Cogitare Enfermagem

ORIGINAL ARTICLE

Translation and cross-cultural adaptation of a serial album on infant food safety into the Tsonga language*

HIGHLIGHTS

1. Mozambique needs educational resources suitable for the rural public.
2. Translation and cross-cultural adaptation of resource into Tsonga (Changana) language.
3. Food education for families with young children who are not breastfed.
4. Open educational technology increases accessibility and social and clinical impact.

Florência Paulo Nhanengue Timbane[1]
Stela Maris de Mello Padoin[1]
Marcelo Ribeiro Primeira[1]
Alexandre António Timbane[2]
Ezra Alberto Chambal Nhampoca[3]
Cristiane Cardoso de Paula[1]

ABSTRACT

Objective: To describe the process of translating and culturally adapting the textual and visual content of the album series on food safety for non-breastfed infants under six months of age into the Tsonga (Changana) language. **Method:** A development and innovation study conducted in four stages: 1) translation from Portuguese to Changana (versions T1 and T2); 2) synthesis of the translations (version T12); 3) back-translation; and 4) committee meeting (analysis of text fidelity). The adaptation of the images involved consultants from Mozambique and designers. **Results:** The Via Láctea album maintained the three types of milk from the original version and adjusted the feeding utensils. The color palette and clothing were adapted to the target audience. The educational resource was registered and made available as open access. **Conclusion:** The cross-cultural adaptation for the rural Mozambican context, where Portuguese is not spoken by everyone, has the potential for replicability and for clinical and social impact through the translation of knowledge.

DESCRIPTORS: Food Security; Infant Health; Child Health; Infectious Disease Transmission, Vertical; Translating.

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[1]Universidade Federal de Santa Maria, Programa de Pós-Graduação em Enfermagem, Santa Maria, RS, Brasil.
[2]Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Redenção, CE, Brasil.
[3]Universidade Eduardo Mondlane, Maputo, Moçambique.

INTRODUCTION

The World Health Organization (WHO) guidelines on exclusive breastfeeding (EBF) recommend its practice from birth; however, in Mozambique, this practice is observed in only three-quarters of infants during their first month of life. It is also noted that the prevalence of EBF declines with age, reaching only one in three infants in the age group of four to five months. Additionally, the data indicate that a quarter of children between zero and 23 months of age are bottle-fed[1].

The contraindications for EBF are limited to conditions such as maternal HIV or HTLV- 1/2 infections and the use of incompatible drugs, such as chemotherapy agents. Although EBF has made progress, with a 14.5% increase since 2013, the loss of the biological mother (often due to AIDS, malaria, or malnutrition) leaves orphans vulnerable to early weaning and malnutrition[2-4].

The Child Nutrition Policy[5] and the Strategic Plan to Fight HIV[2] prioritize children, pregnant women, and breastfeeding mothers living with HIV. This prioritization has become a central feature of public health responses in Mozambique and has been systematically advanced since the approval of the first National Strategic Plan in 2000. Since then, successive plans and policies have placed a strong emphasis on combined prevention. However, the effectiveness of these interventions faces significant geographic barriers: while 21% of women in urban areas received counseling on child nutrition in the past six months during the 2022–2023 period, the rate dropped to 8% in rural areas, where the fragility of the health system hinders the continuous dissemination of information[1].

Therefore, it is clear that there is a need to develop strategies to ensure the protection of children under six months of age who are not breastfed. Among these strategies is the translation of knowledge[6] as a facilitator of food and nutrition education (FNE) through educational resources, especially when addressing complex issues such as the feeding of non-breastfed children. In addition to the scarcity of guidelines, recommendations vary according to social, cultural, and traditional customs[7]. In this regard, we observe a society permeated by myths and traditions that, in many cases, do not promote healthy public health practices.

It highlights that low rates of EBF may be attributed to conflicting messages, partly due to the fact that Africa, in previous policies, had adopted WHO recommendations for the use of breast milk substitutes, provided they could be supplied sustainably, prepared safely, and were nutritionally adequate[8]. Under these special circumstances, success depends on the use of infant formula (or another type of milk) in a way that is accessible, acceptable, feasible, safe, and sustainable - that is, prepared under ideal conditions, with access to safe drinking water and basic sanitation, and provided adequately, hygienically, and in sufficient quantity and frequency to support the child's growth and development.

In light of this, effective FNE can be achieved if it is conducted in the local language. The importance of adapting to the specific Mozambican context goes beyond the fact that Portuguese is the only official language of Mozambique, amidst more than twenty Bantu languages spoken by the majority of the population, especially in rural areas. Information on Public health, package inserts, booklets, pamphlets, and other preventive guidelines are often written in Portuguese, which poses a barrier to understanding for those who use Bantu languages, including Mozambican Sign Language. In this regard, it should be noted that the right to information and public health is guaranteed by the Constitution of the Republic of Mozambique (2004)[9], and is directly aligned with the 2030 Agenda and the Sustainable Development Goals (SDGs), with special emphasis on the areas of health, nutrition, and the reduction of inequalities.

The Changana language is one of the Bantu languages of the Tswa-Ronga linguistic group, spoken in southern Mozambique and in three neighboring countries (Eswatini, South Africa, and Zimbabwe). It is believed that materials produced in Bantu languages would have greater reach and be better understood in these regions, since the language is the primary means of communication. Furthermore, it is fundamental to understand that language embodies cultural meanings: words carry semantic values that are interpreted through the lens of the culture itself. This study, therefore, aimed to describe the process of translation and cultural adaptation of the textual and visual content of the series of booklets on food security for non-breastfed infants under six months of age into the Tsonga (Changana) language.

METHOD

This cross-cultural adaptation study[10] is part of a multicenter project[11] based on the Canadian *Knowledge-to-Action* conceptual model. When identifying the gap between knowledge and action, the research focused on knowledge translation, which enables the creation of interventions tailored to specific groups. Within the scope of the multicenter project, this stage constitutes the first phase of the knowledge translation cycle (Figure 1)[12].

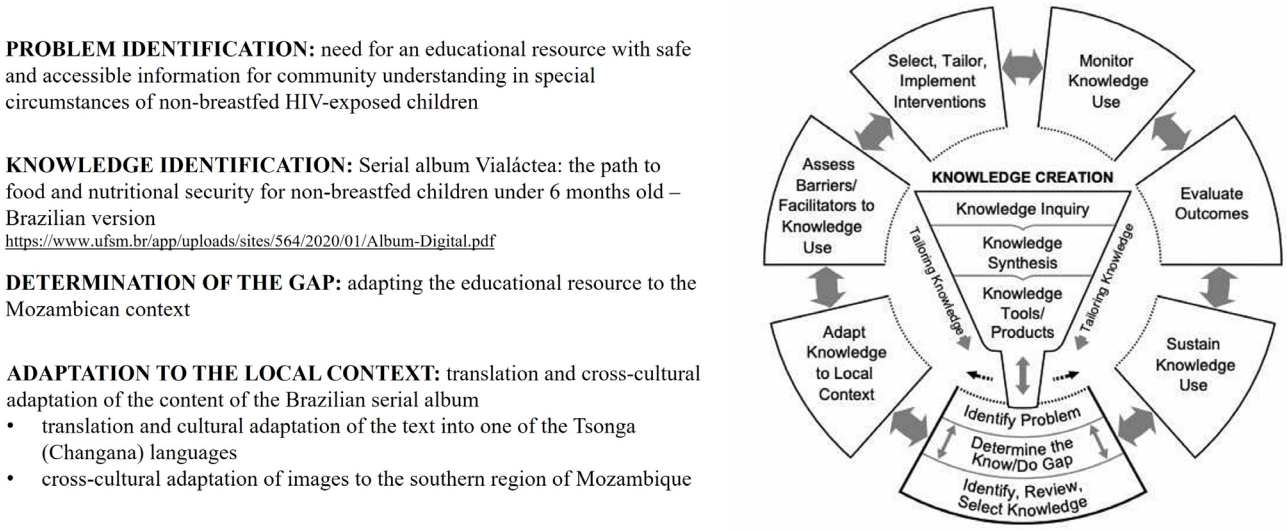


Figure 1. Application of the knowledge adaptation phase to the local context in the Knowledge Translation Project. Santa Maria, RS, Brazil, 2024

Source: Reproduced[6,12].

In the present study, the cross-cultural adaptation was tailored to the Mozambican context, and the Brazilian open-access educational technology[11], in the form of a serial album, was applied to the care of non-breastfed infants under six months of age. Translation and cross-cultural adaptation are technical-scientific processes that use linguistic adaptation methods, enabling interpretation or translation in accordance with the sociocultural reality of the speakers. When translating information for a specific group in a particular territory, the translation must align with the language and sociocultural nuances of the speakers within that culture. Thus, five stages of the *checklist* for translation and cross-cultural adaptation[10] were developed: 1) preparation; 2) translation; 3) reconciliation of translations; 4) back-translation; and 5) revision (Figure 2).

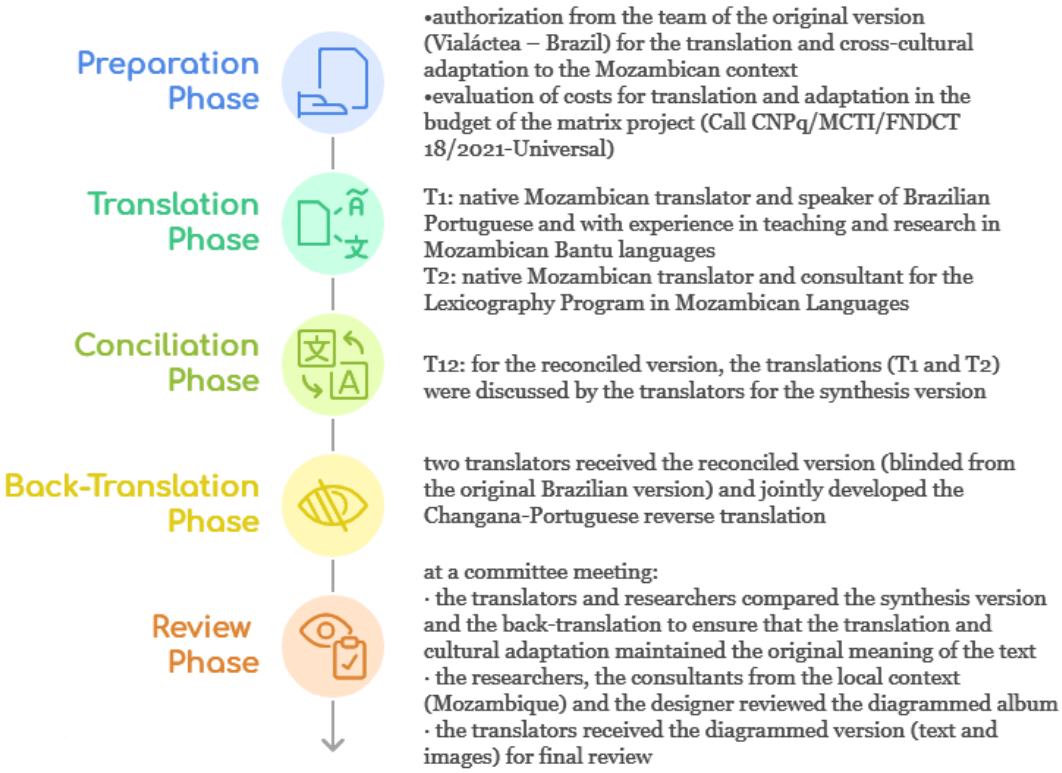


Figure 2. Stages of Translation and Cross-Cultural Adaptation of the Textual Content of the Brazilian Milky Way Serial Album for Southern Mozambique. Santa Maria, RS, Brazil, 2024

Source: The authors (2024).

A team was formed to adapt the images from the Via Láctea series of albums, consisting of six members: the project coordinator, the knowledge translation consultant, the designer, and three consultants (graduate students of Mozambican origin). Virtual consensus-building meetings were held, the minutes of which were recorded by the project coordinator (the study's advisor) and shared with the team via cloud storage.

At the first meeting, after the participants were introduced, images from the original (Brazilian) version were presented, and discussions were held with the aim of adapting them. Subsequent meetings focused on determining which images would be appropriate for the picture book series and how well they corresponded to Mozambican reality. These discussions were crucial for adjusting the clothing depicted to reflect local cultural norms, ensuring that the translated content met the criteria for cross-cultural adaptation.

The consultants shared images (under open-use licenses) as references so that the designer could grasp the cultural characteristics necessary for the adaptation, such as skin tones, hair, clothing, and eating utensils, among others. Thus, with the aim of bringing the content closer to the Mozambican reality, the designer adapted the original images, taking care to adjust the depictions of people and their clothing according to the consultants' suggestions. As a result, a consensus was reached regarding the adjusted images.

From the redesign of the family illustration, the remaining visual elements were created and submitted for review by the consultants, who discussed them in a private group on an instant messaging app (*WhatsApp*®), which led to additional adjustments. After the images were approved, the designer finalized the color palette, which reflects African diversity and is integrated into the visual identity of the Mozambican version. Thus, the final version was approved to complete the layout of the serialized album

in two versions: one printed and one digital. Both are available via an open-access institutional domain: https://www.ufsm.br/app/uploads/sites/564/2020/01/VM-Album-Versao-Mocambique-Digital.pdf.

Given that cross-cultural adaptation prioritizes semantic, idiomatic, and cultural equivalence, and that the guidelines for the care of non-breastfed children are based on international protocols (WHO/UNICEF) adopted in Brazil and Mozambique, the technical content has not undergone any substantial changes. The changes were limited to terminological and iconographic adaptations to ensure comprehensibility in the Mozambican context. It should be noted that the original Brazilian version underwent a rigorous validation process by experts during its development[11]. Since the theoretical construct, scientific evidence, and educational objectives remain unchanged, content validity is considered to be preserved.

In this context, the thorough review conducted by specialized committees and language reviewers addresses the need for a new psychometric validation, since the focus of the adaptation was on the accessibility of the message and not on changing the health behaviors presented. It is worth noting that the pretest with the target audience, composed of family members of non-breastfed infants under six months of age, will be conducted in a subsequent phase as an extension of the main project. This research will take place through an *in loco* study in a rural region of Mozambique, aiming to consolidate the practical applicability of the technology in contexts of specific vulnerability.

Both versions (one printed and one digital) include cataloging-in-publication data produced by the Institutional Library and an *International Standard Book Number* (ISBN) registration. The work was registered on the Portal de Obras as literary work No. [312252476].

In accordance with the ethical guidelines of the National Health Council, this research was exempt from review by the Research Ethics Committee (CEP). This decision is based on Resolution No. 510/2016 (Art. 1, sole paragraph, item VII), as this is a study focused on the "theoretical exploration of situations that arise spontaneously and contingently in professional practice," without identifying the subjects. This interpretation is reinforced by Resolution No. 674/2022 (Chapter IX, Art. 26, item VII).

RESULTS

The album series, originally titled in the Brazilian version Via Láctea: The Path to Food and Nutritional Security for Non-Breastfed Children Under 6 Months, was translated as *Albu Nlongoloko Majela Ya Let: Ndlela ya majela manene ni mpamelo wunene ka vatsongwana vokala kuyan'wisiwa, va ntangha ya le hansi ka ntlhanu wa tihweti ni yin'we*. The title containing the expression "Álbum Seriado Via Láctea" was deemed untranslatable into Changana by the translators. In such cases, the translation team resorted to lexical borrowings and foreign loanwords, a common practice in Bantu languages. Several loanwords were necessary because there was no equivalent lexical unit in Changana, as they describe new realities resulting from the expansion of new technologies.

In the album's content, the three types of milk were retained as they appear in the original version (infant formula, cow's milk, and powdered milk), as were the utensils used to serve the milk (baby bottle, cup), while the measuring spoon was omitted (Figure 3).



Figure 3. Adaptation of the decision tree of types of milk and utensils for feeding the child from the Brazilian Milky Way Serial Album to the South of Mozambique. Santa Maria, RS, Brazil, 2024

Source: The authors (2024).

For the translators, the word "formula" had no cultural relevance in the Changana language. By consensus, it was decided that the term "formula" should be reinterpreted as *letimapa la nwana* in order to refer to this new reality, which lacks an adequate representation in the Changana language, especially for rural families, who are the focus of this translation. Another important aspect is the use of less formal words in rural contexts.

Discussions about the expression "powdered milk" revealed the need to translate it as *letimapa*, since, in the context of the Changana language, milk is considered a liquid and not a powder. Although there is a term for "liquid milk," there is no specific term for "powdered milk," which represents a linguistic novelty. Thus, an adaptation was sought that makes use of a lexical loan from Portuguese, combining *leti* (milk) and *mapa* (powder). The Changana-Portuguese dictionary does not include this entry, which required the translators to make a cross-cultural adaptation so that this new reality would make sense in the Changana language. As a result of this analysis, the lexical unit *letimapa* can be understood by the speech community.

During the translators' meetings, it was possible to resolve lexical and orthographic discrepancies, which posed a major challenge. It was also noted that, due to the closeness of the Changana language to *Ronga* and *Xitswa*, linguistic influences were evident. The translators, however, had to discuss and decide on grammatical choices, with an emphasis on lexical, semantic, and syntactic aspects. Thus, it became essential to consider the terminology in use in Mozambique to ensure a connection between the original text and the sociocultural reality of the speakers. Although translation requires the creation of a new text, it is essential to preserve the essence of the original content.

The questions, guidelines, tips, and warnings were translated and culturally adapted to the context of the local language. The use of "loanwords" and "foreign terms" was important in specific cases, such as "garfo" (adapted as *garfu*), "vitaminas" (adapted as *mavhitamina*), and "minerais" (adapted as *maminerali*). The prefix *ma* (class 6) is a prefix used in Bantu languages to indicate the plural form of certain nouns. All translation attempts were challenging, as there are no corresponding words in Changana for certain concepts, making the use of loanwords and foreign terms useful in such cases.

The translation of the term "measuring cup" required an extensive discussion among the team to find a term that would ensure understanding by speakers, regardless of

their level of education. The translation *copu ya kupima ha yona* was chosen precisely to avoid altering the original content. It is worth noting that this term caused hesitation among the back-translators, which underscored the need to hold periodic meetings to discuss health terminology or make comparisons.

The color palette of the images was adapted to match the skin and hair tones of the target audience. The clothing and the depiction of the introduction to solid foods—in which a Brazilian child was holding a broccoli floret—were changed to show a child holding a mango, in order to reflect the daily lives of Mozambican families, especially in rural areas (Figure 4).



Figure 4. Cross-cultural adaptation of the imagery content of the Brazilian Milky Way Serial Album to the South of Mozambique. Santa Maria, RS, Brazil, 2024

Source: The authors (2024).

The adaptation of the characters took skin tone into account: the brown-skinned grandmother and child, and the white father and baby, were given features reflecting African cultural identity, along with the mother, who was already black in the original version. Hair characteristics (shape, color, length) were also adapted. Furthermore, for the female characters, *capulana* was used on the head, wrapped around the body, and to carry the baby in the arms. The *capulana* cloth is used by women to wrap around their bodies, but it can also be used to make traditional African clothing and to carry children, playing an important role in the culture and daily lives of Mozambican women.

The adaptation of the images involved clothing, colors, and fabrics, and open-toed shoes were replaced with closed-toe ones. The cloth diaper on the baby—which is traditionally used in that region—was retained.The baby's feeding table was also adapted to reflect local conditions. Regarding utensils, the measuring spoon was removed from all images in which it appeared to illustrate preparation and/or hygiene guidelines for feeding milk, and the milk bottle was replaced with a pot and its color changed to make it more recognizable to the target population.

The digital version is available on an institutional open-access domain (https://www.ufsm.br/app/uploads/sites/564/2020/01/VM-Album-Versao-Mocambique-Digital.pdf), linked to the Educational Platform for the Health Care of Individuals, Families, and Society (PEFAS+), which serves as a communication channel between the university and the community, featuring research findings translated into educational resources based on scientific evidence.

DISCUSSION

The translation of educational resources differs from the translation of academic texts or psychometric instruments, for which methods and techniques are frequently described in the literature. In the present study, it was important to consider that being a native speaker of the target language did not necessarily imply the ability to translate, particularly in the case of Mozambican Bantu languages, since these were unwritten for centuries and their spelling was standardized only in 2008.

This turned the process of writing the translation into a complex and challenging task, since, although translation requires the creation of a new text, it is necessary to preserve the essence of the content[13], especially in the field of health, where the meaning of words can alter the guidance professionals provide to users. Thus, one must consider the cultural mediation of the translator, who conveys the values, uniqueness, and identity of the source text and culture.

For this reason, consensus among translators is essential for recognizing differences in lexical choices, especially regarding health terminology that has not yet been standardized in the target language. It is important to consider the varieties as they are used by the communities that speak them, distinguishing between their meanings, rather than specifically discussing the standardization of linguistic or orthographic varieties, as was the case in the context of Mozambique. Furthermore, when there is no semantic equivalence, it is necessary to use "language borrowings," such as "Portuguese-ization" in the present study, with "foreign loanwords" sometimes being applied[14].

Since Bantu languages lacked a written tradition, the process of translating the textual content of educational resources is challenging and requires meticulous attention to detail, presenting obstacles to the promotion of linguistic justice[15]. This justice encompasses an individual's right to communicate in their preferred language, while also aiming to promote health equity. Thus, it is essential that the target audience of the educational resource recognize themselves and their context so that the illustrations make sense, allowing readers to connect with the content in order to interpret and understand it[16]. The image constitutes a text in and of itself and must be in harmony with the written content[17], since, when presented with a visual and written text[18], people will always tend to read the visual first.

The translation and cross-cultural adaptation of educational technologies overcome linguistic and contextual barriers, as demonstrated by the process applied to the *Play Nicely Program*[19] for Brazil, which ensured the semantic and cultural equivalence of concepts related to healthy discipline. Such methodology increased the acceptability and effectiveness of the educational technology among the target audience, promoting parents' and caregivers' identification with positive care practices and strengthening the use of validated tools in health education.

The rigor of the methodological process of cross-cultural adaptation is also exemplified by the *Go Wish Game*[20], a game about advance care planning and personal values that went beyond mere linguistic translation, ensuring that concepts and values resonated authentically with the local context. This rigorous process ensures the tool's comprehensibility and ethical sensitivity, resulting in greater engagement from the target audience and facilitating complex dialogues.

Another example of translation and cross-cultural adaptation that underscores the need to go beyond mere linguistic conversion was the process applied to the *Caja de Instrumentos de Pérdida Auditiva*[21], which rigorously tailored the tools to the psychosocial and functional contexts of the target audience. This approach, which integrates culture, language, and health literacy, serves as a positive step toward reducing barriers to

access and promoting equity in care. Furthermore, a scoping review indicated that the translation and transcultural adaptation of health interventions with nutritional components for indigenous populations requires moving beyond literal translation, focusing instead on integrating traditional knowledge and addressing the reality of socioeconomic vulnerability[22].

A rigorous process of translation and cultural adaptation highlights the relevance and acceptability of educational technologies, respecting the language, context, and local customs, resulting in greater effectiveness in promoting changes in dietary behavior, for example. Therefore, cross-cultural adaptation is not merely a technical step but an essential element in the implementation of educational strategies that seek therapeutic equity in culturally diverse settings[22-23].

Thus, providing evidence-based information—in language appropriate for the target audience and culturally adapted to the context—can help overcome the barrier of information complexity and encourage people to engage in their own health care. This also promotes health literacy, which means fostering a better understanding of information with the goal of improving informed decision-making processes regarding health[24]. For this reason, it was essential to use less formal language in the open educational resource for nutrition education, culturally adapted to the rural context of Mozambique.

Health literacy[25] refers to the knowledge and skills acquired through daily and social interactions, mediated by organizational structures and available resources, which should ensure access to reliable and understandable information. It is a result of health education and is influenced by cultural and situational demands; it is not the sole responsibility of individuals. Thus, health literacy is considered essential for making informed decisions, empowering individuals and communities.

Furthermore, health literacy is an emerging area of interest on the African continent: 336 documents included in a scoping review[26] demonstrate its importance for research, policy, and practice in Africa, in communities and settings beyond the health sector. The study emphasized maternal health due to the high risk of childhood morbidity and mortality, in line with the thematic focus of the resource translated and adapted in this study for an audience consisting of family members of children under six months of age, a population vulnerable to food and nutritional insecurity, especially in situations where breastfeeding is not practiced[27]. The review demonstrates the importance of collaborating with community leaders, religious leaders, and traditional healers to promote health literacy[26]. These trusted individuals serve as mediators and can help disseminate information and encourage positive health behaviors, facilitating the implementation of best-practice interventions and enhancing the promotion of health literacy.

Social technologies in health care, co-designed and community-led, have gained recognition as an effective strategy for addressing health issues through more effective and sustainable health outcomes. These technologies, especially for vulnerable populations, combine technical and scientific knowledge with traditional wisdom and, unlike high-cost technologies, are accessible, sustainable, and aim to promote social inclusion, health promotion, and improved quality of life[28]. By building connections and advocating for citizens' interests, mediators in the community support network can break down barriers to access to health information and education[29].

CONCLUSION

The adaptation of a health technology with a social focus facilitates the safer dissemination of information on child nutrition across different cultural and linguistic

contexts. In the local Mozambican context, although Portuguese is the only official language, communication in rural areas is mediated by Bantu languages. Thus, taking into account the characteristics and specificities of the local context, as expressed through textual content (in the Changana language) and visual content (illustrations), promotes health literacy among families of non-breastfed young children and their community support network.

The study's limitations stem from the difficulty of recruiting bilingual translators. The decision to use bilingual individuals with expertise in linguistics—while useful for the technical aspects of translation in assessing specific details—is highly unlikely to represent the target audience: women living with HIV and their families. This reinforces the need for future research to conduct a pilot study with the target audience of this resource in the next phase of the multicenter project, which could include an *audiobook* format to meet the needs of family members who are visually impaired or illiterate, thereby promoting autonomy in the care and food security of young children.

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Corresponding author:
Cristiane Cardoso de Paula
Universidade Federal de Santa Maria
Av. Roraima nº 1000, Cidade Universitária, Bairro Camobi, Santa Maria - RS, Brasil. CEP: 97105-900
E-mail: cristiane.paula@ufsm.br

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