Validation of libras technology for health education of deaf people

Validação de tecnologia em libras para educação em saúde de surdos

Validación de tecnología en Libras para educación en salud de sordos

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Abstract
Objective: To produce and validate an educational video in Libras (Brazilian Sign Language) for the health education of deaf people about AIDS and its transmission forms.
Methods: Methodological development study, with psychometric referential, developed in an audio-communication school. Five judges and 18 deaf people participated. On data collection, the Likert scale was used and, on analysis, Cronbach's Alpha and Content Validity Index (CVI) were used.
Results: The educational video "Libras communication: learning about Acquired Immunodeficiency Syndrome (AIDS)" is 20 minutes long. Video script was divided in three blocks with their respective items: Block A – AIDS, transmission forms, signs and symptoms, diagnosis, treatment, prevention; Block B – Kinds of protection. Block C – AIDS, a public health problem. Among judges, average CVI of 0.96 was obtained for the items and 0.90 for the psychometric criteria of general assessment. Among deaf people, average CVI of 0.87 was obtained. Total Cronbach's Alpha for the judges was 0.989 and, for the deaf subjects, 0.634.
Conclusion: The educational video presents evidence of validity and representativeness to be used in health care and health education processes of the target population.

Resumo
Objetivo: Construir e validar um vídeo educativo em Libras para educação em saúde de surdos acerca da Aids e suas formas de transmissão.
Métodos: Estudo de desenvolvimento metodológico, com referencial psicométrico, desenvolvido em uma escola de audiocomunicação. Participaram cinco juízes e 18 pessoas surdas. Na coleta dos dados utilizou-se escala Likert e, na análise, o Alfa de Cronbach e o Índice de Validade de Conteúdo (IVC).
Resultados: O vídeo educativo "Comunicação em Libras: aprendendo sobre a Síndrome da Imunodeficiência Adquirida (Aids), tem duração de 20 minutos. O roteiro do vídeo foi dividido em três blocos e respectivos itens: Bloco A - Aids, formas de transmissão, sinais e sintomas, diagnóstico, tratamento, prevenção; Bloco B - Tipos de preservativos. Bloco C - Aids, um problema de saúde pública. Obteve-se entre os juízes IVC médio de 0,96 para os itens e de 0,90 para os critérios psicométricos de avaliação geral. Entre os surdos obteve-se IVC médio de 0,87. O Alpha de Cronbach Total para os juízes foi 0,989 e, para os surdos 0,634.
Conclusão: O vídeo educativo apresenta evidências de validade e representatividade para ser utilizado na assistência e nos processos de educação em saúde do público-alvo.

Resumen
Objetivo: Elaborar y validar un video educativo en lengua de señas brasileña (Libras) para educación en salud de sordos sobre el SIDA y sus formas de transmisión.
Métodos: Estudio de desarrollo metodológico, con referencial psicométrico, realizado en una escuela de audiocomunicación. Participaron 5 jueces y 18 personas sordas. Para la recolección de datos, se utilizó la escala Likert; y para el análisis, el alfa de Cronbach y el Índice de Validez de Contenido (IVC).
Resultados: El video educativo "Comunicación en Libras: aprendiendo sobre el síndrome de inmunodeficiencia adquirida (SIDA)" tiene una duración de 20 minutos. El guion del video se dividió en tres partes con sus respectivos ítems. Parte A: SIDA, formas de transmisión, señales y síntomas, diagnóstico, tratamiento, prevención; Parte B: tipos de preservativos; Parte C: SIDA, un problema de salud pública. Entre los jueces se obtuvo IVC promedio de 0,96 en los ítems y 0,90 en los criterios psicométricos de evaluación general. En los sordos el IVC promedio fue 0,87. El alfa de Cronbach total fue 0,989 para los jueces y 0,634 para los sordos.
Conclusión: El video educativo presenta evidencias de validez y representatividad para utilizarse en la atención y procesos de educación en salud del público destinatario.

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Introduction

Since the Acquired Immunodeficiency Syndrome (AIDS) epidemic in the 1980's there have been advances to its treatment, with the implementation of antiretroviral therapy in constant upgrading and scheme simplification, introduction of new medication combinations with distinct action mechanisms and decrease in adverse side-effects. [1]

Such actions make it evident that countries take combat efforts against this disease, which still remains as a public health problem. This context motivated the participating countries in the 20th International AIDS Conference, in 2014, to commit to reach, until 2020, a treatment goal: 90% diagnosed, under treatment and with viral suppression. [2]

However, the global experience has been showing that coercive strategies push people away from services. In that sense, the UN 2030 Agenda for Sustainable Development takes the concepts of inclusion, equity and social justice for tracking approach in line with UNAIDS 2016-2021 Strategy which is believed to prevent 17.6 million new HIV infections and 10.8 million deaths due to AIDS between 2016-2030. [3]

In Brazil, the high mortality rate due to AIDS in different social segments presents a challenge for health professionals' praxis, because restrictions still persist when it comes to debating sexuality, criminalizing transmission, besides medicalization bringing an individual ontology that fails to consider political experiences, memory of struggles, and connections to human rights and solidarity. In that scenario, the Brazilian response to AIDS has society and its reactions as the protagonist, demanding public policies to face the epidemy. Therefore, if there is collective vulnerability, it is necessary to change the response ontology, from individual to collective scope. [4,5]

Concerning social vulnerability, it is constituted by life contexts that may increase the risks and the manifestation of the disease. This assumption highlights the necessity of vulnerability identification in order to define plans of action and health education, with the perspective of changing the conditioning life factors to risk and disease. [6]

Among vulnerable social segments, deaf people face difficulties related to life conditions and health care. Those people suffer the impact of social determinants related to low socioeconomic position, low educational levels, and challenges upon communication with health professionals. [7]

Added to such life conditions, there is the stigma of asexuality to victimize them. There are, in literature, reports of undue social beliefs about disabled people, as if they were unattractive and incapable of working. Disabled women are perceived by the families of potential spouses as a burden, incapable of getting pregnant, raising children or taking care of their husband. Furthermore, disabled women are vulnerable to rape, since perpetrators believe they cannot react. [8]

Besides the fact that such myths favor the exposure of that social segment to sexually transmitted infections, there are difficulties to access health care services, especially for deaf people, since most professionals do not have appropriate training and do not know Brazilian Sign Language (Libras). [9]

These negative attributes harm care provision to these users and hinder the health education process for sexually transmitted infection prevention. It must be highlighted, moreover, that Libras has different grammar and vocabulary from Portuguese. Thus, deaf people need greater care upon use of technical terms, so more attention is due for communication with this social group so they can take information in effectively.

Furthermore, technological evolution is rising and allows the use of new resources on health care practices, such as Information and Communication Technologies (ICT), making care more dynamic and seeking adequation to the peculiar needs of the deaf community. Thus, technological progress makes the construction of educational tools about several themes possible, using graphics, animation, sound, text and video. This visual pedagogy is fundamental for the effectiveness of bilingual educational practices, because it allows deaf people's learning in three bases, formed by text, image and video. [12]

In that perspective, this study aimed at developing and validating an educational video in Libras

for the health education of deaf people about AIDS and the ways it is transmitted.

Methods

Methodological development study carried out in 2016, at School of Audio-communication Demóstenes Cunha Lima (EDAC - *Escola de Audiocomunicação Demóstenes Cunha Lima*), partnered with the Association of Professional Translators and Interpreters of Campina Grande (APTILCG - *Associação de Profissionais Tradutores Intérpretes de Campina Grande*), and with the Social Communication Course of *Universidade Estadual da Paraíba* (CCS/UEPB), all located in the city of Campina Grande, Paraíba State, Brazil. It was intended to obtain an answer to the following guiding question: Is there validity evidence of a technology signaled in Libras to be used in health education processes for deaf people?

It must be highlighted that all ethical aspects of research involving human beings were preserved. It was made clear for all subjects who took part in video shooting that the video would be used for scientific ends, and all signed a consent affidavit for image use.

The Echer construction method for health care instruction manuals was adapted for the conduction of this study, following predetermined steps in order to make development easier, with quality and scientific rigor, as follows:

- 1st step – Review of specialized literature for selection of conceptual information and instructions about AIDS.
- 2nd step – Writing a script, based on the evidence of literature review and Health Ministry recommendations. Researchers selected script content, which was categorized in three blocks of statements, containing the items to be validated: Block 1 - "Knowledge", Item A) Sexually Transmitted Infections and the kinds of STI; Item B) What is HIV and what is AIDS; Item C) The immune system and what happens when it is harmed; Item D) How is HIV transmitted and contracted; Item E) Signs and symptoms after HIV contamination; Item F) Diagnosis, treatment and prevention. Block 2 – "Prevention", Item G) Condoms and other protection; and Block 3 – "Wrapping Up", where AIDS was approached as a public health problem.
- 3rd step – Video script validation. Five EDAC teachers and five CCS/UEPB students were selected. Each participant received a tool consisting of an adapted Likert scale, with five points, varying from terrible to excellent, as follows: 1 – Terrible; 2 – Bad; 3 – Insignificant; 4 – Good; and 5 – Excellent. Participants were informed they should mark an "X" in each item in the assessment tool, according to their understanding about the proposed items, and a day was scheduled for filled-in tools to be returned.
- 4th step – Shooting of the educational video signaled in Libras. A Libras interpreter was chosen in APTILCG who had, at least, three of the inclusion criteria: having Prolibras certification – proficiency exam that certifies Libras teachers, translators and interpreters; having a validated Translator and Interpreter course; having experience with audiovisual material and availability to be an extra/actor during shootings. Meanwhile, a student was chosen in CCS/UEPB who fulfilled the criteria: be enrolled for graduation course and attended at least 80% of the course hours. That participant had to voice over the whole video and assist on video shooting parameters.
  Shooting sessions were scheduled according to the interpreter's, the student's, and the researchers' availability, and they were carried out in an adequate location for shooting audiovisual material. Later on, the material was technically edited, to be assessed by specialists and by the group of deaf people.
- 5th step – Material validation by Libras specialists and by deaf individuals. This step was consolidated in three distinct moments:
  - 1st moment – Review of all the produced material, focusing on the correlation between selected information from literature and the acting images that were shot.

- 2nd moment – Validation of video content by Libras specialists. APTILCG was contacted again for the selection of five Libras specialists [14] who fulfilled at least three of the preestablished criteria: being a Libras translator/interpreter; being fluent in Libras; having Prolibras certification; and acting as an interpreter or translator of Libras in educational institutions. The specialists received the adapted Likert scale and were informed they should mark an "X" on each item of the assessment tool according to their understanding and proficiency in Libras. At this moment the video was shown, item by item with pauses, so the specialists could make a strict assessment. Therefore, assessment criteria were established: interpretation; sign adequation; dactylology adequation; and content clarity. Each criterium was assessed regarding its clarity, objectivity, execution time, comprehension and Libras adequation. Structural analysis of the video was also performed, thus participants assessed the Libras filming criteria: logical sequence; background; focus; framing; lighting; standards for video shooting targeting deaf audiences; video length; content comprehension; signaling and interpretation used by the interpreter; signaling and interpretation of content.
- 3rd moment – Video content validation by deaf subjects. Video assessment was made by a group of 18 deaf people selected in EDAC, considering the following criteria: being over 18 years old; being a high school student; and being fluent in Libras. Those were mandatory criteria because the video is meant to be used in educational action for deaf people in public schools and in Primary Heath Care, for groups of deaf people with those characteristics. The deaf participants were gathered in a room with one researcher and one interpreter. The video was shown to the deaf people with pauses, item by item, so assessment could be made. Criteria for each topic were: interpretation, comprehension, sign adequation and interpretation execution. Assessment was made by marking an "X" on the desired option of the Likert scale, according to the understanding of Libras, so each item could be rated: terrible (1), bad (2), insignificant (3), good (4), or excellent (5).

Once assessment was over, the tools were retrieved for statistical analysis, using the Statistical Package for the Social Sciences (SPSS) software. Agreement among judges and among deaf subjects, and the quantification of content validity were defined by the Content Validity Index (CVI), deriving from the Likert scale answered by judges and deaf subjects. CVI calculation was made by dividing the sum of answers 4 and 5 in agreement by the total number of answers. In order to be deemed valid, each tool item had to present CVI over 0.8. [15]

In order to verify the internal consistence between items there was the use of Cronbach's Alpha, which is meant to measure the reliability, the magnitude of correlation of tool items, so that values over 0.60 are appropriate for preliminary investigation, and values from 0.90 to 0.95 are considered excellent. [16]

The project was approved by the Research Ethics Committee of UEPB under CAAE n. 0700.0.133.000-11 and process n. 11.

Results

The study resulted in the development and validation of the educational video "Libras Communication: learning about AIDS", which is 20 minutes long. Regarding the internal consistence verification of the assessment tool, it obtained Cronbach's Alpha = 0.989 from judges and 0.634 from deaf subjects. For data analysis, the values corresponding to each item and to each criterium per item were verified, defining CVI values, according to table 1.

Regarding the general assessment of the video, made by the judges, psychometric criteria were considered as presented on table 2.

Concerning the assessment made by the group of deaf people, the final results are displayed on ta-

Table 1. Distribution of specialists' answer scores about psychometric criteria (n=5)

Psychometric criteria	Judge 1 %	Judge 2 %	Judge 3 %	Judge 4 %	Judge 5 %	CVI criteria	CVI item
Item A							
Interpretation	100	100	100	100	100	1	
Sign adequation	100	100	100	100	100	1	0.95
Dactylology	100	100	100	100	100	1	
Content clarity	100	100	100	100	0	0.8	
Item B							
Interpretation	100	100	100	75	50	0.85	
Sign adequation	100	100	100	100	100	1	0.92
Dactylology	100	100	100	100	75	0.95	
Content clarity	100	100	100	100	50	0.9	
Item C							
Interpretation	100	100	100	100	100	1	
Sign adequation	100	100	100	100	100	1	1
Dactylology	100	100	100	100	100	1	
Content clarity	100	100	100	100	100	1	
Item D							
Interpretation	100	100	100	100	75	0.95	
Sign adequation	100	100	100	100	100	1	0.97
Dactylology	100	100	100	100	100	1	
Content clarity	100	100	100	100	75	0.95	
Item E							
Interpretation	100	100	75	100	50	0.85	
Sign adequation	100	100	100	100	100	1	0.95
Dactylology	100	100	100	100	100	1	
Content clarity	100	100	100	100	75	0.95	
Item F							
Interpretation	100	100	100	100	50	0.90	
Sign adequation	100	100	100	100	100	1	0.96
Dactylology	100	100	100	100	100	1	
Content clarity	100	100	100	100	75	0.95	
Item G							
Interpretation	100	100	100	100	75	0.95	
Sign adequation	100	100	100	100	100	1	0.97
Dactylology	100	100	100	100	100	1	
Content clarity	100	100	100	100	75	0.95	

Table 2. Distribution of specialists' answers about psychometric criteria of general assessment of the video (n=5)

Psychometric criteria	Judges %	CVI criteria	CVI general
Chronology	100	1	
Background	80	0.80	
Focus	100	1	
Framing	80	0.80	
Lighting	100	1	0.90
Standard for video shooting in Libras	60	0.60	
Total length	80	0.80	
Comprehension	100	1	
Interpreter's signaling and interpretation	100	1	
Content signaling and interpretation	100	1	

ble 3, where CVI values were obtained by criterium and by item. The table comprises the psychometric criteria related to items A, B, C, D, E, F and G, followed by the assessment made by the judges according to Likert scale, wherein for each psychometric criterium was related the quantitative from deaf evaluators, who deemed values according to their understanding of Libras.

Table 3. Distribution of deaf subjects' answer scores about psychometric criteria (n=18)

Psychometric criteria	Likert Scale Result 1	2	3	4	5	CVI criteria	CVI item
Item A							
Interpretation	5	0	2	1	10	0.72	
Comprehension	0	1	4	6	7	0.94	0.78
Sign adequation	1	6	2	5	4	0.61	
Execution	2	1	8	0	7	0.83	
Item B							
Interpretation	3	0	4	7	4	0.83	
Comprehension	0	2	1	7	8	0.88	0.84
Sign adequation	0	0	8	4	6	1	
Execution	0	6	4	4	4	0.66	
Item C							
Interpretation	1	1	4	4	8	0.88	
Comprehension	1	2	2	6	7	0.83	0.88
Sign adequation	0	2	6	2	8	0.88	
Execution	0	1	4	8	5	0.94	
Item D							
Interpretation	3	2	6	3	4	0.72	
Comprehension	0	3	7	2	6	0.83	0.84
Sign adequation	0	0	6	7	5	1	
Execution	1	2	4	5	6	0.83	
Item E							
Interpretation	2	0	3	5	8	0.88	
Comprehension	2	1	1	8	6	0.83	0.91
Sign adequation	0	0	5	6	7	1	
Execution	0	0	4	7	7	1	
Item F							
Interpretation	0	2	1	7	8	0.88	
Comprehension	0	0	1	11	6	1	0.91
Sign adequation	1	0	2	5	10	0.94	
Execution	3	0	1	9	5	0.83	
Item G							
Interpretation	1	0	2	5	10	0.94	
Comprehension	1	0	0	11	6	0.94	0.92
Sign adequation	2	0	1	10	5	0.88	
Execution	1	0	1	8	8	0.94	

1 – Terrible; 2 – Bad; 3 – Insignificant; 4 – Good; 5 – Excellent

Discussion

The development of educational technology about HIV and AIDS targeting an audience of deaf people emerged from the necessity to expand health information that is pertinent and adequate to that population, thus aiming to solve health care gaps rising from a communication deficit, which is caused by

most professionals' lack of Libras knowledge. The study used the content validation process, however it is necessary that the video and its items be submitted to other validation levels, such as clinical testing and construct validation.

Educational technologies scoped on health are presented as facilitating tools in the teaching-learning process and are used as a means to share knowledge, allowing individuals to exchange experiences that lead to skill improvement. Thus, educational technology is seen as a tool to be used by health care professionals in their daily practice, in order to promote prevention through health education. [17,18]

According to the results obtained through analysis, the value related to Cronbach's Alpha in specialists' assessment can be considered as equivalent to very high internal consistence, thus it is a positive assessment of the magnitude of tool items, corroborating other specialized analysis. [16]

Concerning the Alpha found through deaf subjects' assessment, validation studies previously developed with similar data assert that the value can be considered adequate when it comes to a tool with few items, such as Likert scales. [16,19]

Regarding video validity and its representativeness by the judges, this study went alongside other authors that versed on tool content validation in health research. It was noticed that the specialists' answer distribution about psychometric criteria obtained CVI, both by item and by criteria, as recommended by literature, where all are valued equal or higher than the standard cutoff mark. [15,20-22]

In relation to the validation of specialists' answer distribution about psychometric criteria for general assessment of the video, there was an effort to assess structure and execution. In that sense, generally satisfactory CVI were obtained. Nevertheless, only for the criteria "Standard for Libras video shooting" CVI was below recommendation, indicating the need for higher adequation and rigor on adopted standards for audiovisual communication with the public.

However, attention can be drawn to the fact that assessments about the standard for shooting videos in Libras may vary among areas in the country, and they were submitted to the analysis of a restricted group of experts. Therefore, this limitation is observed in spite of global CVI being satisfactory, what granted validity and reliability to the video.

In what refers to content validation made by the target public, only item "A" was assessed below the cutoff mark. However, some authors recommend, in order to ensure representativeness in an assessment carried out with six subjects or more, values no lower than 0.78.[23,24] Thus, item A may also be considered as valid and representative, since it did not harm the tool globally.

This investigation is in step with another study that aimed at validating the content of signs, symptoms and diseases/health care grievances expressed in Libras by deaf people, wherein 33 expressions were assessed and 28 of them obtained satisfactory CVI, thus being deemed representative and valid. [25]

It must be emphasized that content validity is of utmost importance on tool development and adaptation processes. The reports of another study are corroborated as it implicates that the methodology in use may subsidize the development of technology that is attractive and comprehensive to the deaf public, what may facilitate the production of other technologies linked to education, focused on this theme or on any other that involves health care and attention. [26,27]

Throughout the development of this study, the absence of signs for many terms of the health field was observed, so only dactylology is used. Faced with that, it is necessary to improve and develop other studies from a theoretical/epistemological perspective, in order to fill in the gaps caused by communication difficulties in the health field.

It is important to highlight the potentialities of validation developed in this study, which may be understood focusing on improvement to communication between deaf people and health care professionals, thus contributing to the quality of health care offered to this social segment. Moreover, the video may be used in extension projects aiming at education and health care promotion, extending its usefulness to school and community environments.

Therefore, the video is relevant to facilitate the teaching and learning of communication with deaf people, and to assist on actions of self-care, health promotion and disease prevention. This characteristic defines the developed material as an innovative technology that answers to the principle of comprehensiveness of health care, where it may be an effective tool in the health care provided by nurses, who are active members on health promotion and prevention processes with the population. That statement is reaffirmed by a study that was developed in primary care, with sample groups of deaf people and nurses, in a virtual environment that focused the treatment of hypertension and diabetes type 2. Even without interpreters, the environment had excellent acceptance by both sample groups, allowing the interaction between them, shortening appointment time in 15 minutes and preserving patient privacy. [28]

Conclusion

The objective of developing and validating an educational technology was reached, both in content and form. The video "Communication in Libras: learning about AIDS" obtained psychometric scores that are compatible with proposed acceptability indexes in literature, presenting validity and representativeness measured by specialists and by the deaf people who took part in the study, so it may be used in the health care and in the health education processes of the target population.

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Collaborations

Magalhães IMO, França ISX, Coura AS, Aragão JS, Silva AFR, Santos SR, Basílio EEF e Sousa FS contributed to project conception, data analysis and interpretation, article writing, critical review of intellectual content and final approval of the publication version.

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