Original Article

Perceptions of Primary Healthcare Workers on In-person versus Virtual Skills Acquisition Training on Primary Ear and Hearing Care

[1,2]A.A. Adeyemo, [3]L. Biagio-De Jager

1. Department of Otorhinolaryngology, University College Hospital, Ibadan, Nigeria
2. Institute of Child Health, College of Medicine, University of Ibadan, Ibadan, Nigeria
3. Department of Speech, Language Pathology and Audiology, University of Pretoria, South Africa

Abstract

Background: Due to demands for innovative solutions for training health care workers, virtual training has gained popularity offering distinct advantages over traditional in-person learning. However, there is no assessment yet of the effectiveness of virtual training in Primary Health Care (PEHC). This study evaluated perceptions of effectiveness and impact from participants trained on the PEHC manual using both in-person and virtual training formats.

Materials and Methods: This qualitative study utilized Focus Group Discussions and semi-structured interviews to gather insights from Primary Health Care Workers (PHCWs) from six Local Government Areas in Oyo State, Nigeria. Using a multistage cluster sampling technique, 134 respondents were selected to participate in either virtual or in-person training. The data was transcribed and analyzed using thematic analysis with Atlas TI software.

Results: Five themes emerged from the study (Knowledge Acquired, Skills acquired, Preferences, Challenges, Recommendation). Participants in both training formats acknowledged that the training significantly improved their knowledge and practical skills in ear care, and they now feel equipped to handle cases of ear and hearing lesions. Though there was a predominant preference for in-person training format, some participants suggested increased use of virtual training to reach more PHCWs who were unable to participate in in-person training sessions. While in-person training participants complained of traveling long distances and accommodation challenges, virtual training participants complained mostly of the technical glitches and loss of attention.

Conclusion /Recommendations: Both in-person and virtual training formats were equally effective in training PHCWs. Despite the challenges identified in both training formats, integration of both trainings formats, with optimization of the virtual training format can provide a more comprehensive approach to professional development of primary healthcare workers.

Keywords: Virtual Training, In-person training, Primary Ear and Hearing Care, Primary Health Care.

Introduction

Hearing impairment is one of the most common disabilities in the world, 1.5 billion people (nearly 20% of the world's population) experience hearing loss.[1] According to the World Health Organization (WHO), 432 million people are afflicted with disabling hearing impairment worldwide, this figure is projected to increase to 700 million people by 2050.[1]

Correspondence to:

Dr. Adebolajo A. Adeyemo
Institute of Child Heath, College of Medicine, University of Ibadan,
PMB 5017 GPO Ibadan, Oyo State, Nigeria
E-mail: adebolajo@gmail.com
https://orcid.org/0000-0002-7486-5758.

Despite this fact, hearing loss is rarely appraised, nor prioritized in resource-limited and low-income economies such as Nigeria.[2] Access to health services, including ear and hearing care, remains a critical gap in many health systems, including in Nigeria.[2] In many low- and middle-income countries (LMICs), Primary Health Care (PHC) is the main strategy to achieve equitable, comprehensive, patient- and community-oriented approach to achieving Universal Health Coverage.[3]

Unfortunately, Primary Healthcare Workers (PHCWs) tend to have limited knowledge about non-communicable diseases such as hearing loss.[4] This can lead to lack of trust in the capacity of PHCWs, and may become an obstacle for PHCWs to act effectively as frontline workers in the healthcare delivery system.[5]

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Though the importance of PHCWs in the management of Ear and Hearing disorders have been demonstrated,[6] Primary Ear and Hearing Care (PEHC) is not included in the training curriculum of PHCWs in several countries. Management of patients by untrained personnel may lead to treatment complications. Therefore, in 2023, the WHO re-launched the PEHC training manual in an effort to address the burden of hearing loss, through enhancing awareness, improving access to care, and integrating ear and hearing health into universal health coverage.[1,6] The goal is to improve the delivery of efficient interventions for Ear and Hearing disorders at the primary level of care through PHCWs. [3,4]

Training and re-training PHCWs comes with multiple challenges, necessitating an increasing need for more effective and innovative solutions. Virtual training courses have become widely popular, providing significant advantages over conventional in-person learning formats.[7] Virtual training offers significant potential for delivering standardized training remotely, it is an effective alternative to traditional learning for training PHCWs in remote and resource-poor settings.[8]

Despite the evidence of efficacy and increasing use of virtual training, its use in PEHC training has not been fully explored. Hence, the purpose of this study was to compare the perceptions of effectiveness and impact among participants of in-person training and virtual training on the PEHC manual.

Materials and Methods

This qualitative study employed the use of Focus Group Discussions (FGDs) and semi-structured interviews to explore the view of PHCWs in Oyo State, Nigeria. A multistage cluster sampling technique was used to select the PHCWs: three health zones out of the six health zones in the state were selected (Oyo, Oke-Ogun, and Ibadan health zones). All the LGAs in the selected health zones were stratified into semi-rural and urban; three semi-rural LGAs and three urban LGAs were then selected randomly from each group. In each selected LGA, PHCWs were randomly selected for in-person and virtual training format. Both training formats had equal number of invited participants from each LGA. The in-person training included 76 participants (25 Senior Community Health Extension Workers (CHEWs), 35 Community Health Officers (CHOs), 14 Nurses, and 1 Doctor). The virtual training included 58 participants (24 Senior CHEWs, 20 CHOs, 14 Nurses, and 1Doctor). Three FGDs were held in each cohort. Twelve FGDs and 124 semi-structured interviews were conducted among PHCWs from the six selected LGAs. The FGDs were conducted in English language and transcribed verbatim. Each FGD lasted for approximately 40 minutes with the moderator allowing the discussion to come to a natural close. Interview guides made up of semi-structured open ended questions were used to conduct the interviews and FGD. Two trainers from the University of Ibadan and the University of Pretoria trained the participants using the WHO's PEHC Trainer Handbook. The first trainer provided in person training, while the virtual training sessions were recorded in South Africa and training was completed asynchronously, with synchronous question and answer sessions at intervals.

Data management and analysis.

The data was compiled, and the recordings transcribed, and checked for accuracy, then exported and saved into Atlas TI version 8 qualitative analysis software. Thematic analysis was done by reading through the transcript repeatedly by two research assistants independently. Codes were vetted and checked for consistency. Inductive thematic analysis was used to analyze the study findings.

Results

Using Inductive thematic analysis, the following themes were identified: knowledge acquired, skills acquired, preferences. challenges, and recommendations

Theme One: Knowledge Acquired Through the Training

Several participants reported on how the training impacted their knowledge and helped in building confidence in the treatment of Ear and Hearing lesions. Participants received exposure to common practices harmful to the ear and hearing; they also gained knowledge on various aspects of ear care, diagnosis, and treatment of ear impairments.

Knowledge of history taking and ear examination:

P124: FCEQ35. "I learnt how to take history ..., ear examination, diagnosis of ear diseases, dry mopping of ear discharge, and treatment of ear disease and ear syringing of foreign body in the ear"

P122: FCEQ33. "How to prevent ear disease and reassure the patient, taking history of the patient [and] referring to the appropriate channel"

Knowledge of harmful practices:

P73: FUKJ1F28 "I [learnt] a lot about the harmful practices of ear treatment"

P109: FCEQ21. "Prevention of hearing loss and ... treatment of ear diseases and the lectures helped me to know that gentamycin injection can cause ear damage"

Improved knowledge of ear care

P90: FGD AFIJIO 1 "[What] influenced me most ... was how [to] care for children's ears.

P203: FGD 1.2. Speaker C: "I learnt a lot of things, on how to clean and how to treat the ear and how to examine the ear, how to detect ... impairment in children and how to educate ... pregnant women and discourage them to take [just] any drug ... because it [could] affect their fetus.

P183:SCEQ29."Yes, the dry mopping. The infected ear of the patient will be examined with the use of otoscope ... detecting foreign body or impacted wax. The pinna is raised ... and the tissue paper is rolled into the ear and later [brought] out…"

P91.FGD1.1 "It [added] a lot to [me]... In the area of history taking. In the area of examination, use of the instrument for examination. In the area of categorizing the grade of the aliment. In terms of the management, [when] to refer."

Theme Two: Skills acquired during the training

Participants from both training formats reported increased confidence in examining and managing ear problems in children. They expressed ability to treat ear impairments independently, rather than their previous sole practice of referrals to secondary hospitals. This shift reflects the positive impact of the training on their skills. The participants also acknowledged the acquired ability to identify and treat patients with otitis media and other complications related to the outer ear.

P*177:SCEQ23."Yes, from the training that I have received, now I can treat patient with ear problems and ...[hearing] impairment*

P90: FGD AFIJIO. ***"****The experience I have [in] 3 cases: earwax impaction that we oiled, the person was relieved and on the third day the wax came out... They started appreciating us that in our community we can handle ear problems ... Also, children with [ear] infection, we recommend antibiotics ... Then for people with hearing impairment we let them know if they go for tests… they can [get improvement] with hearing aid. These made us to give necessary treatment ... at primary health care level."*

P95:Oyo.East "*We sensitize the community in the types of drug they should [use] and which ones they should not [use], ...the mothers we ...sensitize them to take their immunization properly and accurately"*

P112: FCEQ24 "It has created in me confidence to handle any care of hearing problem."

Theme Three: Preferences

The participants exhibited diverse views regarding their preference between the two training formats. Majority of the participants favored in-person classes, as they perceived them to be more effective and engaging, whereas the virtual training is seen mostly as monotonous and less engaging.

Preference for In-person Training

Most participants expressed a strong preference for in-person training, recognizing its effectiveness due to the opportunity for one-on-one interaction with the instructor. They noted that this personal engagement was often lacking in virtual classes. Participants also raised concerns about technical issues, such as network glitches and the tutor's accent, which impacted their learning experience. While acknowledging that in-person training demands complete concentration, they highlighted that virtual training allows for distractions, as participants can attend from various locations. As such there is high tendency to multitask during virtual sessions which could hinder their ability to focus fully on the material being presented.

P203: FGD 1.2 *"[in-person] training is very important because, [in] virtual training there might be network problem at times and you may not be able to understand it the way you understand [in-person training] . Because here we can see ourselves, we can ask questions, if something is not clear we can go and meet the person [but] if it is virtual training, you cannot go and meet the person personally*"

P90: FGD AFIJIO *"When we came for the training, we are happy with the interaction between us and our lecturers. Professor taught us like a primary school student. He handled it systematically and step-by-step and we gained a lot. And we students had get-together with our colleagues that have not be in contact with for a long period of time."*

P95: FGD. Oyo East 1*"I prefer [in-person] because when you see [the instructor] that is teaching you, you will be able to remember. I don't like reading on my phone, I will still write it out before reading it, so I prefer [in-person], it's very [good] for me. I prefer [in-person] because there will be room for questions and answers, you will be able to reason with [the instructor], ... that's why I prefer [in-person]"*

P94: Iseyin_FGD 1*"The teaching was boring, you know we are hearing somebody speaking to us but if that person is in front or we are physically seeing that person with us, it may not be boring. At first instance we like the training but when the training [continued to 3 or 4 hours] everybody [became] bored. So, we prefer to do the [in-person] than the virtual [training]"*

P90: FGD AFIJIO **"***The reason I like [in-person] training is because the center that I am working presently is Afijio, it is a rural area with no network sometimes and being virtual I cannot join the [training]. We only have [wireless signals] when a person goes to towns like Iware to Jobele. That is the reason I prefer [in-person] rather than [virtual]"*

P203: FGD 1.2 "*The only advantage that virtual training has over [in-person] training is that you can sit at the comfort of our home, it doesn't require movement from one place to another so that's the advantage but I still prefer [in-person] training because of the inter personal relationship with the facilitator*"

Preference For Virtual Training:

Some participants expressed preferences for virtual training especially when there is shortage of staff in PHC facilities, they consider virtual training as a way of reaching a large number of health workers without risking lives through traveling long distances for in-person training.

P202: FGD 1.1 *It is okay because this avenue will reach lots of health workers. The lectures will be able to reach many health workers***.**

P202: FGD 1.1 *"I prefer virtual. It reduces the stress. I use to come every day from Iseyin"*

P202: FGD **"***If the training is virtual it will help a lot. Especially [at] this time that we have shortage of staff. We ... the health workers left our health facilities, [our presence here]now is affecting the service there. And the prevention of traveling ... I am from Kajola LG, it is very far from this place."*

Theme Four: Challenges

Major challenges of Virtual Training

Participants complained that mobile network issues, and limited interaction distorted virtual training. They also commented that the short time frame hindered practical learning, and they cited loss of attention and poor communication as the major concerns during the virtual sessions

9*1: FGD IBADAN. "Those of us that did virtual training, we didn't hear the [tutor] very well and [network connection] was not good. We were not able to ask questions, [in-person] training would have been better. We will be able to see ourselves and communicate"*

P188: SCEQ45. "The time frame is [short] it should be at least a week or more for practical and procedures Network problem occurred during the virtual class"

Challenges of In-person Training.

The major challenges of in-person training mentioned by the participants are requirements to travel long distances, congested seating

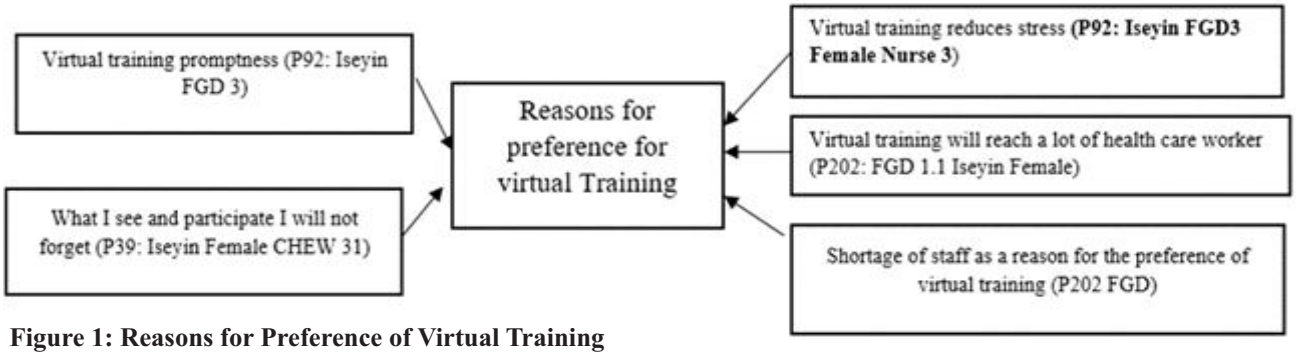

Figure 1: Reasons for Preference of Virtual Training

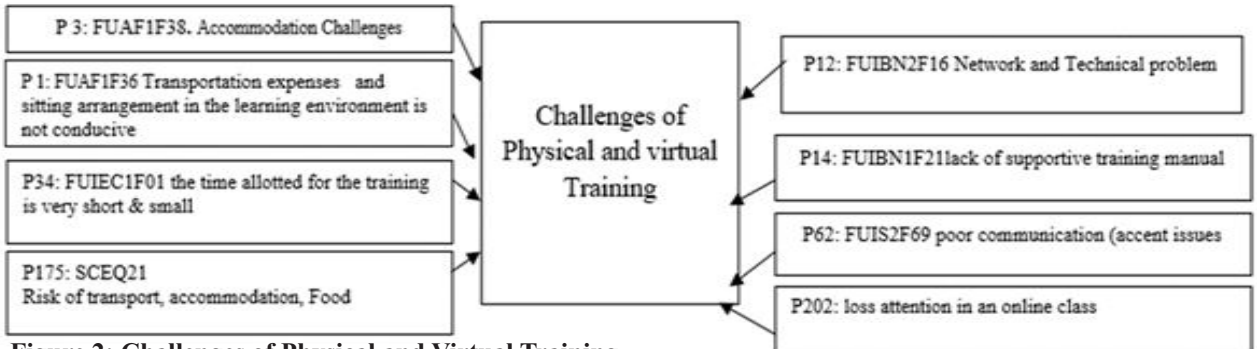

Figure 2: Challenges of Physical and Virtual Training

arrangement, and sitting arrangement time constraints and logistics issues.

P1: FUAF1F36 "Transportation expenses and sitting arrangements in the learning environment is not conducive"

Theme Five: Recommendations

The participants recommended that training should be decentralized; refresher courses should be provided to maintain skills and knowledge. Incorporation of practical sessions simultaneously with theoretical training was advocated for better understanding and application of skills acquired.

P74: FUKJ1F29 "There is need for retraining and more practical sessions to guide us more [so that we can be] more competent"

P 6: FUAF1F43."There should be on job training, [and] decentralization of the training into smaller groups, there should be designated clinic at the primary level to refer to"

Discussion

Despite the growing acceptance of virtual training and the distinct advantages it has over conventional in-person learning, the effectiveness of virtual training compared to in-person training in PEHC has not yet been assessed. The current study therefore aimed to explore the perceptions of effectiveness and impact among participants of in-person training and virtual training on the PEHC manual.

The study showed that training brought significant improvements in participants' knowledge and practical skills. The participants reported enhanced understanding of ear anatomy, common diseases, and treatment modalities, especially the use of an otoscope for accurate otologic diagnosis. Many participants expressed newfound confidence in performing procedures such as ear syringing and ear wax removal. The practical exercises experienced were acknowledged as effective, an observation more espoused by those that attended the in-person training session. Though members of both cohorts felt better equipped to handle ear-related cases in primary health facilities. This showed that regardless of the training format, knowledge acquisition and uptake seem adequate, confirming reports from other studies that compared skill acquisition between virtual and in-person training formats.[9]

The outcome of this study showed that PHCWs believe that both virtual and in-person training is equally important, similar to prior research outputs on the effect of virtual and in-person training.[10] Observations were expressed about the PHCWs who did not attend the training, the participants opined that utilizing virtual training will enable PHCWs not present to participate in the training thereby reaching a greater number of healthcare workers. Moreover, virtual training will not require PHCWs to abandon their health facility to attend the training unlike in-person training. Thus, virtual training can enable training of larger population of PHCWs with minimal disruption to job schedule.[11]

Virtual learning has significant advantages over conventional in-person learning approaches[7]. A study by Melo et al compared the effectiveness of a training program for PHCWs using in person and virtual training methods[12]. Although both groups presented statistically significant different pre and post training scores, for PHCW who were physically present during the training program, this difference was higher, suggesting that virtual training is an effective training tool for child hearing health for PHCW[12].

Virtual training could be optimized for a better outcome by making the training materials available as downloadable files to provide a more lasting and effective learning experience. This may also enhance knowledge retention, allowing participants to self-pace the learning and re-learning. Through ensuring that a greater proportion of PHCWs can be trained without the need for travel, virtual training helps to conserve available human resources in health facilities. Thus, virtual training may be a potent tool for health education and reduction of the global shortage of healthcare workers[13]. This resonates loudly in many African countries including Nigeria, currently experiencing a shortage of personnel in primary healthcare centers, [14] Virtual training is perceived to address a significant gap in training accessibility by enabling health workers to participate in trainings without disrupting operations of health facilities.[14]

Previous research has yielded mixed preferences. University students preferred virtual training[15] while PHCW preferred in-person training and scored higher when training in-person[12]. The current study sample of PHCWs preferred in-person training over the virtual option. These participants noted that in-person sessions were easier to recall, more interactive, and free from technical issues such as network disruptions and power outages. Participants from rural communities highlighted that poor internet access and unreliable electricity make virtual training challenging. While they acknowledged the impact of virtual training, they believed it would be more effective if conducted in person[15].

A significant yet understated reason why participants might prefer in-person training over virtual training is

the motivation to travel for the experience, as well as the hospitality and networking opportunities it offers. Some participants suggest that in-person training facilitates social interaction, which they find enjoyable and important. They appreciate the opportunity to meet with colleagues with whom they have had prior relationships—an aspect that is lacking in virtual training. This aligns with Mueller's assertion that virtual training could be more successful if similar avenues for networking and engagement were provided as viable alternatives[16]. Participants expressed concerns about the efficiency of question-and-answer sessions during virtual training. They surmised that attention is often lost during virtual training and virtual trainings permits multitasking that diminishes knowledge acquisition[15].

There are several challenges associated with both virtual and in-person training. In-person training often requires accommodation and travel logistics that planners must manage. The stress and risks of traveling back and forth for in-person training can be significant, therefore, it was advocated to conduct training in individual PHC facilities.[13] However, this individual approach is both capital-intensive and time-consuming. In contrast, virtual training has distinct advantages in this regard. Virtual training can be designed to accommodate participants schedules, it can be pre-recorded, and the same recording can be used to conduct multiple training sessions[14]. In contrast, as the length of the virtual training increases, participants reported that the training became boring, an observation echoed by previous research [15]. Thus, virtual training should include engaging content to discourage disengagement, and should incorporate breaks and other activities that can enhance the overall experience. Participants' perceptions of the trainer during virtual sessions are crucial, factors such as use of a trainer with a local accent, clarity of expression, and the use of relatable illustrations can significantly impact engagement.

Conclusion

The study showed that both in-person and virtual training formats were perceived as equally effective in enhancing the knowledge and clinical skills of PHCWs, though there was a predominant preference for the in-person training format. In-person training offers valuable networking opportunities, while virtual training has the potential to reach a broader audience, allowing more PHCWs to benefit from essential skill development. Virtual platforms, can be leveraged to expand accessibility and inclusivity in healthcare training programs. Emphasizing the strengths of both training modalities can lead to a more comprehensive approach to professional development.

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Conflict of Interest

The authors declare no conflict of interest

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