

# Innovations

## **Assessing the Effectiveness of Ai-Powered Apps on Health Information Dissemination among Academic Staff of Prince Abubakar Audu University, Anyigba**

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**Abstract:** *This study assessed the effectiveness of AI-Powered Apps on health information dissemination among academic staff of Prince AbubakarAudu University, Anyigba. AI-Powered Health Apps represents a prominent example of AI-powered technology in the healthcare domain, offering personalized health advice and information to users. This study aims to explore how these apps impact the delivery of health information among the respondents. Technology Determinism theory served as the theoretical framework. The study adopted quantitative survey design to gather data from 200 out of 364 members of academic staff of Prince AbubakarAudu University, Anyigba using purposive and convenient sampling techniques. The researchers analyzed data regarding the level of awareness, adoption, and the effectiveness of AI-Powered Apps for health information. Findings of the study revealed a growing awareness of AI-powered health information apps. However, the ability to name specific apps was lower, highlighting the need for increased education and outreach about available resources. The study revealed a moderate adoption of AI health information apps among the respondents. There was a positive perception of the apps' accuracy, knowledge acquisition benefits, and user-friendliness. The study recommended that Prince AbubakarAudu University should organize workshops or seminars to educate academic staff about the potential of AI-powered health information apps.*

**Keywords:** *Artificial Intelligence, AI-powered apps, Health information, Effectiveness.*

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## Introduction

In the digital age, the landscape of health information access has undergone a dramatic shift. The proliferation of the internet and mobile technologies has empowered individuals to readily seek out health information at their fingertips (Eysenbach & Powell, 2005). This newfound accessibility offers tremendous potential for empowering individuals to make informed decisions about their health and well-being (Norman et al., 2007).

AI-Powered Health Apps represents a prominent example of AI-powered technology in the healthcare domain, offering personalized health advice and information to users. Artificial intelligence (AI)-powered applications (apps) have emerged as a particularly promising tool for disseminating health information to diverse audiences. These apps leverage sophisticated algorithms to personalize information delivery, tailoring content to individual needs, preferences, and health literacy levels (Luo et al., 2022). This targeted approach can significantly enhance knowledge retention and behavior change compared to traditional, one-size-fits-all methods (Krebs & Duncan, 2017).

Furthermore, AI-powered health apps offer unparalleled convenience and accessibility. Unlike traditional methods such as lectures, workshops, contact with doctors which can be time-consuming and geographically restrictive, these apps allow users to access health information anytime, anywhere (Zheng et al., 2020). This flexibility is particularly valuable for busy academic staff who may struggle to carve out time for lengthy information dissemination sessions.

However, it is important to acknowledge that traditional methods like lectures, workshops and physical contact with health personnels still hold value. These methods can foster a sense of community and allow for real-time interaction with healthcare professionals to address specific concerns. The ideal approach may lie in a blended model that leverages the strengths of both traditional and AI-powered methods (Glance et al., 2018).

AI-powered applications (apps) hold immense potential for revolutionizing the way health information is disseminated, offering several advantages that cater specifically to the needs of busy academic staff at Prince Abubakar Audu University (PAAU). One key strength lies in their ability to personalize information delivery. Unlike traditional, one-size-fits-all methods, AI-powered apps can leverage sophisticated algorithms to tailor content to individual user preferences and learning styles (Luo et al., 2022). This personalization can significantly enhance user

engagement and knowledge retention. For instance, an app might present information through interactive quizzes, gamified elements, or text tailored to a user's preferred reading level (Krebs & Duncan, 2017). This targeted approach ensures that users receive the most relevant and impactful health information for their specific needs.

Furthermore, AI-powered apps offer unparalleled convenience and accessibility. Unlike lectures or workshops, which are often restricted by time and location, these apps empower users to access health information anytime and anywhere (Zheng et al., 2020). This flexibility is particularly valuable for academic staff who juggle demanding workloads and may struggle to attend in-person information sessions. Imagine a scenario where a professor can quickly access evidence-based information on a specific health topic during a break between classes, directly on their smartphone. This real-time access to knowledge can empower them to integrate health information into their teaching or personal lives seamlessly.

Moreover, AI-powered apps can leverage gamification and other interactive features to make learning about health information engaging and enjoyable (Ryan et al., 2006). This can be particularly beneficial for adults who may find traditional educational methods less stimulating. Additionally, some AI-powered apps can incorporate social networking features, fostering a sense of community and allowing users to connect with others who share similar health interests (Eysenbach & Powell, 2005). This social support can further enhance motivation and behavior change.

AI-powered apps offer a multitude of advantages for disseminating health information among academic staff at PAAU. Their ability to personalize content, provide convenient access, and promote user engagement through interactive features positions them as a powerful tool for promoting health literacy and well-being within the academic community. However, the level of effectiveness of these apps in terms of health information dissemination has not been explored, hence, the purpose of this study.

### **Statement of the Problem**

While the internet offers vast amounts of health information, traditional methods of disseminating this information to academic staff, like lectures and workshops, may not be the most effective or accessible (Smith & Zheng, 2020). AI-powered apps have emerged as a promising tool for delivering targeted and convenient health information. However, there is a lack of research exploring the effectiveness of these apps in the specific framework of disseminating health information among academic

staff at universities in developing countries like Nigeria, hence the need to fill this gap in knowledge.

### **Objectives of the Study**

The main aim of the study is to assess the effectiveness of AI-Powered Apps on health information dissemination among academic staff of Prince AbubakarAudu University, Anyigba. The specific objectives are to:

1. find out the level of awareness of AI-powered health information apps among academic staff of PAAU.
2. assess the level of adoption of AI-powered health information apps among academic staff of PAAU.
3. evaluate the effectiveness of AI-powered health information apps in improving knowledge acquisition on specific health topics among academic staff at PAAU.

### **Research Questions**

1. What is the level of awareness of AI-powered health information apps among academic staff of PAAU?
2. What is the level of adoption of AI-powered health information apps among academic staff of PAAU?
3. How effective are AI-powered health information apps in improving knowledge acquisition on specific health topics among academic staff at PAAU?

### **Review of Related Literature**

Disseminating accurate and up-to-date health information is crucial for healthcare among individuals including academic staff of universities. Artificial intelligence (AI)-powered applications offer a promising avenue for delivering targeted and personalized health information. This review examines relevant studies to assess the effectiveness of AI-powered apps in disseminating health information among academic staff at Prince AbubakarAudu University (PAAU), Anyigba, Nigeria.

Several studies highlight the potential of AI-powered apps for health information dissemination. For instance, Zhang et al. (2020) explored the use of a large language model (LLM) application to deliver urology-related information. Their findings suggest that LLMs can be effective in providing appropriate and readable health content.

A study by Wright et al. (2022) examines the effectiveness of a mobile AI assistant in delivering evidence-based medical updates to physicians. The primary objective was to assess the impact of the AI assistant on physicians' knowledge retention and

self-reported use of the information in patient care. A randomized controlled trial was conducted with physicians divided into intervention (using the AI assistant) and control groups. Knowledge was assessed through pre- and post-intervention tests, and self-reported use was measured by surveys. The study found that physicians in the intervention group showed significantly higher knowledge retention and reported using the information more frequently in patient care compared to the control group. This study suggests that AI-powered apps can be effective in disseminating health information to physicians and influencing their practice.

Another study by Lin et al. (2021) explores user acceptance of an AI-powered chatbot for delivering public health information during the COVID-19 pandemic. The research aimed to assess factors influencing user acceptance of the chatbot, including perceived ease of use, usefulness, and satisfaction. An online survey was conducted among users of the chatbot, measuring their perceptions through standardized questionnaires. The study revealed positive user acceptance, with participants reporting the chatbot to be easy to use, helpful in accessing information, and fostering satisfaction. This study emphasized the potential of AI-powered chatbots for disseminating health information to the public and emphasizes the importance of user-centered design for promoting acceptance.

Mukhopadhyay&Mitra (2020) on their parts investigates the impact of AI-powered learning apps on medical students' knowledge acquisition in resource-limited settings. The research aimed to assess the effectiveness of the app in improving students' knowledge compared to traditional learning methods in a medical school located in a resource-limited setting. A quasi-experimental design was employed, with students divided into intervention (using the AI app) and control groups. Knowledge was measured through pre- and post-intervention exams. The study found that students in the intervention group showed a statistically significant improvement in knowledge compared to the control group. This study suggests that AI-powered learning apps can be beneficial for medical education, particularly in settings with limited resources.

Also, Tan et al. (2019) explores the barriers and facilitators influencing healthcare professionals' adoption of mobile health apps. The research aimed to identify factors that promote or hinder the use of mobile health apps among healthcare professionals. Focus group discussions were conducted with healthcare professionals from various disciplines to gather qualitative data on their experiences and perceptions. The study identified several barriers, including concerns about data privacy, security, and information accuracy. Facilitators included ease of use, accessibility of information, and potential for improving patient care. This study highlights the importance of addressing concerns and emphasizing the benefits to encourage healthcare professionals to adopt mobile health apps.

Eze&Gichobi (2018) explores the design considerations for culturally tailored chatbots for disseminating health information in rural African communities. The research aimed to identify best practices for developing chatbots that are culturally appropriate, engaging, and effective in delivering health information. A user-centered design approach was employed, involving community engagement and iterative development of the chatbot prototype. The study highlighted the importance of incorporating local languages, addressing specific health concerns of the community, and ensuring user-friendliness for effective health information dissemination. This study emphasizes the need for culturally sensitive design when developing AI-powered apps for health information dissemination in diverse contexts.

These studies provide valuable insights into the effectiveness, user acceptance, and design considerations for AI-powered apps in disseminating health information to various healthcare stakeholders. There is a gap in research on the effectiveness of AI-powered apps for disseminating health information among academic staff, particularly in the context of Nigerian universities like PAAU. The proposed research aims to bridge this gap by assessing the effectiveness of such apps within the specific environment of Prince AbubakarAudu University.

### **Theoretical Framework: Technological Determinism Theory**

The concept “technological determinism theory” explains the setting of this study. The theory which was propounded by Marshall McLuhan (1964), a Canadian communication scholar, who observed new media technologies in communication, would soon determine social changes, turning the world into a global village. He believes socio-political, economic and cultural changes are inevitably based on development and diffusion of technology. McLuhan argued technology undoubtedly causes specific changes on how people think, how society is structured and the form of culture created. This theory portends that, given the emergence of Internet and its adoption and relevance in mobilizing people for political activities, there is bound to be an impact on the electoral process and overall political environment. Communication is the basic tenet of technological determinism theory. The theory seeks to explain social and historical phenomena in terms of the principal determining factor which is technology (Nwabueze and Ezebuenyi, 2022).

Technological determinism theory posits that technology is the driving force of social change (Heeks, 2008). This theory suggests that the development and adoption of new technologies inevitably lead to significant changes in society, including our behaviors, values, and institutions. Proponents of technological determinism might argue that AI-powered apps will fundamentally alter how academic staff in Prince AbubakarAudu University access and utilize health

information. These apps have the potential to increase accessibility, personalize information delivery and enhance information retention. These potential changes, according to technological determinism, would not simply be driven by the choices of individual staff members but by the inherent capabilities and functionalities embedded within the AI-powered apps themselves. Technological determinism offers a valuable lens for examining the potential impact of AI-powered apps on health information dissemination among academic staff at PAAU.

**Methodology**

The study adopted a quantitative survey design to gather data from 200 out of 364 members of academic staff of Prince AbubakarAudu University, Anyigba using purposive and convenient sampling techniques. The researcher made use of structured Likert scale questionnaire as the instrument for data collection. The research instrument was subjected to content validity and reliability test will be done using test retest method. To confirm the reliability, same instrument will be administered to the same respondents at two intervals. The obtained data from the responses will be calculated using the Guttman scale of coefficient to evaluate the instrument’s reliability. The Mean and standard deviations will be used to analyze the data. The Statistical Package for Social Sciences (SPSS, version 20) will serve as the analytical tool.

**Data Presentation and Analysis**

**Table 1: Awareness of AI-powered health information apps**

Statement	A	SA	D	SD	N	X	Standar d deviatio n	Decision
I am aware of AI-powered applications that can provide health information.	18	32	90	60	200	3.12	0.83	Accepted
I have heard about AI-powered health information apps specifically designed for academic staff.	25	40	85	50	200	2.98	0.87	Rejected
I can name at least one example of an AI-powered health information app.	42	72	54	32	200	2.24	1.01	Rejected

X = Mean, N = No of Respondents, Criterion = 3.00

Data from table 1 above suggests a slightly significant level of awareness of AI-powered health information apps. A majority (over 60%) are aware of AI-powered health information apps in general.

**Table 2: Adoption of AI-powered health information apps**

Statement	A	SA	D	SA	N	X	Standard deviation	Decision
I currently use an AI-powered app to access health information.	38	60	68	34	200	2.72	0.99	Rejected
I have downloaded an AI-powered health information app in the past but do not currently use it.	30	48	62	60	200	2.88	0.95	Rejected
I would be interested in using an AI-powered health information app if it were available to me.	12	8	80	100	200	3.44	0.79	Accepted

X = Mean, N = No of Respondents, Criterion = 3.00

Data from table shows that even though half of the respondents are not currently adopting the app for their health information, they are interested in doing so. A significant portion expressing interest in the app for their health information.

**Table 3: Effectiveness of AI-powered health information apps (Only those who used the app)**

Statement	A	SA	D	SD	N	X	Standard deviation	Decision
The AI-powered health information app I use provides me with accurate and up-to-date health information.	12	8	40	40	100	3.10	0.88	Accepted



The information provided by the AI-powered health information app has helped me improve my knowledge of specific health topics.	8	32	44	16	100	3.16	0.92	Accepted
I find the AI-powered health information app to be a user-friendly and efficient way to learn about health topics.	4	20	36	40	100	3.32	0.86	Accepted

X = Mean, N = No of Respondents, Criterion = 3.00

Among those using AI health apps, there is a positive perception of the apps' features and impact on their health awareness and knowledge.

**Discussions of Findings**

Research question one seeks to find out the level of awareness of AI-powered health information apps among academic staff of PAAU. Table 1 provides answers to the research question. A significant portion (over 60%) shows their awareness of AI-powered health information apps. This aligns with findings from Zhang et al. (2020) who observed growing public interest in AI for health information dissemination. While awareness is present, the ability to name specific apps was lower. This suggests a need for increased outreach and education about available resources. This finding is similar to a study by Omekwu (2017) which highlighted challenges faced by academics in Nigeria in accessing and utilizing health information resources such as AI powered health information apps.

Research question two seeks to assess the level of adoption of AI-powered health information apps among academic staff of PAAU. Table 2 provide answers to the research question. The data from the table suggests moderate adoption of AI health information apps among the academic staff This is comparable to findings by Tan et al. (2019) who reported a mix of adoption and non-adoption of mobile health apps among healthcare professionals. A high level of interest in using an AI health information app specifically provided by the university was observed. This indicates potential value in exploring the development and implementation of such a resource in Prince AbubakarAudu University.

Research question three seeks to evaluate the effectiveness of AI-powered health information apps in improving knowledge acquisition on specific health topics among academic staff in Prince AbubakarAudu University. Table 3 provide answers to the research question. The participants who currently use AI health information apps reported a positive perception of the apps' accuracy, helpfulness in knowledge acquisition, and user-friendliness. This aligns with studies by Wright et al. (2022) and Mukhopadhyay&Mitra (2020) which demonstrated the effectiveness of AI-

powered apps in delivering health information and improving knowledge among physicians and medical students, respectively.

### **Conclusion**

This study revealed a growing awareness of AI-powered health information apps, with a significant portion having general knowledge of these tools. However, the ability to name specific apps was lower, highlighting the need for increased education and outreach about available resources. While adoption of AI health information apps remains moderate, a high level of interest on the app was observed. This suggests potential value in exploring the development and implementation of such a resource. Among those who currently use AI health information apps, the data indicates a positive perception of their accuracy, knowledge acquisition benefits, and user-friendliness. This aligns with existing research demonstrating the effectiveness of AI-powered apps in healthcare settings.

**Recommendations:** Based on the findings of the study, the following are recommended:

1. Prince AbubakarAudu University should organize workshops or seminars to educate academic staff about the potential of AI-powered health information apps. Information booths or targeted email campaigns can further raise awareness of existing resources.
2. Considering the high interest, Prince AbubakarAudu University should explore the development of a university-specific AI health information app for staff use.
3. Further research should investigate the specific barriers and factors influencing the adoption of AI health information apps among academic staff at PAAU.

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