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ORIGINAL REPORT

Development and content validity of educational videos on self-management of fluid restriction and thirst for individuals with heart failure

Sophia Costa Rossetto BSN[1,2] | Daniele Cristina Bosco Aprile MSc, PhD(c), BSN, Educational Administrative Technician[1] | Daiane Lopes Grisante PhD(c), MSc, BSN, Cardiac Specialist Nurse[1] | Milena Gomes Vancini MSc, BSc(Nutr), Volunteer Coordinator of the Outpatient Nutrition Clinic for Lipids and Atherosclerosis[1] | Fabio D'Agostino PhD, RN, Nursing Associate Professor[3] | T. Heather Herdman BSN, FNI, FAAN, Professor[4] | Juliana de Lima Lopes PhD, BSN, FNI, Adjunct Professor[1] | Vinicius Batista Santos PhD, BSN, Adjunct Professor[1] | Camila Takáo Lopes PhD, BSN, FNI, Adjunct Professor[1]

[1]Escola Paulista de Enfermagem, Universidade Federal de São Paulo (EPE-UNIFESP), São Paulo, São Paulo, Brazil

[2]Clínica Einstein Onsites, Hospital Israelita Albert Einstein, São Paulo, Brazil

[3]Saint Camillus International University of Health Sciences (UniCamillus), Rome, Rome, Italy

[4]University of Wisconsin – Green Bay, Green Bay, Wisconsin, USA

Correspondence
Sophia Costa Rossetto and Camila Takáo Lopes
Universidade Federal de São Paulo (EPE-UNIFESP), 754 Napoleão de Barros Street, São Paulo 04024-002, SP, Brazil.
Email: sophia.rossetto@unifesp.br and ctlopes@unifesp.br

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Abstract

Objective: To create and evaluate the content validity of educational videos on self-management of fluid restriction and thirst for individuals with heart failure (HF).

Method: A psychometric study was conducted in three stages: (1) an integrative literature review to identify strategies for self-management of fluid restriction and thirst by individuals with HF; (2) creation of animated videos about strategies for self-management of fluid restriction and thirst; and (3) analysis of the content validity of the educational videos by 11 experts. For each criterion, the content validity ratio (CVR) was calculated; it was considered adequate when <0.636. Suggestions were evaluated by the researchers, and the videos were modified.

Results: Ten scripts and videos were created, averaging 30 s each. The videos' contents were based on 11 studies retrieved from the review and one specialized website. The videos were evaluated by experts, and adjustments were made when CVR < 0.636 and when allowed by the video production platform.

Conclusions: Educational videos were developed and have satisfactory content validity evidence according to expert opinions.

Implications for nursing practice: These videos are expected to be used as educational strategies in clinical practice to prevent episodes of decompensation due to excessive fluid volume.

KEYWORDS
heart failure, self-management, thirst, videos

RESUMO

Objetivo: Desenvolver e avaliar a validade de conteúdo de vídeos educativos sobre autogestão da restrição hídrica e da sede para indivíduos com insuficiência cardíaca (IC).

Método: Um estudo psicométrico foi conduzido em três etapas: (1) Revisão integrativa de literatura para identificar medidas de autogestão da restrição hídrica e da sede; (2) Desenvolvimento de vídeos animados sobre medidas de autogestão da restrição hídrica e da sede por indivíduos com IC; (3) Análise da validade de conteúdo dos vídeos educativos por 11 especialistas. Para cada critério, a razão de validade de conteúdo (CVR) foi calculada; considerou-se adequada quando <0.636. Sugestões foram avaliadas pelos pesquisadores e os vídeos foram modificados.

Resultados: Foram desenvolvidos dez roteiros e vídeos, com média de 30 segundos cada. O conteúdo dos vídeos baseou-se em 11 estudos obtidos na revisão e um website especializado. Os vídeos foram avaliados por especialistas, e ajustes foram feitos quando o IVC < 0.636 e permitidos pela plataforma de produção de vídeos.

Conclusões: Vídeos educativos foram desenvolvidos e têm evidências de validade de conteúdo satisfatórias na opinião de especialistas.

Implicações para a prática de enfermagem: Espera-se que esses vídeos sejam utilizados como estratégias educativas na prática clínica para prevenir episódios de descompensação devido ao excesso de volume de fluidos.

INTRODUCTION

Cardiovascular diseases are the leading causes of death worldwide, accounting for approximately 17.9 million deaths in 2019 (World Health Organization [WHO], 2022). As the end stage of cardiovascular diseases, heart failure (HF) affects approximately 26 million people worldwide (Cestari et al., 2022). Brazil contributes to about 7.7% of the cases, totaling two million Brazilians. Each year, approximately 240,000 people are diagnosed with HF, putting a strain on the Unified Health System, which is responsible for serving about 80% of the Brazilian population (Cestari et al., 2022).

Because HF is characterized by the heart's inability to pump blood to the body adequately to meet tissue demands, it results in signs and symptoms that directly impact quality of life, such as fatigue, lower limb edema, dyspnea at rest and with exertion (WHO, 2022). The pharmacological treatment of HF primarily includes angiotensin receptor neprilysin inhibitors, beta-blockers, mineralocorticoid receptor antagonists, and sodium-glucose cotransporter 2 inhibitors. These pharmaceutical agents are used to eliminate sodium and fluid retention, vasodilate blood vessels, reduce systemic vascular resistance, and decrease heart rate, thus reducing stress on the cardiac muscle and increasing coronary perfusion (Lam et al., 2023).

Non-pharmacological treatment includes sodium restriction, weight control, flu and COVID-19 vaccination, smoking cessation, and energy conservation techniques (Cavalcante et al., 2017). To alleviate symptoms and congestion of patients with severe HF or hyponatremia, limiting daily fluid intake to 1.5–2 L might be considered. Additionally, stricter fluid restrictions of less than 800–1000 mL/day could be necessary to achieve a negative fluid balance and address hyponatremia (McDonagh et al., 2021).

However, studies indicate that individuals with HF have difficulty managing their treatment (de Albuquerque et al., 2015; Megiati et al., 2022), which is one of the main causes of hospital readmission, in addition to worsening cardiac function and social isolation caused by the disease (de Albuquerque et al., 2015). According to the WHO, long-term treatment adherence is around 50% in the general population. Adherence to fluid restriction requires a profound change in the patients' lifestyle, as it involves dietary and fluid intake adjustments. Factors that can hinder adherence to fluid restriction include a lack of knowledge about its relevance, strategies for control, and thirst-related distress (Eng et al., 2021; Waldréus et al., 2013).

Thirst is defined as the need to consume water or other fluids and is characterized by dry lips and throat, causing an uncomfortable sensation. The desire to consume fluids can often become irresistible to the point of causing stress and actions that may pose risks to HF patients (Waldréus et al., 2013). Over an 18-month follow-up period, one in five patients with HF feels thirsty (Eng et al., 2021).

In this context, strategies to promote self-management of fluid restriction and thirst are essential for the successful treatment of individuals with HF. Self-management is defined as "an individual's control of their behavior, particularly regarding the pursuit of a specific objective" (American Psychological Association, 2023). For individuals with HF, enhanced self-management has been associated with greater treatment adherence, enhanced quality of life, improved clinical outcomes, decreased hospital readmissions, and lower hospitalization costs (Toback & Clark, 2017).

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Educational videos have been developed to aid adherence to treatment in patients with various chronic diseases (Almeida et al., 2021; Sousa et al., 2021). The dissemination of such materials is facilitated using social media, as it eliminates physical barriers that can hinder access to healthcare resources (Stellefson et al., 2020; Brazilian Network Information Center, 2023; Chen & Wang, 2021).

To the best of our knowledge, there are no specific videos for promoting self-management of fluid restriction and thirst for individuals with HF. Therefore, the objectives of this study were to create and evaluate the content validity of educational videos on self-management of fluid restriction and thirst for individuals with HF.

METHODS

Ethical aspects

The project was submitted to and approved by the Research Ethics Committee for Human Subjects of *Universidade Federal de Sao Paulo* (Protocol 5.554.348/2022), in accordance with the National Health Council/Ministry of Health Resolution 466/12. All participants were guaranteed anonymity and the possibility to withdraw from the study at any point. They were also required to sign the consent form.

Study type

A psychometric study for the development of educational videos and analysis of content validity was conducted in three phases: (1) an integrative literature review to identify strategies for self-management of fluid restriction and thirst; (2) creation of videos on strategies for self-management of fluid restriction and thirst by individuals with HF; and (3) analysis of content validity of the videos.

First phase: identification of strategies for self-management of fluid restriction and thirst

To identify strategies for self-management of fluid restriction and thirst in individuals with HF, an integrative literature review was conducted following Whittemore and Knafl 's (2005) framework, which includes problem identification, literature search, data evaluation, data analysis, and presentation of results.

Problem identification

The problem was operationalized through the research question: What strategies are used to promote self-management of fluid restriction and thirst in individuals with HF?

Literature search

The search strategy was determined according to the PICO acronym: P—patient (individuals with HF); I—intervention (self-management strategies); C—comparison (not applicable); O—outcome (fluid restriction or thirst control).

The search was conducted in PubMed, *Biblioteca Virtual em Saúde* (Virtual Health Library), Cumulative Index of Nursing and Allied Health (CINAHL), and Web of Science. Combinations of controlled terms (Health Sciences Descriptors—DeCS, Medical Subject Headings—MeSH terms, and CINAHL Titles) with non-standardized terms were used. The search strategies for each database are presented in Table S1. No limits were applied regarding the publication year or languages.

Data analysis

The following inclusion criteria were used: observational or experimental studies that mentioned strategies for self-management of fluid restriction and thirst, regardless of their cross-sectional or longitudinal nature. The screening process was performed using the Rayyan manager. Two investigators performed the title and abstract screening independently. Subsequently, the selected articles were read in full by these two investigators.

To search for new studies of interest, the reference lists of included studies were consulted, as well as websites and informational materials from scientific societies: American Heart Association, Heart Failure Association of the European Society of Cardiology, Brazilian Society of Cardiology, Cardiology Societies from different Brazilian states, The American Heart Association, Heart Failure Society of America, and Heart Failure Matters, of the European Society of Cardiology.

The complete reading aimed to extract the following data: study identification (authors, year of publication, level of evidence); objectives; methods (study design; number, diagnosis, gender, age of participants; characteristics of the strategy used to promote self-management of fluid restriction and thirst control); results/conclusions (effectiveness measures of the intervention).

The level of evidence of all included studies was assessed using the Melnyk and Fineout-Overholt Classification: (1) systematic review or meta-analysis of randomized controlled trials, or clinical guidelines derived from systematic reviews of randomized controlled trials; (2) randomized controlled clinical trial; (3) non-randomized clinical trial; (4) cohort and case-control study; (5) systematic review of descriptive and qualitative studies; (6) descriptive or qualitative study; and (7) expert opinion and/or expert committee opinion. Cross-sectional analytical studies were classified at level 4, as they establish relationships between variables and do not merely describe them. Non-systematic literature reviews were classified at level 7 (Melnyk & Fineout-Overholt, 2015). It should be noted that assessment of the level of evidence was conducted for descriptive purposes, and not for exclusion.

Presentation of results

The results were summarized, categorized according to the strategies implemented by professionals or created by patients themselves, and presented in a descriptive manner.

Second phase: creation of videos on strategies for self-management of fluid restriction and thirst by individuals with heart failure

After identifying the strategies for self-management of fluid restriction and thirst in individuals with HF, scripts for the videos were developed, containing the self-management strategies found in the literature review that were considered culturally adequate in Brazil. Subsequently, the videos were animated using the Renderforest app. The scripts and videos were created by a fifth-semester undergraduate nursing student under the supervision of three nursing faculty members, specializing in Cardiology.

The creation of the videos was based on the following principles: (1) short duration and simple language designed to be understandable by children aged 11 and older (Almeida et al., 2021; Sousa et al., 2021); (2) caters to different strata of society, particularly patients with low education levels; and (3) features an expert patient as the main character. An expert patient is defined as "an individual who takes an active/autonomous stance in their health-disease process, based on self-care/self-health/self-disease management, capable of developing and/or enhancing skills necessary to manage their current clinical condition through seeking information about the best treatments many times and being a digital native, assisting others in a similar situation in promoting shared care, becoming a reliable source of support" (Bezerril et al., 2022).

Third phase: content validity assessment by experts

Experts conducted the content assessment of the videos. To be considered an expert, individuals had to meet the following criteria: be a healthcare professional with scientific publications related to HF self-care and a minimum educational level of a master's degree. Potential experts were selected based on a search for the terms "heart failure" and "self-care" in the Brazilian Lattes Platform (https://lattes.cnpq.br/), an information system maintained by the Brazilian federal government to manage information related to individual researchers and institutions in the country. On the Lattes Platform, researchers voluntarily make their academic information publicly available. This includes details about their education, place of work, projects, scientific production, and participation in scientific events and committees, among other information. Access to the Platform is open to the public and does not require any special permissions.

After the selection of potential experts based on their public information, an invitation to participate in the study was emailed. Once the expert agreed to participate in the study, a consent form was sent via Google Forms, along with the videos and the video assessment instrument. Demographic and professional data were additionally requested.

Experts were asked to evaluate the videos against Sousa et al.'s (2021) criteria for the validation of persuasive audiovisual communication: (1) The content is appropriate for the target audience; (2) the language is easily understandable; (3) the colors and shapes of the illustrations are suitable; (4) the arrangement of the figures is in harmony with the text; (5) the illustrations are relevant for understanding the content; (6) the narration is suitable for the content; (7) communication is expressed persuasively; (8) the duration is satisfactory; and (9) the communication can be used as a care technology by healthcare professionals. Criteria were assessed using a four-point Likert scale (from 1 = strongly disagree to 4 = strongly agree), with the possibility to add suggestions, criticisms, and opinions (Ayre & Scally, 2014).

Data analysis

For each Sousa et al.'s (2021) criterion for the assessment of validity of persuasive audiovisual communication, the content validity ratio (CVR) was calculated according to the following formula:

$$\frac{\mathrm{CVR} = \mathrm{ne} - (N/2)}{N/2}$$

where ne is the number of experts who scored 4, and N is the number of experts.

Content Validity Ratio values were considered adequate based on the number of participating experts ($n = 11$), following Ayre and Scally's recommendations (CVR > 0.636) (Ayre & Scally, 2014). The suggestions were assessed by the researchers, and the video items were modified based on their merit and possibility within the video production platform.

RESULTS

First phase: identification of strategies for self-management of fluid restriction and thirst

The selection process of the literature review retrieved a total of 11 studies (Figure 1). In addition, specific strategies for self-management of fluid restriction and thirst were found on the www.heartfailurematters.org website of the European Society of Cardiology.

Characteristics of the studies and the website are presented in Table 1. The studies were published from 2003 to 2021, mainly in the USA ($n = 4$), with a predominance of evidence level 7 evidence ($n = 5$, non-systematic literature reviews or expert opinions).

In addition, the following strategies taught by professionals to support self-management of fluid restriction and thirst were found in the website heartfailurematters.org, of the European Society of

TABLE 1 Characteristics of studies included in the literature review.

Author, country and year of publication	Type of study and level of evidence	Strategies taught by professionals to support fluid restriction and thirst management	Strategies used by the patient to support fluid restriction and thirst management	Information selected to inform video content
Reilly et al. (2015), USA	Randomized clinical trial (pilot) LOE II	Daily record of fluid intake	Not addressed	Video 2: "Try to spread out your allowed amount of fluids throughout the day by writing it down, so you don't get too thirsty all at once." Video 3: "recording the amount of fluids you've consumed […] or color in the glasses on this sheet […] as you consume fluids throughout the day"
van der Wal et al. (2020), Sweden, the Netherlands, and Japan	Cross-sectional analytical LOE IV	Not addressed	Ingest more fluids; use mouthwash; drink tea and lemon juice; consume ice cubes	Video 5: "[…] chew on small ice cubes […]" Video 6: "Drinking some lemonade or gargling with water throughout the day are also things that help with thirst!"
Allida et al. (2018), Australia	Integrative literature review LOE VII	Ingest small sips of water; cold water with a slice of lemon; cold water; chew gum; lozenges, mint candies, artificial saliva	Not addressed	Video 4: "I drink small amounts of fluid several times a day. instead of a full glass of liquid all at once! This really helps with my thirst and keeps my intake under control. You might want to give it a try!" Video 7: "chewing gum, using lozenges or mints, and enjoying frozen fruits" Video 8: "Is your mouth very dry because of the fluid restriction? A good option is to use artificial saliva."
Thapa et al. (2021), India	Cross-sectional, descriptive LOE VI	Not addressed	Drink small quantities of water frequently; drink lemon juice; gargle with water; chew ice cubes; eat cucumbers and drink coconut water	Video 5: "[…] drink small sips of cold water […]" "[…] add lemon to your tea or water, chew small ice cubes […]" Video 6: "Have you ever tried eating cucumber or having cold coconut water? Wow, it's a huge relief!" "Drinking some lemonade or gargling with water throughout the day are also things that help with thirst!"
Allida et al. (2015), Australia	Integrative literature review LOE VII	Ingest cold drinks, ice cubes, peppermint or buttermilk, chew gum	Not addressed	Video 5: "[…] drink small sips of cold water […]" "[…] chew on small ice cubes […]" Video 7: "Chewing gum, using lozenges or mints […]"
Waldréus et al. (2013), Sweden	Systematic literature review of observational studies LOE V	Ingest cold drinks, ice cubes, peppermint and consume less sugar	Not addressed	Video 5: "[…] add lemon to your tea or water, chew on small ice cubes […]" Video 7: "Chewing gum, using lozenges or mints […]"
Allida et al. (2016), Australia	Expert opinion LOE VII	Not addressed	Chew gum and ice cubes	Video 5: "[…] chew on small ice cubes […]" Video 7: " chewing gum, using lozenges or mints, and enjoying frozen fruits."

(Continues)

TABLE 1 (Continued)

Author, country and year of publication	Type of study and level of evidence	Strategies taught by professionals to support fluid restriction and thirst management	Strategies used by the patient to support fluid restriction and thirst management	Information selected to inform video content
Blakely et al. (2017), USA	Nonrandomized clinical trial LOE III	Color water glasses on a page as you drink them to manage fluid restriction	Not addressed	Video 2: "Try to spread out your allowed amount of fluids throughout the day by writing it down, so you don't get too thirsty all at once." Video 3: "recording the amount of fluids you've consumed […] or color in the glasses on this sheet […] as you consume fluids throughout the day"
Boren et al. (2009), USA	Systematic literature review of clinical trials LOE I	Daily weighing and measurement of ankle circumference	Not addressed	Video 9: "one way to know if it is working effectively is to check if your legs are swelling. You can measure your ankle size" Video 10: "One tip to help you control your fluids is to weigh yourself every day at about the same time—always on the same scale and always on an empty stomach. […] If you gain 2 kg in a three-day period, pay attention! You're retaining fluid in your body, and you should contact your doctor."
Radhakrishnan and Jacelon, (2012), USA	Literature review LOE VII	Information about excessive fluid accumulation during weigh-ins can reinforce the need for daily weights, motivating people to manage the daily fluid intake	Not addressed	Video 10: "One tip to help you control your fluids is to weigh yourself every day at roughly the same time—always on the same scale and always on an empty stomach. […] If you gain 2 kg in a three-day period, pay attention! You're retaining fluid, and you should contact your provider."
D'Alto et al. (2003), Italy	Literature review LOE VII	Use of visual materials displaying different characteristics of foods	Not addressed	Material produced by the dietitian available from: https://www.canva.com/design/DAGBN9vtKfw/Qh2GUtfLvZ-dddA6VZP2HQ/edit?utm_content=DAGBN9vtKfw%26utm_campaign=designshare%26utm_medium=link2%26utm_source=sharebutton
European Society of Cardiology, heartfailurematters.org (n.d.)	Expert opinion LOE VII	Tips to reduce fluid intake: use small cups to manage fluid restriction, divide the allowed amount of water throughout the day, drink very cold or very hot liquids Tips for when feeling thirsty: chew ice cubes, limit caffeine and alcoholic beverages, chew gum, eat frozen fruits, and add lemon juice to tea or water	Not addressed	Video 2: "Drinking very cold or very hot liquids can help trick your thirst, since it takes longer to drink them, right." Video 5: "[…] avoid alcoholic beverages like beer and wine, and as well as caffeine in foods like guarana, coffee, and chocolate." "[…] chew on small ice cubes […]" Video 7: "Chewing gum, using lozenges or mints, and enjoying frozen fruits."

Abbreviation: LOE, level of evidence.

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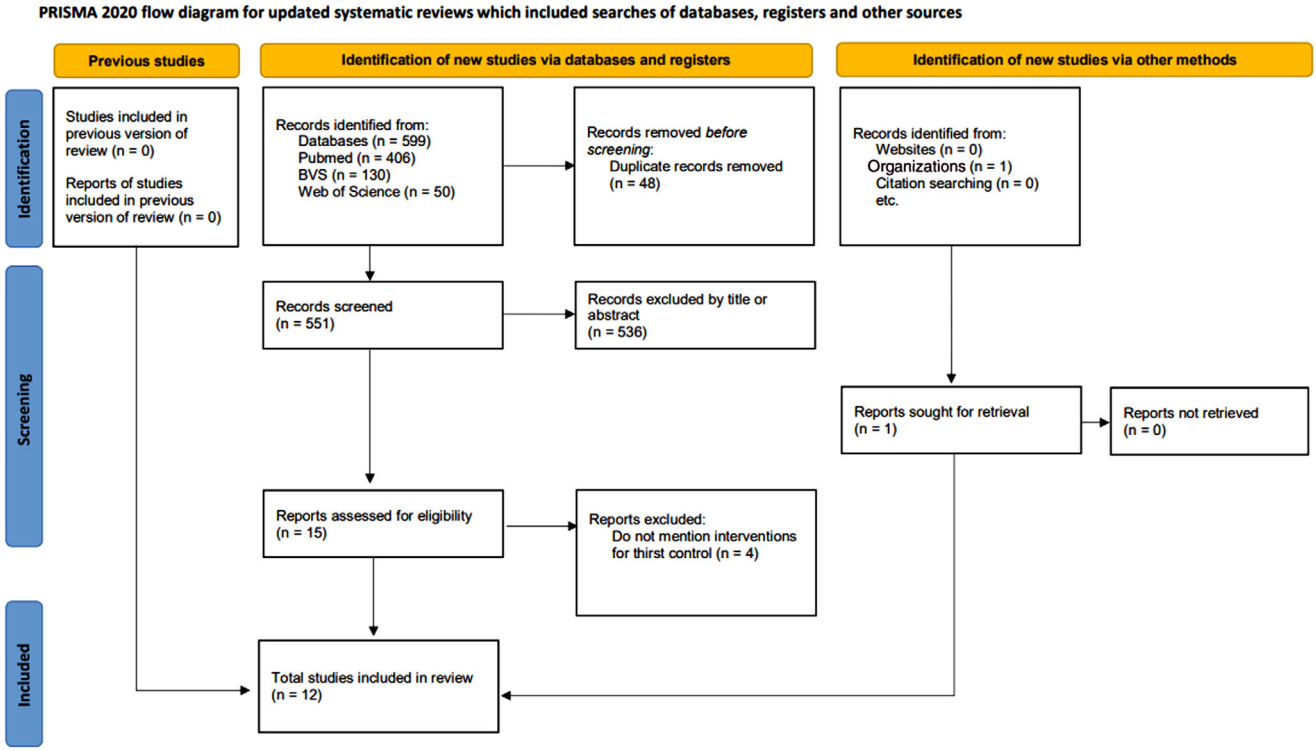

Figure 1 Flowchart for the selection of studies included in the revision, based on PRISMA 2020.

Cardiology, based on expert opinion: "Tips for reducing fluid quantities: use smaller cups to manage and restrict fluids, divide the quantity of water allowed throughout the day, drink really cold or really hot fluids" and "Tips for when you feel thirsty: chew ice cubes, limit caffeinated beverages and alcoholic beverages, chew gum, eat frozen fruit and add lemon juice to tea or water."

The most common strategies for promoting self-management of fluid restriction and thirst included: using visual aids depicting the fluid content in foods, guidance on coloring cups on a page as patient drink water, instructions for self-monitoring fluid accumulation (weighing and measuring ankles), chewing ice chips, chewing gum, sipping cold water in small sips, and gargling with water.

Second phase: creation of videos on strategies for self-management of fluid restriction and thirst for individuals with heart failure

Ten scripts for educational videos were created using the Renderforest webpage, incorporating strategies found in the literature for self-management of fluid restriction and thirst. Table 1 represents the specific videos that included information retrieved from the references.

Because one of the references (D'Alto et al., 2003) used the strategy of visual materials displaying different characteristics of foods, a visual material was created and made available (https://www.canva.com/design/DAGBN9vtKfw/Qh2GUtfLvZ-dddA6VZP2HQ/view) by a dietitian in the research team, containing an exemplary menu for a daily fluid restriction of 1200 mL, along with the water content in common fruits, vegetables, greens, beef, poultry, and eggs, beans, starchy foods, and dairy products. The water content was based on the Brazilian Table of Food Composition (Núcleo de Estudos e Pesquisas em Alimentação da Universidade Estadual de Campinas, 2011), the US Department of Agriculture (2023) and the table for evaluating food consumption in household measurements (Pinheiro et al., 2004).

The characters used were provided by Renderforest, and the videos were produced in vertical format to facilitate viewing on mobile devices, as a significant portion of the Brazilian population has access to smartphones (Brazilian Network Information Center, 2023. The videos have an average duration of 30 s each and include approximately three strategies in their content.

Third phase: content validity assessment by experts

Fifteen experts were invited to participate in the content validity assessment of the videos, and all accepted. However, only 11 assessed the videos within the 15-day deadline. The CVR for each assessment criterion is presented in Table 2, with adequate CVR values in bold.

The experts suggested modifications. The researchers' decisions regarding the suggestions are described in Table 3. It is worth noting that there were no suggestions for any items with a CVR < 0.636.

After the suggestions were provided by the experts, the scripts were modified for the future production of the videos, as presented in Table 4.

TABLE 2 Content validity ratio for each video.

	Content validity ratio for each video									
Item of evaluation/judgment	V1*	V2*	V3*	V4*	V5*	V6*	V7*	V8*	V9*	V10*
1. Content is suitable for the target audience	**0.636**	0.455	**0.636**	**0.818**	0.455	**0.818**	0.455	0.273	**0.636**	0.455
2. Language is easy to understand	**0.636**	−0.091	−0.091	**0.636**	0.273	**0.636**	0.455	0.455	0.455	0.455
3. Colors and types of illustrations are adequate	0.091	−0.273	0.273	0.273	0.273	0.455	0.273	0.273	0.455	0.273
4. Arrangement of the figures is consistent/in harmony with the text	**0.636**	−0.091	0.273	0.455	−0.091	0.455	0.273	0.273	0.455	0.273
5. Illustrations are relevant for understanding the content	0.455	0.273	0.273	0.273	−0.091	0.273	0.273	0.273	0.091	0.273
6. Narration is adequate for the content	**0.636**	0.273	0.273	**0.636**	0.455	**0.636**	0.091	0.273	0.455	0.455
7. Communication is expressed persuasively	0.455	−0.091	0.091	0.455	0.273	**0.636**	0.455	0.273	0.455	0.455
8. Duration time is satisfactory	**0.636**	0.455	0.455	**0.636**	0.455	**0.636**	0.455	0.455	0.455	0.455
9. It can be used as a care technology by health professionals	**0.636**	0.273	0.273	0.455	0.455	**0.818**	0.455	0.273	0.455	0.273

*V1 to V10: video 1 to video 10.

After the modifications, the final videos were made available on YouTube to ensure that individuals with HF, healthcare professionals, and others interested in the topic can have free access to the material created (https://www.youtube.com/playlist?list=PLHynXItQAO-0DbEAmZVKB32kdj-pHFO6K).

DISCUSSION

In this study, educational videos were developed with the purpose of assisting individuals living with HF to self-manage their prescribed fluid restriction and thirst. These videos, made available on digital platforms and easily shareable through social media, feature an engaging and informative approach, ensuring enhanced accessibility and serving as a valuable source of knowledge.

An analysis conducted in 15 countries found that patients have limited adherence to self-management behaviors, and fewer than 50% weigh themselves regularly. This reflects the challenge in managing the disease, further emphasizing the need for readily available information and the motivation, ability, and confidence to execute the behaviors (Jaarsma et al., 2013). Technology has the potential to promote continuous surveillance and management of clinical deterioration in patients with HF. Additionally, it facilitates the provision and dissemination of support for disease self-management to those with chronic conditions (Bezerra Giordan et al., 2022).

The materials produced by the authors underwent a content validity assessment process by experts from different areas, ensuring no bias in the evaluation process due to affiliations. Each suggestion was analyzed and, when feasible within the video creation platform, incorporated to promote acceptance and understanding among the target audience.

The videos are short in duration, allowing for easy sharing via platforms such as WhatsApp and Instagram, as well as other social media, through the sharing of links. This approach is particularly relevant, considering the widespread use of mobile devices and internet access across all age groups in the country. In Brazil, where the number of active mobile phones exceeds 251 million, surpassing the total population (Brasil.2023), this distribution strategy has the potential for significant reach. Furthermore, it is important that evidence-based and credibly endorsed content be made available online, as there is a significant amount of misinformation available on social networks.

As emphasized by Sousa et al. (2021), the narration used in the videos does not rely on technical terminology. Instead, a colloquial language was chosen to promote a more accessible understanding for the general population. The combination of a gentle tone, deliberate speech, and easily understandable language contributes to ensuring that the message is received appropriately and effectively by the audience (Sousa et al., 2021).

The scarcity of studies and online resources addressing self-management strategies for fluid restriction and thirst in people with HF underscores the importance of translating academic knowledge into a language accessible to the general public. The need to value accumulated experiences of patients throughout their journey with HF is recognized, and these experiences are incorporated as essential complements to existing literature. The use of a patient character who provides guidance based on his own experiences contributes

TABLE 3 Summary of suggestions made by the experts about the videos.

Video	Item of evaluation	Suggestions for modifications	Researcher decision
1	Colors and types of illustrations are adequate	Use animated images of edema rather than real-life photos of an individual	Modified as per the suggestion
2	Content is suitable for the target audience	- Include that people can divide fluids throughout the day, and include "vomiting" - Include other health care professionals, not only physicians	Modified as per the suggestion
	Language is easy to understand	- Be clear that fluids are not just water - Make the narration clearer, by saying that in the summer we ingest cooler fluids, and in the winter we ingest hotter fluids	Modified as per the suggestion
	Arrangement of the figures is consistent/in harmony with the text	Reduce the amount of text in the scenes	Modified as per the suggestion
	Narration is adequate for the content	Synchronize words and text	Not modified, due to software limitations
3	Content is appropriate for the target audience	Clarify that the person should drink and mark the number of glasses specified by the physician	Not modified, because the CVR > 0.636
	Illustrations are relevant for understanding the content	Color one of the cups to clarify what is meant by "color the cup"	Modified as per the suggestion
4	Content is appropriate for the target audience	Clarify that the physician is the one who specifies the amount of fluid allowed	Not modified, because the CVR > 0.636
	Illustrations are relevant for understanding the content	Change the word "milk" [*English word*] to "leite" [*Word in Portuguese for "milk"*] or remove	Not modified, due to software limitations
5	Language is easy to understand	Give examples of alcoholic beverages and beverages with caffeine	Modified as per the suggestion
	Arrangement of the figures is consistent/in harmony with the text	Summarize the text	Modified as per the suggestion
	Illustrations are relevant for understanding the content	Add figures with lemon slices and ice cubes	Not modified, due to software limitations
6	Illustrations are relevant for understanding the content	Add figures with lemonade and gargling	Modified as per the suggestion
7	Content is appropriate for the target audience	Suggest that people with diabetes mellitus consult with the team	Modified as per the suggestion
	Colors and types of illustrations are adequate	Replace the images of candies	Modified as per the suggestion
	Narration is adequate for the content	The audio narration failed at the end	Modified as per the suggestion
8	Arrangement of the figures is consistent/in harmony with the text	Include new scenes to make the video more dynamic	Not modified, due to software limitations
	Communication is expressed persuasively	Include where to find the product	Modified as per the suggestion
9	Content is appropriate for the target audience	Clarify that ankle measurement should always be performed at the same location	Modified as per the suggestion
	Illustrations are relevant for understanding the content	Use animated images of ankle measurement	Modified as per the suggestion
10	Content is appropriate for the target audience	Advise to weigh in the morning on an empty stomach	Modified as per the suggestion

to persuasive communication, which has the power to influence and motivate individuals to adhere to a specific goal. Studies have shown that the strategy of presenting an expert patient has been effective in disseminating information, as it brings the viewer closer to the message being conveyed (Bezerril et al., 2022). The character featured is someone who experiences HF and has successfully learned to manage the condition through the strategies conveyed in the videos.

The adoption of digital approaches to education has been steadily growing in the healthcare field. These strategies are employed in

TABLE 4 Video scripts revised based on experts' opinions.

Video	Script
1	Hello! Do you have heart failure and your doctor has told you to limit your fluid intake? It's important to avoid swelling in your legs and that feeling of shortness of breath, right? But is your thirst bothering you a lot? I have the same problem! That's why I've put together several videos with tips I've learned over the years that might help you.
2	Hey, if you have heart failure and need to control your fluid intake throughout the day, I know it's challenging to consume less fluids. Here are some tips that might help: Try to spread out your allowed amount of fluids throughout the day by writing it down, so you don't get too thirsty all at once. Drinking very cold or very hot liquids can help trick your thirst, since it takes longer to drink them, right? And remember that fluids aren't just water; they include all liquids you consume, even those in solid food! Ask your healthcare team how much extra fluid you should consume if it's a very hot day, or if you have diarrhea.
3	For those of you with heart failure who need to manage your fluid intake throughout the day, a simple way to do this is by recording the amount of fluids you've consumed [IMAGE APPEARS, INCLUDING SOUP AND FRUIT] or color in the glasses on this chart [ANOTHER IMAGE APPEARS] as you consume fluids throughout the day!
4	I've been living with heart failure for quite a while now, and I've learned some things to help me consume less fluids and control my thirst. For example, I drink small amounts of fluid several times a day instead of a full glass of liquid all at once! This really helps with my thirst and keeps my intake under control. You might want to give it a try!
5	Hey, if you live with heart failure, do you know that feeling of uncontrollable thirst? Here are some tips to help you manage it: drink small sips of cold water, add lemon to your tea or water, chew on small ice cubes, and avoid alcoholic drinks like beer and wine, as well as caffeine in foods, like guarana, coffee, and chocolate.
6	Hey, if you have heart failure and want to learn how to control your thirst, have you ever tried eating cucumber or having cold coconut water? Wow, it's a huge relief! Even when we want more fluids, we need to resist to avoid worsening our condition! Drinking some lemonade or gargling with water throughout the day are also things that help with thirst!
7	Hey, if you have heart failure and want to learn how to control your thirst, consider chewing gum, using lozenges or mints, and enjoying frozen fruits. Just don't forget: if you have diabetes, you should talk to your healthcare team to help you with this process, and you should aim for sugar-free options.
8	Hey, if you are dealing with heart failure and want to learn how to control your thirst, is your mouth very dry due to fluid restriction? A good option is to use artificial saliva. Have you heard of it? It mimics natural human saliva and is recommended for those who still feel like their mouth is dry, even when consuming fluids. Ask your doctor about it! If approved, you can find it in pharmacies.
9	Hey, if you have heart failure and need to control how much fluid you consume throughout the day, one way to know if it is working effectively is to check if your legs are swelling. You can measure your ankle size using a tape measure, and write down the value every day. Remember to always measure at the height of that little bone on your ankle. Keep this record safe and don't forget to bring it to your next appointment!
10	Hey, if you are managing heart failure and need to control the amount of fluids you consume throughout the day, one tip is to weigh yourself every day at about the same time—always on the same scale and on an empty stomach. It can be your home scale, one at a nearby pharmacy, or a health clinic! If you gain 2 kg in a three-day period, pay attention! You're retaining fluid, and you should contact your provider.

settings such as waiting rooms (McNab & Skapetis, 2019), home visits (Coetzee et al., 2018), and clinics to promote adherence to treatments related to various lifelong diseases. This approach can contribute to the work of healthcare professionals, allowing patients to access information from the comfort of their homes, improving their health outcomes (Deshpande et al., 2023; Monteiro Grilo et al., 2022; Narayanan et al., 2023). Studies should be conducted regarding the effectiveness of using such resources in improving self-management and clinical outcomes (Brasil.2023).

This study has several strengths, including a literature review to support theoretical and empirical knowledge of self-management of fluid restriction and thirst, evaluation by experts from different areas, development of audiovisual resources using simple messages that can reach all strata of society, inclusion of a patient character who could establish a connection through a process of user identification, and creation of persuasive communication. The assessment of content validity provided input to improve the video quality.

Although the primary focus of this study is on individuals with HF, the implications extend beyond this population. Nursing has a crucial role in promoting population health by disseminating evidence-based education and interventions to a broader audience (Melariri et al., 2022). Particularly, nurses have a significant opportunity to guide patients toward credible educational resources and facilitate the adoption of digital health technologies within their communities (Gordon & Crouch, 2019). As self-management support should be a part of routine health care (Toback & Clark, 2017), by leveraging educational tools like these videos, nurses can contribute to promoting healthy behaviors and preventing chronic conditions, not only among individuals with heart disease but also within the general population (Wang et al., 2019).

A limitation of the study is that focus groups and in-depth interviews were not conducted with patients who have firsthand experience with fluid restriction and thirst self-management. Moreover, the videos were mostly based on studies with a low level of evidence. In the future, an evaluation of the videos by users from different regions

and contexts should be performed to determine if they indeed meet their needs, aid, and contribute to promoting self-management of fluid restriction and thirst.

CONCLUSION

The videos were created with strategies that can contribute to fluid restriction and thirst self-management by individuals with HF. The content of the videos underwent additional evaluation by experts in terms of communication, illustrations, narration, duration, and persuasive potential. It is believed that the videos can support health education strategies supporting individuals to use their own skills and knowledge acquired through the videos, adapting them to their life context in dealing with the disease.

Future studies will have these videos evaluated by users from different regions in the country. Testing of effectiveness and efficacy of educational strategies using these videos should be sought.

AUTHOR CONTRIBUTIONS

Sophia Costa Rossetto, Daniele Cristina Bosco Aprile, Vinicius Batista Santos, and Camila Takáo Lopes conceptualized the project and designed the study. Daniele Cristina Bosco Aprile and Camila Takáo Lopes conducted study supervision. Sophia Costa Rossetto, Daniele Cristina Bosco Aprile, and Daiane Lopes Grisante contributed to the manuscript draft. Sophia Costa Rossetto, Daniele Cristina Bosco Aprile, Milena Gomes Vancini, and Daiane Lopes Grisante participated in the acquisition of data. Sophia Costa Rossetto, Daniele Cristina Bosco Aprile, Vinicius Batista Santos, Fabio D'Agostino, and Camila Takáo Lopes conducted the data analysis and interpretation. Daiane Lopes Grisante, T. Heather Herdman, Juliana de Lima Lopes, Vinicius Batista Santos, Fabio D'Agostino, and Camila Takáo Lopes contributed to critical review for important intellectual content. All authors have approved the final version of the manuscript to be published.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

ETHICS STATEMENT

The project was submitted to and approved by the Research Ethics Committee on Human Participants of Universidade Federal de Sao Paulo (Protocol 5.554.348/2022). All participants were guaranteed anonimity and the possibility to withdraw from the study at any point. They were also required to sign the consent form.

ORCID

Sophia Costa Rossetto BSN https://orcid.org/0009-0001-8332-8233
Daniele Cristina Bosco Aprile MSc, PhD(c), BSN https://orcid.org/0000-0002-9169-6052
Daiane Lopes Grisante PhD(c), MSc, BSN https://orcid.org/0000-0002-0200-9987
Milena Gomes Vancini MSc, BSc(Nutr) https://orcid.org/0000-0003-1658-9668
Fabio D'Agostino PhD, RN https://orcid.org/0000-0002-4641-604X
T. Heather Herdman BSN, FNI, FAAN https://orcid.org/0000-0002-6526-1848
Juliana de Lima Lopes PhD, BSN, FNI https://orcid.org/0000-0001-6915-6781
Vinicius Batista Santos PhD, BSN https://orcid.org/0000-0001-5130-5523
Camila Takáo Lopes PhD, BSN, FNI https://orcid.org/0000-0002-6243-6497

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