

# Maintenance of knowledge acquired by community health workers on hearing health topics: A remote teaching approach

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## ABSTRACT

**Purpose:** to measure the maintenance of knowledge acquired by community health workers about hearing health and check whether it was associated with their age group, education level, and length of service.

**Methods:** an experimental study, in which 30 community health workers participated in four remote meetings. In the first one, data were collected on their age, education level, and length of service. The second and third meetings had educational actions on 1) hearing, 2) hearing health and impairment, 3) organization of Hearing Healthcare Services, 4) hearing aid use and hygiene, and 5) the importance of follow-up visits; also, the immediate post-training quiz was applied. The late post-training quiz was administered in the fourth meeting. Each quiz had 10 problem situations. Knowledge maintenance was measured by comparing the scores of correct answers. Moreover, the participants' performances were associated with the variables. The data underwent McNemar, Binomial, and Fisher's exact statistical tests, setting the significance level at 5%.

**Results:** there was no difference in correct answers between the quizzes and knowledge maintenance was not related to the variables.

**Conclusion:** the community health workers maintained the acquired knowledge for months after the educational actions, regardless of their age group, education level, or length of service.

**Keywords:** Hearing; Community Health Workers; Health Education; Public Health

A study conducted at the Universidade Federal de Santa Maria - UFSM, Santa Maria, Rio Grande do Sul, Brazil.

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## INTRODUCTION

Hearing loss is an increasingly present and debated topic worldwide because it negatively impacts the subjects' interpersonal communication, psychosocial well-being, quality of life, and economic independence, regardless of age<sup>1</sup>.

According to a report on hearing by the World Health Organization (WHO), 1.5 billion people currently live with some degree of hearing loss, and by 2050 it is estimated that 2.5 billion people will be affected<sup>2</sup>. According to the National Health Survey data, 2.3 million people in Brazil have hearing loss (1.1%), a figure that increases proportionally with increasing age, reaching 5.4% of the population aged 65 years or older<sup>3</sup>.

The Brazilian Ministry of Health established the National Hearing Healthcare Policy (PNASA) in 2004 to mitigate the effects of hearing loss and provide comprehensive assistance for an indefinite period at the three healthcare levels, with actions aimed at prevention, diagnosis, intervention, and treatment of hearing loss<sup>4</sup>. In 2012, Ministry Regulation no. 587 (which had created the State Hearing Healthcare Networks) was revoked by Regulation no. 793, establishing the Care Network for People with Disabilities within the Public Health System (SUS, in Portuguese), thus creating, expanding, and articulating healthcare centers for people with hearing loss. One of its planning guidelines is to promote continuing education strategies<sup>5</sup>, which is also strengthened by what is recommended in the National Primary Healthcare Policy (PNAB)<sup>6</sup>.

Community health workers (CHW) are the basis of the Family Health Strategy and were established in the service for health promotion and prevention, focusing on health education activities in homes and communities, expanding the population's access to health actions and services<sup>7</sup>.

Hence, these professionals may become allies in detecting hearing changes, making relevant referrals, and reincluding hearing aid (HA) users who have not attended follow-up appointments. The information they convey must be accurate and easy to understand and, therefore, they must be continuously updated and trained so they can effectively meet the needs of different users<sup>8,9</sup>, as they are responsible for providing health education to the population<sup>10</sup>.

Because knowledge must be as widespread as possible, remote education stands out as an alternative that enables the adherence of more professionals in different locations, without any need for

traveling. Furthermore, it has been demonstrated that the dissemination of knowledge through this modality, although it was already being used for many years, was strengthened during the COVID-19 pandemic and has proven to be effective<sup>11</sup>.

It is appropriate to not only promote education but also measure the effectiveness of such actions, understand how much knowledge was acquired during the training, and how much was retained in the long run. Several studies have assessed the effectiveness of educational actions immediately after they were carried out<sup>9,12-15</sup>. However, the literature lacks research to verify the constancy of knowledge months after the actions.

Thus, this study is justified by the importance of evaluating the long-term effectiveness of remote educational actions on hearing and hearing health for CHWs. It aimed to measure the maintenance of knowledge on hearing health acquired by CHWs and verify whether it was associated with their age group, education level, and length of service.

## METHODS

This quantitative experimental research<sup>16</sup> was conducted with CHW of Santa Maria, Rio Grande do Sul, having been approved by the Human Research Ethics Committee of the Universidade Federal de Santa Maria, RS, Brazil, under no. 4.847.070 and CAAE no. 48120921.1.0000.5346.

The study sample was selected by convenience, respecting the following eligibility criteria: CHWs who were active from August 2021 to March 2022, participated in all educational actions proposed during this period, logged in individually, and agreed to participate by signing an informed consent form. Professionals who did not respond to the two evaluation quizzes were excluded from the research.

A total of 74 CHWs participated in at least one of the meetings held in the said actions. Based on the eligibility criteria, the sample comprised 30 of these CHWs who worked in different regions of Santa Maria.

They were recruited via the Continuing Health Education Center (NEPeS, in Portuguese) and the Primary Healthcare Superintendency of that municipality, which approved the feasibility of the study and the professionals' participation and first disseminated the research to them.

## Procedures

Four previously scheduled synchronous remote meetings were held, lasting approximately 2 hours, in August, September, and October/2021, and March/2022, in Google Meet.

The study objective and proposal were presented at the first meeting when the informed consent form was also read and signed by the CHWs who agreed to participate in the research. In addition, data were collected regarding their age, length of service, and education level, also verifying their previous knowledge about the topics approached in educational actions – which, however, was not addressed in this study.

The second and third meetings comprised educational activities, addressing the following topics: hearing (topic 1), hearing health and impairment (topic 2), organization and functioning of Hearing Healthcare Services (SASA, in Portuguese) (topic 3), notions about HA use, handling, and cleaning (topic 4), and the importance of users' follow-up at SASA (topic 5). Topics 1 and 2 were addressed in the second meeting, and topics 3, 4, and 5 in the third one.

All topics were approached with an active teaching methodology to help them construct knowledge effectively and collaboratively by being protagonists of their training through quizzes with problem situations. Problematization is on the list of active methodologies on Paulo Freire's theoretical assumptions and the critical-social content pedagogy<sup>17</sup>. In this method, participants discuss adversities arising from the observation of reality, causing them to seek solutions that help them transform it. Meanwhile, they are also transformed as they problematize and reflect on the problem, begin to detect new adversities, and seek further changes<sup>18</sup>.

The actions also used support teaching materials created on digital graphic design platforms with illustrations and diagrams to help CHWs understand the topic.

Their knowledge about such topics immediately after the actions was collected through a quiz with 10 problem situations (two on each topic), prepared and applied via interactive Google Forms (immediate post-training quiz) (Figure 1). All problem situations covered circumstances familiar to the professionals' daily lives and were written in simple and accessible language, with four answer options each.

3) In a visit to 32-year-old Paula's home, she reported noticing that her hearing worsened since her last pregnancy 18 months before. She reports having the sensation of clogged ears and hearing her own voice as if it were "inside her head", along with constant hissing in both ears. She also says that she hears better in noisy environments, understands well what people say when they speak "louder", watches TV quite loudly, and is not sensitive to intense sounds. The greatest complaint Paula hears from other people is that she speaks "too low". Concerning this report, check the correct answer.

- a) Paula possibly has severe hearing loss because other people need to speak loudly to her, and she watches TV quite loudly.
- b) She likely has a hearing loss that influences sound conduction because she reported "hearing well her own voice, as if it were inside her head" and had no difficulties with more intense sounds. She also speaks at a low intensity ("too low"), precisely because she hears herself well.
- c) Paula must be instructed to take extra care of her hearing health, especially regarding ear hygiene. Therefore, the procedure is to instruct her to use cotton swabs regularly.
- d) Paula and her family must be taught communication strategies, such as orofacial reading and watching TV with subtitles, to mitigate their complaints.

Source: The authors

**Figure 1.** Model of a problem situation used in the immediate post-training quiz

The fourth meeting was held 6 months after the educational actions on topics 1 and 2 and 5 months after the training on topics 3, 4, and 5 to measure knowledge maintenance. Hence, another quiz was applied with 10 problem situations different from those

in the first evaluation quiz, although with the same approach and equivalent level of difficulty, prepared by the same researchers (late post-training quiz) (Figure 2), and likewise designed and applied on Google Forms.

3) In a home visit to a 28-year-old man, he reports to you he noticed having to ask people to speak more loudly to him and watching TV too loudly. However, he hears his voice quite loudly “inside his head”, and his relatives point out that he has been speaking too low. He reports not having much difficulty hearing his friends in noisy environments, such as soccer games, because they end up speaking more loudly. Check the option that indicates what may be happening in this case.

- a) This man certainly has a hearing loss related to his inner ear where the cochlea is – the organ with auditory cells. That is why people have to speak more loudly to him.
- b) The man in this case probably has a hearing loss that influences sound conduction (conductive loss), directly impacting sound processing in the brain.
- c) The man certainly has difficulties with his hearing skills, which are responsible for understanding sounds in their path to the brain.
- d) The man in this case probably has a hearing loss that influences sound conduction (conductive hearing loss), in which he feels his ears clogged, making it easier for him to hear his own sounds (e.g., his voice). He also finds it easy to hear in noise and places where people speak more loudly, overcoming the barrier imposed by this type of loss.

Source: The authors

**Figure 2.** Model of a problem situation used in the late post-training quiz

The researchers provided the links to the quizzes via Google Meet, and the professionals were instructed to access them individually through their electronic devices.

One of the researchers presented the problem situations orally during the meeting to ensure that the CHWs adequately understood them and that data were collected reliably.

## Data analysis

The data collected through the immediate and late post-training quizzes were transferred to an Excel spreadsheet and subjected to statistical tests to measure whether the CHWs' knowledge of the topics covered in the educational actions was maintained months after they had taken place and whether their

performance was associated with their age group, education level, and length of service.

The scores of correct answers in the immediate and late post-training quizzes were compared using the McNemar test to assess whether they had maintained the knowledge acquired.

An intrasubject analysis was also performed to classify the CHWs' late post-training knowledge in comparison with immediate post-training, as follows: maintenance: when the individual got the same problem situation right in the immediate and late post-training quizzes; failure: when they got the same question wrong in the immediate and late post-training quizzes; progression: when they got a certain problem situation wrong in the immediate post-training quiz but got it right in the late post-training quiz; regression: when

the participant got a question right in the immediate post-training quiz but got the same question wrong in the late post-training quiz. After classifying each participant's performance in all problem situations, the "maintenance" performance was compared with the other classifications to determine which condition was prevalent in the study sample and whether the "maintenance" performance was significantly different from the other conditions. These analyses were performed with the binomial test.

Furthermore, performances were associated with age group, education level, and length of service. To analyze age groups, the sample was divided into the following ones: 29 to 39 years old, 40 to 49 years old, and over 50 years old. Professionals were divided into high school graduates and those with a bachelor's degree to analyze their education level. To analyze the length of service, the sample was divided into less than 10 years, from 10 to 15 years, and over 15 years. The association analysis was performed with Fisher's exact test.

The significance level for all statistical tests was set at 5% ( $p$ -value < 0.05), and the analyses were performed using SPSS, v. 21, BioEstat, v. 5.3, and Excel, v. 2312.

As the evaluation quizzes had two questions on each topic, the total per topic was 60 answers.

## RESULTS

A total of 74 CHWs participated in at least one of the meetings, of which 44 were excluded for not meeting the eligibility criteria. Thus, the study sample comprised 30 CHWs – 26 females (86.7%) and four males (13.3%), with a mean age of 47.7 years – who worked in different regions of Santa Maria.

The comparison between the scores of correct answers in the immediate and late post-training quizzes did not reveal any differences in the five topics approached, inferring the premise that such knowledge was maintained 5 to 6 months after the educational actions (Table 1).

Moreover, the intra-subject analysis showed that the knowledge maintenance score stood out from the other performances in all topics covered (Table 2).

No statistical difference was found in the association analysis between the CHWs' performances months after the educational actions and their age group, education level, or length of service. In other words, knowledge was maintained months after the educational actions regardless of age, education level, or length of service of the professionals in the sample (Tables 3, 4, and 5).

**Table 1.** Comparison of the scores of correct answers in the immediate and late post-training quizzes per topic approached in the educational actions

Topics	Number of correct answers in the post-training quizzes				p-value
	Immediate		Late		
	n	%	n	%	
Hearing	43	71.7	39	65.0	0.556
Hearing health and impairment	52	86.7	45	75.0	0.167
Organization of the SASA	56	93.3	52	86.7	0.289
Hearing aid use, handling, and cleaning	54	90.0	50	83.3	0.388
Importance of follow-up visits	53	88.3	50	83.3	0.629

Statistical test: McNemar test ( $p < 0.05$ )

Captions: n = number of correct answers (total of 60 problem situations per topic); % = percentage; SASA = Hearing Healthcare Services (in Portuguese).

**Table 2.** Comparison between “maintenance” and the other performances per topic

Topics	CHW's performance	Scores		p-value
		n	%	
Hearing	Maintenance	28	46.7	Reference
	Failure	6	10.0	< 0.0001*
	Progression	11	18.3	0.0009*
	Regression	15	25.0	0.0133*
Hearing health and impairment	Maintenance	39	65.0	Reference
	Failure	2	3.3	< 0.0001*
	Progression	6	10.0	< 0.0001*
	Regression	13	21.7	< 0.0001*
Organization of the SASA	Maintenance	50	83.3	Reference
	Failure	2	3.3	< 0.0001*
	Progression	2	3.3	< 0.0001*
	Regression	6	10.0	< 0.0001*
Hearing aid use, handling, and cleaning	Maintenance	46	76.7	Reference
	Failure	2	3.3	< 0.0001*
	Progression	4	6.7	< 0.0001*
	Regression	8	13.3	< 0.0001*
Importance of follow-up visits	Maintenance	43	71.7	Reference
	Failure	0	0.0	-
	Progression	7	11.7	< 0.0001*
	Regression	10	16.7	< 0.0001*

Statistical test: Binomial test ( $p < 0.05$ )

Captions: n = number of answers (total of 60 problem situations per topic); % = percentage; SASA = Hearing Healthcare Services (in Portuguese); CHW = community health worker; Maintenance = Correct answer in both the immediate and late post-training quizzes (knowledge maintained); Failure = Error in both the immediate and late post-training quizzes; Progression = Error in the immediate and correct answer in the late post-training quiz; Regression = Correct answer in the immediate and error in the late post-training quiz; \* = significant results.

**Table 3.** Association between community health workers' performances in the various topics and their age groups

Topics	CHW's performance	Age (in complete years)						Fisher p-value
		29 to 39		40 to 49		More than 50		
		n	%	n	%	n	%	
Hearing	Maintenance	6	50.0	8	44.4	14	46.7	9.476
	Failure	2	16.7	3	16.7	1	3.3	
	Progression	4	33.3	2	11.1	5	16.7	
	Regression	0	0.0	5	27.8	10	33.3	
Hearing health and impairment	Maintenance	10	83.3	10	55.6	19	63.3	3.209
	Failure	0	0.0	1	5.6	1	3.3	
	Progression	1	8.3	2	11.1	3	10.0	
	Regression	1	8.3	5	27.8	7	23.3	
Organization of the SASA	Maintenance	11	91.7	14	77.8	25	83.3	6.312
	Failure	1	8.3	0	0.0	1	3.3	
	Progression	0	0.0	2	11.1	0	0.0	
	Regression	0	0.0	2	11.1	4	13.3	
Hearing aid use, handling, and cleaning	Maintenance	11	91.7	15	83.3	20	66.7	5.935
	Failure	0	0.0	1	5.6	1	3.3	
	Progression	1	8.3	1	5.6	2	6.7	
	Regression	0	0.0	1	5.6	7	23.3	
Importance of follow-up visits	Maintenance	8	66.7	14	77.8	21	70.0	4.903
	Failure	0	0.0	0	0.0	0	0.0	
	Progression	3	25.0	0	0.0	4	13.3	
	Regression	1	8.3	4	22.2	5	16.7	

Statistical test: Fisher's exact test ( $p < 0.05$ )

Captions: n = number of answers (total of 60 problem situations per topic); % = percentage; SASA = Hearing Healthcare Services (in Portuguese); CHW = community health worker; Maintenance = Correct answer in both the immediate and late post-training quizzes (knowledge maintained); Failure = Error in both the immediate and late post-training quizzes; Progression = Error in the immediate and correct answer in the late post-training quiz; Regression = Correct answer in the immediate and error in the late post-training quiz; Fisher = Fisher's exact statistical test.

**Table 4.** Association between community health workers' performances in the various topics and their education level

Topics	CHW's performance	Education level				Fisher p-value
		High school graduate		Bachelor's degree		
		N	%	n	%	
Hearing	Maintenance	19	43.2	9	56.3	2.093
	Failure	4	9.1	2	12.5	
	Progression	8	18.2	3	18.8	
	Regression	13	29.5	2	12.5	
Hearing health and impairment	Maintenance	27	61.4	12	75.0	0.972
	Failure	2	4.5	0	0.0	
	Progression	5	11.4	1	6.3	
	Regression	10	22.7	3	18.8	
Organization of the SASA	Maintenance	36	81.8	14	87.5	1.561
	Failure	1	2.3	1	6.3	
	Progression	2	4.5	0	0.0	
	Regression	5	11.4	1	6.3	
Hearing aid use, handling, and cleaning	Maintenance	35	79.5	11	68.8	1.929
	Failure	1	2.3	1	6.3	
	Progression	3	6.8	1	6.3	
	Regression	5	11.4	3	18.8	
Importance of follow-up visits	Maintenance	32	72.7	11	68.8	1.281
	Failure	0	0.0	0	0.0	
	Progression	4	9.1	3	18.8	
	Regression	8	18.2	2	12.5	

Statistical test: Fisher's exact test ( $p < 0.05$ )

Captions: n = number of answers (total of 60 problem situations per topic); % = percentage; SASA = Hearing Healthcare Services (in Portuguese); CHW = community health worker; Maintenance = Correct answer in both the immediate and late post-training quizzes (knowledge maintained); Failure = Error in both the immediate and late post-training quizzes; Progression = Error in the immediate and correct answer in the late post-training quiz; Regression = Correct answer in the immediate and error in the late post-training quiz; Fisher = Fisher' exact statistical test.

**Table 5.** Association between community health workers' performances in the various topics and their length of service

Topics	CHW's performance	Length of service (in complete years)						Fisher p-value
		Less than 10		From 10 to 15		More than 15		
		n	%	n	%	n	%	
Hearing	Maintenance	10	62.5	4	33.3	14	43.8	6.051
	Failure	0	0.0	1	8.3	5	15.6	
	Progression	3	18.8	4	33.3	4	12.5	
	Regression	3	18.8	3	25.0	9	28.1	
Hearing health and impairment	Maintenance	10	62.5	8	66.7	21	65.6	1.956
	Failure	1	6.3	0	0.0	1	3.1	
	Progression	1	6.3	1	8.3	4	12.5	
	Regression	4	25.0	3	25.0	6	18.8	
Organization of the SASA	Maintenance	12	75.0	10	83.3	28	87.5	4.529
	Failure	0	0.0	1	8.3	1	3.1	
	Progression	1	6.3	0	0.0	1	3.1	
	Regression	3	18.8	1	8.3	2	6.3	
Hearing aid use, handling, and cleaning	Maintenance	12	75.0	9	75.0	25	78.1	2.743
	Failure	0	0.0	1	8.3	1	3.1	
	Progression	1	6.3	1	8.3	2	6.3	
	Regression	3	18.8	1	8.3	4	12.5	
Importance of follow-up visits	Maintenance	12	75.0	5	41.7	26	81.3	6.962
	Failure	0	0.0	0	0.0	0	0.0	
	Progression	2	12.5	3	25.0	2	6.3	
	Regression	2	12.5	4	33.3	4	12.5	

Statistical test: Fisher's exact test ( $p < 0.05$ )

Captions: n = number of answers (total of 60 problem situations per topic); % = percentage; SASA = Hearing Healthcare Services (in Portuguese); CHW = community health worker; Maintenance = Correct answer in both the immediate and late post-training quizzes (knowledge maintained); Failure = Error in both the immediate and late post-training quizzes; Progression = Error in the immediate and correct answer in the late post-training quiz; Regression = Correct answer in the immediate and error in the late post-training quiz; Fisher = Fisher' exact statistical test.

## DISCUSSION

The findings of this study indicate that, in general, the knowledge built on the five topics covered in the educational actions was maintained months after they had been held. The “maintenance” performance significantly stood out from the others, and the acquired knowledge was retained regardless of the CHWs’ age group, education level, or length of service, inferring that the educational actions were effective even in different contexts.

Contrary to what was found in the present study, a survey that aimed to verify CHWs’ retention of information on child hearing health 15 months after participating in training found a significant reduction in their overall knowledge<sup>19</sup>. This divergence can be justified by the differences in methodologies and the period between actions and the measurement of retained knowledge.

Concerning methodologies, the present study carried out synchronous remote actions with an active teaching methodology, and researchers were available to answer any questions participants might have. In the cited study<sup>19</sup>, CHWs were trained on child hearing health by a cyber tutor; they accessed the material individually and conducted their own learning, guided by an electronic tutor who verified each professional’s performance and study schedule. It is believed that this direct interaction with researchers may have favored the results obtained here.

Moreover, CHWs’ better performance in the present research may be explained by the shorter time between actions and the measurement of retained knowledge, which was 5 to 6 months in this study and 15 months in the cited one<sup>19</sup>. Knowledge can be maintained for longer periods after educational actions. As reported in the surveyed literature<sup>20</sup>, memory declines shortly after the first recall, with a subsequent decrease in the forgetting rate until it reaches the so-called point at which information is no longer forgotten<sup>20</sup>. Thus, considering that the information that could be lost in the learning process had already been dispersed, the present study proved to maintain acquired knowledge effectively.

Various studies in the surveyed literature investigated the effectiveness of educational actions shortly after they had been carried out<sup>9,12-14,21-23</sup>. However, there is a lack of studies measuring the long-term maintenance of acquired knowledge, with only one publication being found so far<sup>19</sup> – which has already been demonstrated in a systematic literature review<sup>8</sup>.

The analysis of the relationship between the CHWs’ age group, education level, length of service, and their maintenance of acquired knowledge revealed no association between such factors, indicating that knowledge was maintained regardless of these variables. The lack of a relationship between age group and knowledge retention months after carrying out educational activities differs from what is defended by researchers who state that the younger the professional, the lower their resistance to changes and the less rooted their concepts on health-disease processes, being more open to changes and new developments, which favors their training<sup>24</sup>.

Moreover, the increased number and complexity of tasks assigned to CHWs in recent years have required higher levels of education, as the greater their education level, the greater the chances of them incorporating new knowledge and meeting their growing daily demands<sup>24</sup>. Studies have shown that most CHWs have graduated from high school, followed by a portion who are currently studying or have already graduated from higher education<sup>22,25-27</sup>, which was also demonstrated in the present research. This may justify the lack of a relationship between CHWs’ knowledge maintenance and education level in this study, as all professionals in the sample were at least high school graduates.

Regarding length of service, the findings of this research differed from those of other researchers who pointed out a relationship between working time and the knowledge acquired by CHWs in Caruaru, Pernambuco, on aspects related to breastfeeding<sup>22</sup>. The authors argue that the longer the experience, the greater the access professionals have to refresher courses<sup>22</sup>. It is worth noting that the said study<sup>22</sup> did not research the maintenance of knowledge, but rather the knowledge acquired after a workshop on that topic.

It is believed that the present study found no relationship between the knowledge retained months after the actions and the length of service because the CHWs in the region had not yet been exposed to this topic. Therefore, they were interested in actively participating in the actions, which helped them acquire and maintain knowledge equitably. Furthermore, CHWs may have been guided and encouraged to perform their role with excellence since the beginning of their work in the profession.

Studies show that the distance learning methodology used in this research has already been used effectively by health professionals for many years<sup>28,29</sup>. Methods such as videoconferencing improve access



to continuing education, despite technical difficulties, and offers considerable cost savings<sup>28</sup>. A study aimed to evaluate videoconferencing as an instructional tool in CHW training on child hearing health and showed that this communication technology was valid and accepted by professionals to be used in training programs<sup>30</sup>.

A recent study described three hearing health promotion experiences carried out remotely during the COVID-19 pandemic in inland Rio de Janeiro and found that remote actions were as enriching and essential for all those involved as in-person ones before the pandemic<sup>11</sup>. The findings of this research promote effectiveness and encourage remote educational actions. Remote teaching as a means of building and disseminating knowledge has been gaining strength, as it makes information more accessible and decentralized from big cities, being an excellent strategy for promoting hearing health through informative and educational actions.

However, this study had some obstacles and limitations regarding this teaching modality, including the lack of electronic devices (mobile phones and computers), Internet connection difficulties, misinformation about how to use videoconferencing (Google Meet), and the need for assistance to participate in remote meetings. These barriers may have led some CHWs to discontinue their participation. On the other hand, the actions were evidently effective among those who actively participated, demonstrated by the CHWs' maintenance of knowledge on the topics in question.

Regarding these topics, an international study developed by researchers from the University of Arizona, in the United States, showed that CHWs identified the need to offer accurate information on hearing in their communities. They also expressed the desire to receive training in more detail, which would allow them to disseminate knowledge on this topic and increase the population's access to hearing healthcare. This desire resulted in the development of CHW training on audiology and hearing loss. The authors found that CHWs increased their knowledge and improved skills to facilitate education on hearing-related aspects<sup>31</sup>.

Despite the relevance of these activities, the present study found that the CHWs participated irregularly in the educational actions, which is another limitation of this study. Evasion is due to several factors, such as illness, vacations, absences, lack of interest, misinformation, work overload, and so forth. A study on the adherence of health professionals to continuing education activities highlighted it was compromised by structural work

issues, including workload and administrative aspects, and a lack of interest and encouragement<sup>32</sup>. This finding is in line with another survey with the same population that found issues such as lack of personal interest, little publicity, lack of leave of absence from management, and demotivation as obstacles<sup>33</sup>.

Hence, it is necessary to promote strategies that result in greater adherence by health professionals, enabling the acquisition of knowledge on the proposed topics and, consequently, greater assertiveness and security in their actions. Finally, remote continuing education actions are encouraged (as they have proved to be effective in the long run as well) to extend them to different health professionals and address the most diverse topics. Furthermore, longitudinal studies should be developed to follow up on participants for longer.

## CONCLUSION

It is concluded that CHWs maintained the knowledge they had acquired for months after the remote educational actions, regardless of their age group, education level, or length of service. This indicates that these professionals acquired quality knowledge.

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