Creation of a self-guided course about oral cancer for Community Health Workers: A Teleeducation experience

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Abstract: **Objective**: To report the experience of creating and providing a self-instructional course about oral cancer, in a Telehealth platform, to Community Health Workers, and to analyze the participants' clinic and demographic profile. **Methods**: Descriptive cross-sectional study of development and implementing experience of a course carried on a virtual learning environment, based on ADDIE, an Instructional Design model. The Kolmogorov-Smirnov test was applied, with 95% confidence level for quantitative variables. **Results**: The initial stage consisted of constructing the online course. In the second stage, the course was provided in a virtual learning environment. The course *"Abre a boca, meu povo! - O que você precisa saber sobre o câncer de boca"* was provided to the target audience with a student's guide, initial survey, four modules with video lessons, initial and final knowledge test, satisfaction evaluation and certificate. Simplicity, clarity and objectivity have been prioritised in the transmission of knowledge. The final sample comprised 205 Community Health Workers. The predominant profile consisted of professionals aged between 40 and 49 years, female, with more than 10 years of career. **Conclusions**: The course achieved its objectives, revealing a satisfactory number of professionals in its first edition.

➤ **Keywords:** Mouth Neoplasms. Community Health Workers. Telemedicine. Education, Continuing. Distance Education.

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Introduction

Oral cancer (OC) is a life-threatening disease of high morbimortality, common in mostly low- and middle-income countries. It is one of the rifest types of cancer and of oral pathologies as a whole (Bray *et al*., 2018; Brito *et al*., 2020). The literature reports a high prevalence of late treatment of patients with OC in the northeast region, and in the state of Pernambuco the waiting time to start treatment is estimated at more than 60 days (Pereira, 2023). According to data from the National Cancer Institute, the estimated number of new OC cases in 2023 is 580/100.000 inhabitants (Brasil, 2022), which is a worrying figure, justifying the need for research and action in Public Health.

In Brazil, the Community Health Worker (CHW) is an essential professional for the satisfactory operation of the Family Health Strategy (FHS) team in the Primary Health Care (PHC). This category of professionals serves as spokespersons in the communities, representing an extension of the FHS, and their work is of great value for the health education in the communities (Barreto *et al*., 2020).

Among their assignments is the exercise of activities related to disease prevention and health promotion through community actions or domiciliary visits, developed in consonance to the guidelines established by the Brazilian National Health System (SUS), as well as the embracement and follow-up of people presenting symptoms or clinical signs of oral cavity alterations, targeting the risk population (Brasil, 2006; Nemoto *et al*., 2015; Brasil, 2018). Thus, the training of these professionals is essential for the oral cancer screening programs (Desai *et al*., 2015; Birur *et.al*, 2018; Bhatt *et al*., 2018), to make the identification and early diagnosis of the disease possible (Barreto *et al*., 2020).

Teleeducation consists of an important alternative to improve access to Continuing Education in Health (CEH) (Brites; Rocha, 2017; Rodrigues *et al*., 2019; Savassi *et al*., 2019), using the Information and Communication Technologies (ICT) to contribute to the training of health professionals and students. It has a diversified portfolio of services to produce materials and publishing in the educational platforms (courses, community of practices, virtual libraries), and social media (disclosure of videos and other resources within the scope of the working process and the development of actions in health education). Therefore, it is possible to provide reliable information, based on the scientific evidence and applicable in the context of the work (Oliveira *et al*., 2020).

To date, no record was found in the current literature about the creation of a self-instructional course about oral cancer based on the FHS, targeted to CHWs. This study aims to report the experience of the creation and providing of a distance-learning course, free of charge and self-instructional about oral cancer, focused on the training of CHWs, entitled "*Abre a boca, meu povo! – O que você precisa saber sobre o câncer de boca*" ["Open your mouth, folks! – What you need to know about oral cancer"] that was provided in an educational platform based in the state of Pernambuco, as well as to analyze the clinic-demographic profile of the participants.

Methodology

Descriptive cross-sectional study of development and implementing experience of a course carried on a virtual learning environment (Campana *et al*., 2001). It was submitted to and approved by the Clinical Research Ethics Committee under approval number 4.958.203, and performed in two stages. In the first stage, the technical-scientific creation of the course was performed, whereas the second part consisted of providing of the course. The Instructional Design (ID) method was set as a supporting tool (Barreiro, 2016; Rosa; Barbosa, 2017). The research was conducted in a virtual site, between September 2020 to August 2021.

The methods established for the conception and evaluation of course *"Abre a boca, meu povo! - O que você precisa saber sobre o câncer de boca"* were based on the ADDIE model *(Analysis, Design, Development, Implementation and Evaluation)*, an ID model used as a guide for the development of educational projects, which consisted of the following steps: 1) Analysis, 2) Design, 3) Development, 4) Implementation and 5) Evaluation (Rodrigues *et al*., 2019; Rocha, 2020). The steps of Analysis, Design and Development were performed in the first stage. The implementation and evaluation of the course were performed in the second stage.

The sample was composed of CHWs, of both sexes, besides of their location, who have completed all the stages of the course until October 28, 2021. CHWs that did not answer the questionnaire of the clinic-demographic profile, entitled initial survey (IS); did not answer the initial knowledge check (IKC) or the final knowledge test (FKT); did not answer any of the formative assessments (FA) at the end of the module; scored below 6,0 in any of the FA, or scored below 6,0 in the final knowledge test (FKT), were excluded.

Since it is a course about health that demands a lot of responsibility in the application of the knowledge learned, it was established to have a minimum success rate of 60%, or minimum score 6,0 in the assessments for certification. All the participants agreed to the Informed Consent document via electronic forms (*Google Forms*).

Statistical analysis

The software Statistical Package for the Social Sciences 13.0 for Windows and Excel 2010 were used. The results were presented in a table with their respective absolute and relative frequencies. Kolmogorov-Smirnov normality test was applied for quantitative variables. The clinical-demographic profile variables were categorized as follows: age (< 30 years, 30 and 39 years, 40 and 49 years, 50 and 59 years, ≥ 60 years); gender (female, male or others); schooling (elementary, secondary, and higher); time working as CHW (up to 10 years or more than 10 years). The cities and states where the course operates were grouped into macro-regions of Pernambuco and cities of other states. A descriptive analysis of these data was performed with 95% confidence and a margin of error of 5%.

Results

Stages of the research

- **Stage 1**: Technical-scientific creation of the course: The first steps of the methods were performed.

1. Analysis: The issues were analyzed by the technical-scientific group, composed of 2 lecturers, 2 master's students, and 2 doctoral students in Dental Clinics to define the objectives and what needed to be worked through based on the validity and topicality of the subject, as well as on a literature review, ascertaining the importance of training the Primary Health Care professionals, defining the CHWs as the target audience (Desai *et al*., 2015; Birur *et al*., 2018; Bhatt *et al*., 2018; Birur *et al*., 2019; Koo *et al*., 2020; Oswald *et al*., 2020; Mishra *et al*., 2021, Thankappan *et al*., 2020; Ramesh *et al*., 2022; Thampi *et al*., 2022).

2. Design: A work schedule was stipulated, and the pedagogic planning of the course was made (Chart 1). The scientific content addressed different points in the process of identification of oral lesions (OL) and early detection of OC, focusing on the important role of the CHWs, as well as contextualizing the contents in the

practical reality of the work routine. The defined workload was 40 hours. Simplicity, clarity and objectivity in the transmission of knowledge were prioritized. We sought to use an attractive design in the creation of classes and handouts, with simple texts, illustrations, images, infographics, audios, videos and interactive activities. Some activities used *gamification* resources with ludic formats such as: "puzzle", "memory game", "word search", "crossword" and "drag and drop". Other activities were elaborated with questions that problematized the subject in the context of the professionals' practice, based on the Problem Based Learning method.

Chart 1. Course's scientific content

Module 1	Module 2	Module 3	Module 4
Unit 1 Classroom: The role of the Community Health Workers in the fight against oral cancer. Fixation Activity 01 **Unit 2** Classroom: Biosafety Fixation Activity 02 Fixation Activity 03	**Unit 1** Classroom: Anatomy of the mouth and adjacent structures Fixation Activity 01 Fixation Activity 02 Fixation Activity 03 **Unit 2** Classroom: Mouth Inspection Fixation Activity 04	**Unit 1** Classroom: Fundamental Lesions Fixation Activity 01 Fixation Activity 02 **Unit 2** Classroom: Disorders with potential for malignant transformation Fixation Activity 03 Fixation Activity 04 Fixation Activity 05 Fixation Activity 06	**Unit 1** Classroom: Oral Cancer Fixation Activity 01 Fixation Activity 02 Fixation Activity 03 Fixation Activity 04 **Unit 2** Classroom: Oral cancer and the Healthcare system Fixation Activity 04 Fixation Activity 04 Fixation Activity 04 Fixation Activity 04
Virtual Library Module´s Formative Assessment	Virtual Library Module´s Formative Assessment	Virtual Library Module´s Formative Assessment	Virtual Library Module´s Formative Assessment

Source: The authors.

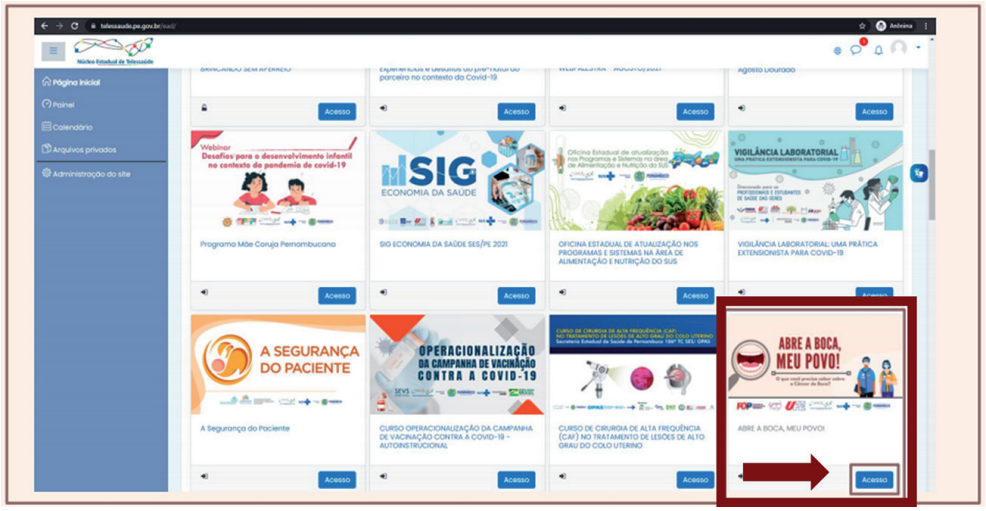
3. Development: A distance learning, self-instructional and permanent course was created. The Moodle tool (Modular Object-Oriented Dynamic Learning Environment) (Oliveira *et al.*, 2016) was used as virtual learning environment (VLE), which provided digital educational resources such as video lessons given by the team, interactive learning activities, virtual libraries containing handouts in

PDF (Portable Document Format). The course was structured as follows: Student Guide; Initial Survey (IS) – a clinical-demographic profile questionnaire; Initial Knowledge Check (IKC); 8 Learning Units, distributed in 4 sequential modules, accompanied by handouts in PDF, fixation activities and interactive feedback, formative assessments (FA) at the end of each module; Final Knowledge Test (FKT) and Satisfaction Assessment (SA) (Figure 1).

Figure 1. Methodological path of the course

In the second phase of the project, the course was implemented with the layout of the handouts, the insertion of the contents in the VLE of the teaching platform, and, finally, the provision of the course to the target audience on August 18, 2021. The course is freely accessible to individuals from any location in Brazil and the world, as long as they register on the platform through the website https://telessaude.pe.gov.br (Figure 2). After registering, participants can identify the "Course Setting", which welcomes them and provides a brief presentation with a link to the students' guide, which contains data about the course, its objectives, access tutorial, and step by step of the navigation settings.

Figure 2. Open access course available on the platform



The first questionnaire answered by the students was the IS, with 09 questions related to the clinical-demographic profile: age, sex, level of education, time working as an CHW, city and state where they work, and which equipment they would most use to access the course and profession. Then, the participants were directed to answer the IKC, for analysis of prior knowledge. After the test, the modules were started in video classes. At the end of each module, formative assessments were applied, each consisting of 10 multiple-choice questions about concepts and practical applications addressed. Upon completion of the course, participants were directed to the FKT. This test was the same as the IKC. Then, they responded to the satisfaction assessment and were directed to the link that gave access to the certificate.

The course is available in a virtual platform to all health workers; however, the target audience were the CHWs. From August 14 to October 28, 2021, all data were collected from the first experience of the self-instructional course *"Abre a boca, meu povo! - O que você precisa saber sobre o câncer de boca"*. Seven hundred and twenty individuals (n=720) started the course by filling out the IS. After applying the eligibility criteria, two hundred and five (n = 205) CHW comprised the final sample. In the evaluated sample (n = 205), 34.6% (n = 71) participants belonged to the age group between 40 and 49 years old; 90.2% (n = 185) were female; 53.7% (n = 110) completed secondary education; 57.1% (n = 117) had worked as CHWs for more than 10 years; and 88.3% (n = 181) were in Pernambuco. Regarding the macro-region of the State of Pernambuco, where the CHWs work, 50.7% (n = 104) were in the Metropolitan Region. When asked about which device they used most to access the course, 55.1% (n=113) of the participants answered cellphone (Table 1).

Table 1. Participants' clinical demographic profile

VARIABLES	n	%
AGE		
<30	21	10,2
30-39	56	27,3
40-49	71	34,6
50-59	45	22,0
+60 Z	12	5,9

continue...

VARIABLES	n	%
GENDER		
Female	185	90,2
Male	19	9,3
Others	1	0,5
SCHOOLING		
Incomplete primary education	2	1,0
Complete primary education	4	2,0
Incomplete secondary education	8	3,9
Complete secondary education	110	53,7
Incomplete tertiary education	24	11,7
Complete tertiary education	57	27,8
LENGTH OF PROFESSIONAL EXPERIENCE AS CHW		
0-10	88	42,9
> 10	117	57,1
STATE IN WHICH WORKS AS CHW		
PE	181	88,3
Other States	24	11,7
PR	21	10,2
PB	1	0,5
AM	2	1,0
MACRORREGION OF PE IN WHICH WORKS AS CHW		
Metropolitan Region of Recife	104	50,7
Agreste	15	7,3
Sertão	49	23,9
São Francisco Valley	13	6,3
DEVICE USED TO ACCESS THE COURSE		
Cellphone	113	55,1
Desktop Computer	27	13,2
Notebook	24	11,7
Tablet	40	19,5

CHW: Community Health Worker, PE: Pernambuco, PR: Paraná, PB: Paraíba, AM: Amazonas.
Source: The authors.

Discussion

The evident need to carry out FHS work aimed at CHWs to enable them to act in prevention and education actions, especially about oncological diseases such as OC, supported the idea of creating and developing the course *"Abre a boca, meu povo! - O que você precisa saber sobre o câncer de boca"*. It is believed that this course can qualify the work of CHWs, enabling action in the prevention and early detection of OC as well as providing guidance on the flow of care and treatment of OC in the health care network. The good number of subscribers demonstrated this need and the interest of the CHWs and other professionals working in the PHC in acquiring knowledge and developing skills related to the OC.

The strategy of creation a course based on teleeducation achieved the main objective of the research. Although there are no similar studies in the literature, teleeducation is an important learning tool today, and has already been reported in other experiences, such as: Training CHWs in Diabetes Mellitus, using a virtual learning environment (Brassarola, 2014); training for primary health care professionals in Oral Medicine (Roxo-Gonçalves *et al*., 2017).

The understanding of the profile of professionals working in the health area, as well as the data collected, especially of those who work in PHC, is necessary to strengthen the planning capacity of managers in the SUS. Thus, the analysis of the profile of the CHW is of paramount importance, as it can help to understand the characteristics of these professionals' practice as well as subsidize the planning and decision-making in relation to the implementation of public health and CEH policies that involve them.

As for gender, we found 90.2% female, a finding that corroborates most of the studies analyzed, where this predominance was observed (Savassi *et al*., 2019; Araújo *et. al*, 2021; Oliveira *et al*., 2019; Brassarola *et al*., 2014). It is believed that the greater number of women in the role of CHW may be associated with affinity and trust with families in communities, as they seem to convey the idea of greater security and a better ability to care for the others, characteristic related to the role of women in society.

Regarding schooling, most CHWs had completed high school. Equivalent results were found in most of the reviewed literature (Araújo *et. al*, 2021; Oliveira, 2018; Nascimento Junior *et al*., 2017). This data is already in accordance with the

Law 13,595/2018 (Brasil, 2018), which places secondary education as one of the requirements of the competitive examinations for the exercise of the CHW activity. However, the law considers that if there is no registered candidate who meets this requirement, the hiring of a candidate with elementary education may be admitted, who must prove the conclusion of secondary education, within a maximum period of three years. This explains the small percentage, still found in the studies, of CHW who only have elementary education.

Furthermore, a considerable number of 39.5% of the participants in higher education was observed. It is noted that, even though it is not a requirement for exercising the profession, there has been an improvement in the level of education among the CHWs. This trend has been confirmed in studies carried out by Oliveira *et al*. (2019), who found 23% in higher education, and by Oliveira *et al*. (2018), who observed that 47.7% of their sample had completed higher education. It is suggested that the increase in the level of education may be due to the CHW's conviction that this can favor their performance, when considering the wide range of knowledge that must be learned and the need for interaction with the Community (Oliveira *et al*., 2019; 2018).

Although this project was created with the objective of providing a teleeducation action in the State of Pernambuco, the scope was expanded through the participation of professionals in other states. The positive results also showed that teleeducation is an efficient strategy for the production and application of self-instructional distance learning courses on a large scale for CHWs across the country. The data showed that, although most CHWs were located in Pernambuco, there was participation from people from other states, such as Paraíba, Amazonas, and Paraná. It is believed that there was no greater adherence to CHW in other states, due to the advertising of the course being directed, for the most part, to the state of Pernambuco among managers, health professionals, colleges, universities, and social networks on the platform. We recognize the need to expand disclosure in future editions, given the benefits that the course can provide to FHS teams throughout Brazil, and consequently to the population.

Regarding the macro-region of Pernambuco where they work as CHW, most participants are located in the Metropolitan Region of Recife, followed by the CHW of Sertão, Agreste, and, to a lesser extent, in the São Francisco Valley. These results reflect the scope and importance of ICT in providing health education,

especially in remote and difficult-to-access regions. According to Nascimento *et al.* (2017), resources such as online courses and web conferences, can provide the dissemination of knowledge in different regions that contribute to the improvement of PHC professionals through CEH actions.

The course was not mandatory and did not have a time stipulated for participants to complete it. This contributes to the freedom to carry out course activities without compromising other areas of their lives, which dialogues with Freire's pedagogy for training young people and adults, which proposes teaching focused on the real needs of the student, his reading of the world, and which values your time and potential (Freire, 2011). This perspective is contemplated in self-instructional courses, which allow individuals to study and learn at their own pace, according to their availability of time. A limitation highlighted by the researchers was that the short period between the opening day of the course and the completion of the data collection could partly explain the reduced number of conclusions in this period (2 months and 15 days). It is believed that some participants require more time to complete a 40-hour course, an issue that should be reviewed for other editions.

Final considerations

The self-instructional training course created met the objectives proposed in the research, showing that Teleeducation represents a viable and accessible alternative in the training of health professionals.

The clinical-demographic profile of the CHWs in the self-instructional training course on OC was: age between 40 and 49 years, female, high school, more than 10 years in the profession, located in the State of Pernambuco, mostly in the Metropolitan Region of Recife, with the cellphone as the most used device to assess the course.[1]

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Note

[1] B. P. N. dos Santos: construction of the theoretical framework, production and data collection. Responsible for all aspects of the work, ensuring its accuracy. M. M. F. da Silveira and A. P. V. Sobral: construction of the theoretical framework, idealization and coordination of the research. Final approval of the version to be published. R. T. N. dos Santos, Z. B. B. M. de Farias and H. C. R. de Almeida: construction of the theoretical framework, writing of the manuscript, critical review and data collection.

Resumo

Criação de um curso autoinstrucional sobre câncer de boca para Agentes Comunitários de Saúde: uma experiência de telemedicina

Objetivo: Relatar a experiência da criação e disponibilização de curso autoinstrucional sobre câncer de boca, em plataforma de Telessaúde, para Agentes Comunitários de Saúde, e analisar o perfil clínico-demográfico dos participantes. **Metodologia**: Estudo transversal descritivo da experiência de implantação e desenvolvimento de curso realizado em ambiente virtual de aprendizagem, baseado em ADDIE, um modelo de Design Instrucional. Foi aplicado teste de normalidade de Kolmogorov-Smirnov, com 95% de confiança para variáveis quantitativas. **Resultados**: A primeira fase consistiu na construção do curso *on-line*. Na segunda fase, o curso foi disponibilizado em ambiente virtual de aprendizagem. O curso *"Abre a boca, meu povo! - O que você precisa saber sobre o câncer de boca"* foi disponibilizado ao público-alvo com um manual do aluno, enquete inicial, quatro módulos com videoaulas, testes de conhecimentos inicial e final, avaliação de satisfação e certificado. Simplicidade, clareza e objetividade foram priorizadas na transmissão dos conhecimentos. A amostra final foi composta por 205 Agentes Comunitários de Saúde. O perfil predominante foi de profissionais com idade entre 40 e 49 anos, do sexo feminino, com mais de 10 anos de carreira. Conclusões: O curso atingiu os objetivos propostos, revelando um quantitativo satisfatório de profissionais, em sua primeira edição.

➤ **Palavras-chave:** Neoplasias Bucais. Agentes Comunitários de Saúde. Telemedicina. Educação Continuada. Educação à Distância.