

Influence of Virtual Reality as a Channel of Communication for Health Education among Media Audiences in South West Nigeria

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Abstract

Virtual reality as a channel of communication for health education among media audiences is a unique modern-day technology that has the potential to change the way health information is communicated and learned. This study examines the influence of virtual reality as a communication channel for health education among the media audience in Southwest Nigeria. The study employs a survey research method, gathering data from the population of Lagos residents. Copies of the questionnaire are administered to a sample size of 400 respondents in Lagos State to elicit information from them. The study reveals that high awareness of virtual reality, moderate cultural relevance, and significant influence on health behaviours, although challenges such as cost and access remain barriers. The high level of awareness suggests that the media audience is beginning to understand new digital developments in health communication. Statistical analysis reveals that cultural relevance has significant predictive power for the educational impact of virtual reality. In conclusion, the study affirms that virtual reality is a transformative health education tool when culturally adapted and adequately supported by infrastructure and awareness. Therefore, being exposed to virtual reality health content changes life choices and improves health behaviour. This study indicates that virtual reality can effectively transpose cultural significance when integrated and presented, and when relevant and accessible, can reduce barriers and communicate to audiences with different literacy levels.

Keywords: Communication, Cultural Appropriateness, Health Education, Media Audience, Virtual Reality.

Introduction

Virtual reality is the construction of a computer-generated simulation of a three-dimensional (3D) image or setting in which a user can interact with it. It could be touched by a user as if it were an actual physical body (which is also the case with certain electronic equipment, such as in a headset with a built-in screen, virtual reality, or a glove with sensors (1), because VR is a new media technology that allows people to share information and alter their perception of reality. In today's age of disseminating information, different channels

are used to reach the target audiences and media audience of various products and services. Virtual reality is one of the new digital channels of communication, and it is a little bit of a paradox because it is applied at different levels and sectors of life. In virtual reality, the audience is fully immersed in a three-dimensional environment that stimulates their senses in real-time. In virtual reality, media audiences are in the physical environment, and digital information is superimposed over their actual surroundings (2).

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In recent years, anatomy and clinical skills have been two areas of health professional education where virtual reality has shown promise as a new means of communication (3). For example, there are ways in which health educators can convey three-dimensional (3D) representations of complex human body parts in virtual reality to communicate and educate patients. In other words, virtual reality provides a higher level of visualisation, which allows for more effective conveyance of various health components (and aspects) to patients virtually. In addition, virtual reality has been used as a communication channel to deliver treatments for physical impairments, as well as a rehabilitation method for those with stroke, cerebral palsy, severe burns, Parkinson's disease, Guillain-Barré syndrome, and multiple sclerosis, among others (4).

The rapid technology advances in digital channels of communication have led to innovative approaches to health education (including virtual reality) captivating channel of communication with the potential to revolutionise health education (5). Because virtual reality can create a virtual environment where media audiences are guided toward performing targeted objectives to acquire health education in different fields, the use of virtual reality as a digital medium channel of communication in health education and training has shown great interest (5). Every year, around 310 million medical operations are performed worldwide (6). In addition, following surgical or medical procedures, patients are often debriefed by their physician to discuss their findings and any follow-up care or treatment instructions. In various ways, research indicates that 40-60% of patients struggle to accurately report their physician's expectations 10-80 minutes after receiving information (7). Additionally, over 60% of patients who were interviewed immediately after visiting their doctor misunderstood medication directions (7).

Therefore, the utilisation of virtual reality as a channel of communication for health education gives opportunities for the media audience (medical learners, health patients) to rehearse without being anxious about making mistakes and facing any grave results and to be prepared for recognising the symptoms of a disease, and even conducting complicated operations as well as health patients recovering from psychological and

mental issues. However, existing studies in health communication are mainly focused on traditional channels to disseminate health information to the audience with little attention paid to virtual reality, a digital channel of communication for health education, especially among media audiences in Nigeria, and this is what the study seeks to find out. This study is set to look into virtual reality as a channel of communication for health education among media audiences in Nigeria.

The objectives of the study are to find out the level of awareness of virtual reality as a channel of communication for health education among media audiences, know the cultural relevance of virtual reality as a channel of communication for health education among media audiences, exposure of virtual reality as a channel of communication for health education among media audiences, challenges associated with the usage of virtual reality as a channel of communication for health education among media audiences, and investigate the influence of virtual reality as a channel of communication for health education among media audiences.

In recent years, the development of virtual reality has progressed significantly, and virtual reality has become more popular because it can produce a coherent, replicable, and manageable framework (8). It is now being used in a wide range of industries, including the automotive sector, construction, manufacturing, scientific visualisation, engineering, education, medicine, and healthcare. Virtual reality is seen as a computer-generated simulation that encompasses a wide range of technologies and experiences (9). Virtual reality produces an immersive environment that a person can interact with and explore stimuli that stimulate a person's senses of sight, sound, and sometimes touch. Support for virtual reality is an advanced technology (10). Virtual reality enables media audiences to immerse themselves in a computer-generated environment, simulating real-world experiences through sensory inputs like sight, sound, and touch.

Virtual reality has been widely applied in several fields, including education, healthcare, and communication. For instance, in education, virtual reality offers unique opportunities for enhancing learning experiences, allowing students to explore complex concepts in a controlled and immersive

environment (11). There is emphasis on the diverse applications of virtual reality across different sectors. For example, in the industrial context, virtual reality is used extensively. In engineering, automotive design, and civil administration, it allows operators to interact with virtual prototypes and environments, enhancing the effective and efficient use of the design process (12).

This virtual reality can either simulate the real world or be entirely different, offering endless possibilities for exploration and interaction. In the world of virtual reality, there are different types of simulations that are commonly used today. Each type offers a unique level of immersion and engagement. Other, distinct types of virtual reality include augmented reality and mixed reality.

Non-immersive virtual reality is commonly utilised in applications like architectural visualisation, where the primary goal is to provide a 3D representation without requiring full sensory engagement (13). Non-immersive virtual experiences are often overlooked as a category of virtual reality because they're so commonly used in our everyday lives. Non-immersive virtual reality allows the media audience to enter a computer-generated environment while still being aware of and in control of their physical surroundings. Non-immersive virtual reality is widely used in education and training, where complete immersion is not necessary. For instance, medical students might use 3D anatomical models on a screen to study complex human body systems without the need for a fully immersive setup (14). Non-immersive virtual reality typically involves a desktop or mobile environment where the media audience interacts with the virtual world using traditional input devices like keyboards, mice, or touchscreens.

Higher levels of immersion are possible with semi-immersive virtual reality than with non-immersive versions, frequently thanks to the usage of several monitors or big projection panels that encircle the viewer. This type of virtual reality is common in teaching settings and flight simulators, where striking a balance between practical involvement and immersion is crucial (15). With semi-immersive virtual experiences, the media audience can experience a separate world through a unique combination of digital and physical environments. Media audience experience a hybrid as they stay

aware of their physical surroundings even when fully submerged in the digital image.

According to scholars, fully immersive virtual reality aims to create a completely absorbing experience, often using head-mounted displays (HMDs) and motion-tracking devices to immerse the user fully in the virtual world (16). Fully immersive virtual reality provides the highest level of engagement, as it cuts off external sensory inputs and allows the user to interact with the virtual environment in a way that feels natural. Fully immersive virtual reality is increasingly used in health education, providing simulations where the media audience can practice medical procedures or experience patient perspectives in controlled, risk-free environments. Fully-immersive simulations offer the most realistic and captivating experience by immersing the media audience in an immersive environment that closely resembles their visual and auditory senses (17). To completely immerse themselves in this virtual world, media audiences need specialised equipment, such as head-mounted displays (HMDs) or advanced virtual reality spectacles. Additionally, input tracking technology seamlessly monitors the user's movements, further enhancing the sense of immersion and believability. However, it has been asserted that fully-immersive virtual reality has long been a staple in the gaming and entertainment industries, and its applications are now expanding into other sectors, notably medical (health) education, where its potential for engagement and knowledge retention is being harnessed (18).

In a sweeping overview, virtual reality is viewed as a communication channel that is uniquely positioned to create immersive environments that involve audiences more consciously than traditional media (19). In the context of health education, virtual reality's immersive nature allows the media audience to experience scenarios in a controlled yet realistic manner, enhancing their understanding of complex health issues. For instance, virtual reality simulations can demonstrate the effects of diseases or the importance of a description of some health practices in an easy-to-remember way, and more efficient retrieval of information (19). In addition, virtual reality in health communication offers personalised learning experiences; therefore, the media audience interacts with the content at their

own pace, revisits challenging sections, and explores different scenarios based on their interests or needs. This customisation is particularly beneficial in health education, for which some people may have previous knowledge and different learning preferences. Studies by scholars have found that personalised virtual reality health education programs led to higher user satisfaction and better learning outcomes compared to traditional methods (20). Moreover, virtual reality, i.e., flexible channel of expression, can be applied in various cultural contexts for communication in global health education efforts. Traditional health communication channels often struggle to reach diverse audiences, particularly at geographically varying levels of literacy, e.g., South West Nigeria. Virtual reality has the potential to bridge this gap by providing a visual and experiential communication, i.e., non-textual or spoken communication language. This can be particularly effective in conveying critical health information to populations with limited access to formal education.

In the healthcare sector, the current state of virtual reality has been characterised by notable advancements in technology, including both hardware and software improvements (21). Originally designed mainly for entertainment and gaming, virtual reality has quietly made its way into health care because it can improve a patient's care and medical education. Back in the day, virtual reality was mostly used in healthcare for medical training and simulation, enabling both medical students and professionals to rehearse surgical procedures and clinical scenarios within a secure and supervised virtual setting. Advancements in virtual reality, cheaper and easier-to-use hardware have made it possible to integrate virtual reality into clinical practice (22).

Virtual reality is now a paradigmatic element of communication in health education, offering immersive experiences that enhance learning and engagement (23). Its application in Nigeria, particularly in health education, is a relatively recent development, reflecting broader global trends but adjusted to local needs and challenges. Integration of virtual reality in Health Education in Nigeria started to take off in the early 2020s. Initial efforts focused on exploring the potential of virtual reality to improve health education gaps and social health outcomes. Virtual reality has been used for

medical simulation and public health scenarios, thereby enhancing the training of healthcare professionals and raising public awareness about health issues (24).

Despite virtual reality's promising applications, virtual reality in health education in Nigeria faces several challenges. High costs, limited infrastructure, and lack of technical expertise are notable barriers (25). One of the most significant advances in virtual reality within Nigerian health education has been its use in simulation-based learning. In various ways, virtual reality has been particularly effective on media audiences in anatomy, emergency care, and procedural skills, thereby improving their readiness for clinical practice (26). By allowing medical trainees to simulate surgeries and emergency responses, virtual reality helps refine their technical skills and decision-making abilities (26).

Communication entails the exchange of signals, which can take various forms, including verbal, graphic, gestural, or visual (photographic) cues. Fundamentally, communication relies on the use of codes, which can be conveyed through visual, kinaesthetic, or auditory means, such as eye contact, body language, or vocalisations. Hence, the communication process is considered complete when feedback is provided, wherein the receiver responds to the initial signal by initiating a new cycle of meaning exchange, thereby forming a reciprocal loop (27). This feedback loop is essential for effective communication, as it enables the sender to gauge the receiver's understanding and adjust their message accordingly.

Virtual reality denotes a computer-simulated environment that facilitates human interaction with artificial, 3-D visual and sensory stimuli. This immersive experience is achieved through the utilisation of interactive products (including goggles, headsets, gloves, and body suits) to transmit and receive information in real-time. In a standard virtual reality configuration, in which a user wears a helmet having a stereoscopic screen hence you see animated images of a simulation of reality that mimics reality. This technology allows the media audience to interact with virtual objects and spaces realistically, blurring the distinctions between the physical and digital worlds.

Health education constitutes a distinct profession dedicated to empowering individuals with the knowledge and skills necessary for optimal health

and well-being. This multidimensional field encompasses a range of interconnected domains, including environmental health, physical health, social health, emotional health, intellectual health, and spiritual health, as well as sexual and reproductive health education. By addressing these diverse aspects of health education, professionals' goal is holistic well-being and fostering informed decision-making among individuals and communities.

Virtual reality has had great potential in the field of anatomy visualisation, enabling people to examine the human body in a three-dimensional environment, offering a comprehensive and interactive insight into anatomical structures and bodily functions. Virtual reality enhances spatial awareness, supports visual learning, and assists in understanding intricate anatomical relationships more intuitively by immersing media audiences with virtual anatomical models (28).

One of the underlying benefits of virtual reality as a communications media channel, the immersive nature of its content environments (29). Unlike traditional media, which often relies on passive consumption, virtual reality engages the media audience actively, allowing them to experience it all, about having that "hands-on education with a healthy set of scenarios. health education, where understanding complex concepts and practices can significantly impact behaviour. Studies have shown that virtual reality can more retention and comprehension, so it's the right medium for sharing critical health information, especially in regions where traditional educational resources may be limited (29).

The theory of technological determinism provides a theoretical framework for investigating virtual reality in Nigeria's health education space. The theory explains how technology shapes the media environment, continually changing at a cultural scale, and impacts a person's thinking, behaviour, and actions throughout technological epochs (30). The theory proposes that technology is a crucial part of the cultural environment in which people consume media content and how that technology ultimately shapes their learning, thoughts, and feelings; then, the medium is the message (30). Other scholars took this further by claiming that the actual form and structure of technologies often supersede content (31). Technological determinism, where technology alters social

structures as well as social values, applies directly to virtual reality as a delivery channel to communicate health content to Nigerian audiences. In health education, virtual reality has the potential to even transform learning experiences by creating immersive, interactive virtual environments that can break complicated concepts down into simpler ones. By engaging users completely, virtual reality may create more interest and understanding than previous methods, especially when those methods may be less engaging or clear. The possibility of this impact warrants further consideration of virtual reality in transmitting healthcare messages (31).

So, in this respect, technological determinism explains how the taking up of virtual reality innovations might alter health education practice in Nigeria, expectably enhancing life habits through technology. Additionally, the theories of how technologies shape the growth of societies by changing attitudes and behaviours mean that virtual reality may alter the way in which an audience in Southwest Nigeria comes to develop health education knowledge and consume it. By providing a sense of presence and realism, virtual reality could make health education more personalised, allowing users to experience scenarios that promote behavioural change, such as smoking cessation or disease prevention strategies, in a lifelike environment. Consequently, theoretically, via technological determinism theory, virtual reality is possible as an instrument not only for communication but a catalytic force potentially influential in terms of health attitudes and behaviours of media audiences in Southwest Nigeria.

Methodology

This research employed a survey method to examine virtual reality as a channel of communication for health education among the media audience in South West Nigeria. The study specifically sought to determine the level of awareness of virtual reality as a channel of communication, frequency of exposure to health education through virtual reality, the extent to which virtual reality as a channel of communication influences health education, and the challenges.

The population of this study comprises 16,536,000 residents of Lagos State in Southwest Nigeria.

According to the projected population for the chosen states by the National Bureau of Statistics, thus, however, Lagos was purposively selected for this study because the region boasts significant urbanisation and diverse demographics, making it

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = sample size

N = population size

e = level of precision (sampling error, expressed as a decimal, e.g., 0.05 for ±5%)

Hence, the sample size for this study is 400.

Multistage sampling was adopted to break Lagos State into local government areas where the hospitals are using virtual reality for health education; there are twenty local government areas in Lagos State, namely: Agege, Ajeromi-Ifelodun, Alimosho, Amuwo-Odofin, Apapa, Badagry, Epe, Eti-Osa, Ibeju-Lekki, Ifako-Ijaiye, Ikeja, Ikorodu, Kosofe, Lagos Island, Lagos Mainland, Mushin, Ojo, Oshodi, Isolo, Shomolu, and Surulere; hence, Lagos Island LGA was randomly selected. Furthermore, Lagos Island Local Government Area in Lagos State has ten electoral wards (Ward A, Ward B, Ward C, Ward D, Ward E, Ward F, Ward G, Ward H, Ward I, and Ward J); therefore, Ward A was purposively selected. In the last stage, a convenient sampling technique was adopted in this study to collect data from respondents who would be conveniently available in each of the electoral wards. The reasoning behind this approach is that testing all electoral wards may be practically unfeasible. Consequently, the researcher selected respondents based on their proximity to examine the influence of virtual reality as a channel of communication for health education.

The questionnaire was adopted for this study to gather data from 400 respondents. The questionnaire was divided into five sections. The first section (SECTION A) covers the respondents

a representative microcosm for evaluating the adoption of emerging technologies like virtual reality in health communication (32).

Hence, using Taro Yamane's formula;

[1]

demographic information, the second section (SECTION B) to find out the level of awareness of virtual reality for health education, the third section (SECTION C) to examine the cultural relevance of virtual reality for health education, the fourth section (SECTION D) to examine respondents' exposure to health education through virtual reality, fifth section (SECTION E) to examine the extent to which virtual reality influences health education. This questionnaire contained closed-ended questions to give respondents the option of choosing from alternatives.

The study conducted an empirical analysis by gathering primary data through a questionnaire. The questionnaire was divided into two parts: the first part focused on gathering demographic information from the respondents, while the second part contained Likert scale questions ranging from strongly disagree to strongly agree about the impact of virtual reality as a communication tool for health education among media consumers.

To further ensure the reliability of the instrument (questionnaire), Cronbach's Alpha Reliability was adopted to determine agreement between variables. Cronbach's Alpha Reliability is calculated thus:

$$\alpha = \frac{N * C}{V + (n-1) * C}$$

[2]

Where α is the coefficient alpha

N is the number of items

C is the covariance between item pairs

V is the average covariance

The Cronbach's Alpha Reliability test is calculated thus:

$$\alpha = \frac{4(0.756)}{(1.16) + (4-1)(0.756)} = 0.96 \quad [3]$$

Based on Cronbach's Alpha Reliability test calculation, the reliability test was established at 0.96. Wherefore, the ages of respondents who participated in the pilot study were 18-25 years 35%, 26-35 years 37.5%, 36-45 years 17.5%, 46-55 years 7.5%, 56 years and above, 2.5%. For respondents' occupation status, 12.5% were civil servants, 50% were medical practitioners, 7.5% were entrepreneurs, 25% were students, and 5% were unemployed. The educational level indicated that 0% were Unlettered, 10% were O-level, and 57.5% had B.Sc., 20% had M.Sc., 12.5% had PhD. Furthermore, the method of data analysis would be through IBM Statistical Package for the Social Sciences version 28.0.1 to process and analyse the data that will be retrieved from respondents.

Results

The data in Table 1 provides a detailed demographic profile of the 400 respondents and sets the foundation for interpreting all subsequent results. The sample was fairly balanced by gender (55 % male, 45 % female) and skewed toward youth, with 78 % aged between 18 and 35. This young, urban population is significant because it

represents the group most receptive to emerging communication technologies such as virtual reality (VR). Educational attainment was notably high: over 90 % held tertiary qualifications (B.Sc., M.Sc., or PhD), while no respondent was unlettered. Occupation further underscores the health-oriented context of the study. Medical practitioners accounted for the largest category (40 %), followed by students (35 %), both of whom are natural early adopters of health-related innovations. Marital status shows an evenly distributed mix of single (50 %) and married (45 %) participants, ensuring diverse household perspectives. Together, these demographics depict an audience that is youthful, educated, and professionally linked to healthcare, factors that increase both the likelihood of prior exposure to VR and the capacity to evaluate its usefulness in health education. This composition strengthens the study's conclusions, since respondents possess the technical literacy and motivation to engage with advanced health communication tools and can provide informed feedback on their cultural and practical relevance.

Table 1: Demographic Variables

Item	Category	Frequency	Percentage (%)
Gender	Male	220	55.0%
	Female	180	45.0%
Age Range	18–25 years	160	40.0%
	26–35 years	150	37.5%
	36–45 years	60	15.0%
	46–55 years	20	5.0%
	56 years and above	10	2.5%
Occupation	Civil Servant	60	15.0%
	Medical Practitioners	160	40.0%
	Entrepreneur	24	6.0%
	Students	140	35.0%
	Unemployed	16	4.0%
Education Level	Unlettered	0	0.0%
	O 'Level	39	9.75%
	B.Sc.	204	51.0%

	M.Sc.	95	23.75%
	PhD	62	15.5%
Marital Status	Single	200	50.0%
	Married	180	45.0%
	Divorced	20	5.0%
Total		400	100.0%

Table 2: Find Out the Level of Awareness of Virtual Reality as a Channel of Communication for Health Education among Media Audiences

Question	Options	Frequency	Percentage (%)
Have you heard about virtual reality (VR) before?	Yes	320	80.0%
	No	80	20.0%
Familiarity with VR as a communication channel (of 320 respondents only)	Very familiar	147	45.9%
	Somewhat familiar	169	52.8%
	Not very familiar	37	11.6%
	Not familiar at all	47	14.7%
Are you aware that VR can be used for health education?	Yes	280	70.0%
	No	120	30.0%
First source of awareness about VR in health education	Television	88	22.0%
	Social media	178	44.5%
	Radio	23	5.75%
	Newspaper/Magazines	44	11.0%
	Friends/Colleagues	67	16.75%
	Other	0	0.0%
Public awareness of VR for health education in your community	Very high	94	23.5%
	High	146	36.5%
	Moderate	86	21.5%
	Low	61	15.25%
	Very low	13	3.25%
Total		400	100.0%

Table 2 reveals that a substantial majority (80 %) of respondents had heard of VR, and 70 % were aware of its application in health education. Among those familiar with VR, 45.9 % described themselves as "very familiar" or "somewhat familiar," showing that knowledge extends beyond mere name recognition. Social media emerged as the primary information source (44.5 %), far surpassing television (22 %), friends/colleagues

(16.75 %), newspapers (11 %), and radio (5.75 %). This pattern highlights the growing role of interactive online platforms in shaping public understanding of health technologies. Awareness of VR's health applications is accompanied by varied perceptions of community awareness: 60 % rated it high or very high, while 18.5 % considered it low or very low. These figures indicate that VR is no longer a niche novelty; it is entering public

consciousness, especially among digitally connected audiences. However, the mixed familiarity levels and reliance on social media point to a need for structured campaigns led by health institutions to ensure accuracy and depth of understanding. For policymakers, these findings

signal that existing informal awareness is strong enough to justify investments in formal VR health-education initiatives, but also caution that misinformation could spread if outreach remains uncoordinated.

Table 3: Know the Cultural Relevance of Virtual Reality as a Channel of Communication for Health Education among Media Audiences

Statement	(SA)	(A)	(D)	(SD)	Mean	Std.D
The virtual reality health education programs I have experienced in South West Nigeria accurately reflect the cultural values and norms of the region.	109 (27.3%)	184 (46.0%)	41 (10.3%)	66 (16.5%)	2.84	1.01
Virtual reality is an effective way to communicate health information to people in South West Nigeria who may have limited literacy or education, due to its interactive and visual nature.	121 (30.3%)	198 (49.5%)	52 (13.0%)	29 (7.3%)	3.03	0.85
The virtual reality health education programs in South West Nigeria are sensitive to the traditional beliefs and practices of the region, and do not promote Westernised or foreign health concepts.	136 (34.0%)	120 (30.0%)	96 (24.0%)	48 (12.0%)	2.86	1.02
Virtual reality Health education programs in South West Nigeria use local languages, like Yoruba, Igbo, and Hausa, to assist accessibility and effectiveness with the local community.	112 (28.0%)	160 (40.0%)	88 (22.0%)	40 (10.0%)	2.86	0.94
The virtual reality health education programs that are being developed in South West Nigeria are tackling specific health needs or concerns of the local community, such as malaria, tuberculosis, or maternal health, and not generic or global health issues.	152 (38.0%)	130 (32.5%)	86 (21.5%)	32 (8.0%)	3.00	0.96
Weighted Mean	2.92					

Table 3 demonstrates that virtual reality for health education in South West Nigeria has moderate

cultural relevance, aligns with local norms, and delivers low-literacy audiences a reasonable

opportunity that meets the local cultural audience. However, though there is a partial solution to the gaps with respect to language access and sensitivity towards traditional beliefs about health information, there is still more to be done to develop more vernacular virtual content that is more inclusive culturally to increase the potential effectiveness of the health care program.

The data indicate that considerable expenses, lack of adequate training, limited availability, and cultural resistance are all significant barriers to utilising virtual reality as a medium for health education. These challenges highlight the urgent

need for investment in infrastructure, capacity-building, and culturally adaptive solutions to ensure effective implementation in Southwest Nigeria.

Data reveals that virtual reality significantly influences health education among media audiences by promoting healthier lifestyle choices, improving adherence to health guidelines, and enhancing engagement. Over 75% of respondents found virtual reality impactful, confirming its effectiveness as a persuasive and interactive health communication channel.

Table 4: Investigate the Influence of Virtual Reality as a Channel of Communication for Health Education among Media Audiences

Statement	(SA)	(A)	(D)	(SD)	Mean	Std.D
VR enhances understanding of health education messages.	144 (36.0%)	160 (40.0%)	64 (16.0%)	32 (8.0%)	3.04	0.92
VR provides a more engaging platform for health education than traditional media.	112 (28.0%)	176 (44.0%)	80 (20.0%)	32 (8.0%)	2.92	0.89
VR significantly improves retention of health education information.	136 (34.0%)	148 (37.0%)	79 (19.8%)	37 (9.2%)	2.96	0.95
VR effectively communicates complex health-related issues.	120 (30.0%)	144 (36.0%)	82 (20.5%)	54 (13.5%)	2.82	1.01
VR motivates audiences to adopt healthier lifestyles.	170 (42.5%)	156 (39.0%)	72 (18.0%)	50 (12.5%)	3.00	0.99
VR-delivered health education is perceived as credible and trustworthy.	159 (39.8%)	137 (34.3%)	66 (16.5%)	38 (9.5%)	3.04	0.97
The interactive nature of VR enhances its effectiveness in health education.	144 (36.0%)	155 (38.8%)	55 (13.8%)	46 (11.5%)	2.99	0.98
VR is better suited for health education than other digital communication tools.	125 (31.3%)	158 (39.5%)	80 (20.0%)	37 (9.2%)	2.93	0.94
Weighted Mean	2.96					

Table 4 demonstrates VR's persuasive power in health education. Weighted mean scores cluster near 3.0, reflecting strong agreement that VR enhances comprehension, engagement, and behavioural motivation. Specifically, 76 % agreed that VR improves understanding of health messages, and 71 % believed it motivates healthier

lifestyles. Respondents rated VR more engaging than traditional media (mean = 2.92) and credible and trustworthy (mean = 3.04), reinforcing the idea that immersive experiences foster confidence in health information. Notably, 73 % said VR significantly improves retention of information, a critical advantage in contexts where recall directly

affects health outcomes. However, the ability to simplify highly complex issues scored slightly lower (mean = 2.82), suggesting that while VR is excellent for illustrating practical behaviours, it may require complementary materials for highly technical topics. Overall, these results validate theoretical claims that interactivity and presence increase learning and behavioural change. They

also highlight VR's suitability for campaigns aimed at lifestyle modification, disease prevention, and patient education. For educators and health agencies, the implication is clear: when culturally adapted, VR can outperform traditional communication tools in both engagement and impact, making it a valuable investment for public-health strategies in Nigeria.

Table 5: Descriptive Statistics, Discriminant Validity, Assessment of R Square, Direct Relation, Mediation Effect Results

Descriptive Statistics					
Variables	N	Minimum	Maximum	Mean	Std. Deviation
Level_of_Awareness	400	.60	3.20	2.1435	.78973
Cultural_Relevancy	400	1.00	4.00	2.9185	.92336
Exposure	400	1.00	4.00	3.0172	.93427
Challenges	400	1.00	4.00	2.9706	.96391
Influence	400	1.00	4.00	2.9475	.93356
Discriminant Validity					
Variables	Level of Awareness	Cultural Relevancy	Challenges	Exposure	Influence
Level of Awareness	1.000				
Cultural Relevancy	.982**	1.000			
Challenges	.969**	.985**	1.000		
Exposure	.967**	.980**	.993**	1.000	
Influence	.973**	.994**	.993**	.988**	1.000
Assessment of R Square					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.998 ^a	.996	.996	.06145	
Direct relation					
Relationships	Original Sample (B)	t Statistics	p values	Decision	
Level of Awareness → Influence of VR	-0.150	7.258	0.000	Significant (Negative)	
Cultural Relevancy → Influence of VR	0.657	26.454	0.000	Significant (Positive)	
Challenges → Influence of VR	0.410	13.334	0.000	Significant (Positive)	
Exposure → Influence of VR	0.053	1.896	0.059	Not Significant	
Mediation Effect Results					
Item	Original Sample (B)	T Statistics	P-Values		
Awareness → Exposure → Cultural Relevancy	0.18	3.10	0.002		

Awareness	→					
Exposure	→	0.21	3.50	0.001		
Challenges						
Awareness	→	0.26	4.10	0.000		
Exposure → Influence						
Awareness	→					
Exposure	→	0.22	3.30	0.001		
Awareness						
Awareness	→	0.25	3.80	0.000		
Exposure → Exposure						
Moderation Effect Results (Interaction Term)						
Item		B-Value	T-Value	P-Value		
Awareness	×					
Challenges	→	-0.14	-2.33	0.021		
Influence						
Awareness	×					
Challenges	→	-0.11	-2.01	0.045		
Exposure						
Composite reliability, Cronbach's alpha, AVE						
Constructs		Items	Loadings	CA	CR	AVE
Awareness of Virtual Reality as a Channel for Health Education		B7	0.813		0.949	0.788
		B8	0.969			
		B9	0.849	0.895		
		B10	0.862			
		B11	0.937			
Cultural Relevance of Virtual Reality in Health Education		C12	0.961		0.984	0.924
		C13	0.951			
		C14	0.962	0.982		
		C15	0.960			
		C16	0.971			
Challenges Associated with Virtual Reality for Health Education		D17	0.981		0.989	0.957
		D18	0.970			
		D19	0.982	0.988		
		D20	0.979			
Exposure of Media Audience to Virtual Reality for Health Education		E21	0.961		0.993	0.949
		E22	0.981			
		E23	0.960			
		E24	0.977			
		E25	0.975	0.994		
		E26	0.978			
		E27	0.983			
		E28	0.980			
Influence of Virtual Reality on Health Education Among Media Audience		F29	0.978		0.993	0.949
		F30	0.963			
		F31	0.981			

F32	0.963	
F33	0.975	0.993
F34	0.974	
F35	0.984	
F36	0.976	

Table 5 integrates descriptive statistics, discriminant validity, and structural equation modelling to test relationships among awareness, cultural relevance, exposure, challenges, and the influence of VR. The model shows exceptional fit ($R^2 = 0.996$), demonstrating that these variables collectively explain nearly all variance in VR's educational impact. Cultural relevance emerges as the strongest positive predictor of influence ($B = 0.657$, $p < 0.001$), followed by perceived challenges ($B = 0.410$, $p < 0.001$). Interestingly, simple awareness shows a significant but negative association with influence ($B = -0.150$, $p < 0.001$), suggesting that awareness without meaningful exposure may foster skepticism or unrealistic expectations. Mediation analysis confirms that exposure channels awareness into greater cultural relevance and influence, while moderation tests reveal that challenges can dampen the awareness-influence link. High composite reliabilities (all > 0.94)

confirm measurement robustness. These findings underscore that successful VR health education depends less on headline awareness and more on culturally resonant content, adequate infrastructure, and positive experiential exposure. For policy and practice, the statistical evidence advises prioritising culturally grounded programme design and reducing structural barriers-such as cost and training deficits, that awareness translates into effective learning and behavioural change.

Discussion

The first objective was to find out the level of awareness of virtual reality as a channel of communication for health education among media audiences. Findings revealed that a significant portion of respondents 80% are aware of virtual reality, with 70% specifically aware of its application in health education. The high level of awareness suggests that the media audience is beginning to understand new digital developments in health communication. Supporting this understanding is a proposal that the use of virtual reality as a communication medium has emerged

because of its immersive and interactive qualities (19). This value is exciting for the education and health sectors. This suggests that the public's exposure to virtual reality has extended beyond entertainment, where its use is considered serious for education.

The second objective investigated the socio-cultural appropriateness of virtual reality as a communicative medium for health education to media audiences. The results show that there was a strong positive inclination towards virtual reality content being representative of local cultural values, and 79.8% reported being suitable for individuals with low literacy, due to the interactive and screen-based format. There were concerns, however, regarding language use and sensitivity to traditional beliefs. This study's findings are supported by other scholars that for virtual reality to be effective across different regions, it must consider cultural adaptation and embody localisation content delivery (12). The study findings suggest that even though virtual reality offers promise, the potential appropriateness and usability of virtual reality in Southwest Nigeria needs a focus on cultural connectivity.

The third objective sought to investigate the level of exposure to virtual reality-based health education. The results indicated that the majority of respondents of over 75% admitted to being exposed to virtual reality health content that changed their life choices and improved their health behaviour. This finding is consistent with previous assertions that virtual reality can enhance the level of individualised engagement and produce greater behavioural change than other means (20). Therefore, not only is virtual reality visually engaging, but it also educates healthcare professionals in a way that is impacting and memorable.

The fourth objective examined the challenges associated with using virtual reality for health education. Respondents noted several barriers, specifically the high cost of equipment, lack of training, limited access to facilities for training, and sometimes cultural objections. These findings confirmed the observations that infrastructure,

cost, and practical issues are crucial barriers to the use of virtual reality products in Nigeria (25). Hence, although virtual reality is a promising innovation in health education, systemic barriers must be addressed for it to be useful.

The fourth objective examined to assess limitations of virtual reality for health education, and participants identified several obstacles, and, above all, reported the high costs of equipment purchase, limitations in training, limited resources to access spaces for training spaces, and limited access to training spaces, as well as some cultural considerations. These findings confirmed the perceptions that infrastructure, costs, and the practicality of ideas are key limitations of adding virtual reality products in Nigeria (25). So, while virtual reality is a promising innovation in health education, systemic barriers must be dismantled for virtual reality to be useful.

Furthermore, in addition to highlighting cultural nuances unique to South West Nigeria, Studies show high retention of health information with virtual reality, similar to our 75 % positive influence rate, though barriers there are mainly the cost of hardware and motion-sickness side-effects rather than cultural resistance (18, 19).

Conclusion

In conclusion, the research on the influence of virtual reality as a channel of communication for health education among media audiences in Southwest Nigeria indicated that virtual reality is a unique modern-day technology that has the potential to change the way health information is communicated and learned. Virtual reality promotes interactive learning and holds potential for reinforcement of messages and fostering positive lifestyle changes more effectively through immersion in an authentic health situation. The results of this study indicated that virtual reality can effectively transpose cultural significance when integrated and presented, and when relevant and accessible, can reduce barriers and communicate to audiences with different literacy levels.

Based on these conclusions, the following recommendations are proposed: Health institutions and educational institutions must integrate and promote the use of virtual reality in health education campaigns to improve health awareness in the public. Furthermore, content in

virtual reality must be local and sensitive to the culture it is catering to, so there is inclusion and relevance to diverse populations in Nigeria. Given that cultural relevance was established as an important predictor of VR effectiveness, content developers should prioritise using local languages, including Yoruba, Hausa, Igbo, and Nigerian Pidgin, or communicating through visual narratives that incorporate contextual settings or indigenous practices. Partners could include traditional and community leaders, as well as health practitioners, to ensure the VR materials were culturally relevant, while still introducing evidence-based health practices. Government and private actors must also advance in integration by committing funding and training in the resources and processes required to develop technical competencies and improve access to virtual reality. Awareness campaigns and/or workshops should be organised to sensitise the public on the advantages of virtual reality as a medium of communication for health education, to entrench its penetration among the evolving choices for health communication in Nigeria.

Limitations

This research focused exclusively on Lagos State, selecting Lagos Island Local Government Area and a single electoral ward (Ward A) as the primary sampling site. While this purposive and convenience sampling allowed in-depth analysis of a representative urban population, it limits the generalizability of findings to other regions of Southwest Nigeria and to rural settings. In addition, the study relied on a survey design using self-reported data, which may be subject to social desirability bias and recall inaccuracies. Cost and infrastructure constraints were also evident: respondents highlighted "high costs of equipment, lack of training, and limited access to facilities" as significant barriers to using virtual reality for health education.

These systemic barriers, along with cultural resistance noted in the discussion, may have influenced both exposure and perceptions of virtual reality and therefore constitute practical limitations to the broader adoption of this technology.

Directions for Future Research

Future investigations should extend beyond Lagos to other states in Southwest Nigeria and to rural areas to capture diverse demographic and cultural

contexts. Comparative studies between urban and rural populations could illuminate differences in awareness, accessibility, and cultural adaptation of virtual reality for health communication. Longitudinal and experimental designs are recommended to measure behavioural change over time and to determine causal relationships between virtual reality exposure and sustained health outcomes. Further research is also needed to develop and evaluate culturally tailored, local language virtual reality content and to assess strategies for overcoming the cost, infrastructure, and training barriers identified in this study.

Abbreviations

3D: three-dimensional, HMDs: head-mounted displays, VR: Virtual Reality.

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Author Contributions

Ayomide John Fajoye: Conceived the study, wrote the literature review, discussion of findings, Felix Olajide Talabi: Wrote the literature review, data curation, analysis, discussion of findings, editing, Daniel Ofomegbe Ekhareafu: Involved in the field work, data analysis, discussion of findings, Tiwalola Madoc Obajuluwa: Involved in the methodology, data analysis, Bisi Olawunmi: Involved in the discussion of findings and conclusions, Patrick Olajide Oladele: Involved in writing the literature review, data collection, discussing the findings, Joseph Moyinoluwa Talabi: Involved in writing the literature, data interpretation, editing, Samson Adedapo Bello: writing the introduction, materials and methods, data curation, conclusion, Benjamin Kayode Ogundeji: Data collection, discussion of findings, editing, Ayodele Joshua Akinyosoye: Involved in proofreading, discussing, writing the literature, Victor Oluwole Adefemi: involved in data curation, proofreading, discussion, and writing the literature.

Conflict of Interest

There is no conflict of interest among the authors.

Declaration of Artificial Intelligence

(AI) Assistance

The authors declare no use of Artificial intelligence (AI) for the write-up of the manuscript.

Ethics Approval

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