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# Requirements for building educational and care technology on heart failure

*Requisitos para construção de tecnologia educacional e cuidativa sobre insuficiência cardíaca*

*Requisitos para la construcción de tecnología educacional y cuidadora acerca de la insuficiencia cardíaca*

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## ABSTRACT

**Objectives:** to investigate the requirements for building an educational and care application about heart failure. **Methods:** exploratory study, carried out with 15 people with heart failure and 19 family members/caregivers, assisted in a tertiary unit in the Brazilian Northeast. Individual semi-structured interviews were carried out between November and December 2020. Hannah Arendt's theoretical framework was adopted. **Results:** two units of meaning emerged: "The plurality of care in heart failure" and "Expectations on the construction and use of educational and care technology for heart failure". The requirements involved the need to know the disease and its nuances, as well as the health network, through an application that can minimize individual and social precariousness; and highlighted the importance of the participation of the multidisciplinary team in the development and dissemination of the application. **Conclusions:** requirements on educational and care technology were identified and will support the creation of an application that promotes care, aiming to obtain positive health outcomes.

**Descriptors:** Heart Failure; Mobile Applications; Technology; Educational Technology; Nursing.

## RESUMO

**Objetivos:** averiguar os requisitos para construção de aplicativo educativo e cuidativo sobre insuficiência cardíaca. **Métodos:** estudo exploratório, realizado com 15 pessoas com insuficiência cardíaca e 19 familiares/cuidadores, assistidos em unidade terciária do Nordeste brasileiro. Efetuaram-se entrevistas semiestruturadas individuais entre novembro e dezembro de 2020. Foi adotado referencial teórico de Hannah Arendt. **Resultados:** emergiram duas unidades de sentido: "A pluralidade do cuidado na insuficiência cardíaca" e "Expectativas sobre construção e utilização de tecnologia educativa e cuidativa para a insuficiência cardíaca". Os requisitos envolveram a necessidade de conhecer a doença e suas nuances, bem como a rede de saúde, mediante aplicativo que possa minimizar precariedades individuais e sociais; e destacaram a importância da participação da equipe multidisciplinar no desenvolvimento e divulgação do aplicativo. **Conclusões:** os requisitos sobre a tecnologia educativa e cuidativa foram identificados e subsidiarão a criação de aplicativo promotor do cuidado, visando à obtenção de resultados positivos na saúde.

**Descritores:** Insuficiência Cardíaca; Aplicativos Móveis; Tecnologia; Tecnologia Educacional; Enfermagem.

## RESUMEN

**Objetivos:** averiguar requisitos para construcción de aplicativo educativo y cuidador sobre insuficiencia cardíaca. **Métodos:** estudio exploratorio, realizado con 15 personas con insuficiencia cardíaca y 19 familiares/cuidadores, asistidos en unidad terciaria del Nordeste brasileño. Realizadas entrevistas semiestructuradas individuales entre noviembre y diciembre de 2020. Adoptado referencial teórico de Hannah Arendt. **Resultados:** emergieron dos unidades de sentido: "La pluralidad del cuidado en la insuficiencia cardíaca" y "Expectativas sobre construcción y utilización de tecnología educativa y cuidadora para la insuficiencia cardíaca". Los requisitos involucraron la necesidad de conocer la enfermedad y sus matices, así como la red de salud, mediante aplicativo que pueda minimizar precariedades individuales y sociales; y destacaron la importancia de participación de la equipe multidisciplinaria en el desarrollo y divulgación del aplicativo. **Conclusiones:** los requisitos sobre tecnología educativa y cuidadora fueron identificados y subsidiarán la creación de aplicativo promotor del cuidado, objetivando la obtención de resultados positivos en la salud.

**Descriptores:** Insuficiencia Cardíaca; Aplicaciones Móviles; Tecnología; Tecnología Educacional; Enfermería.

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## INTRODUCTION

The chronic care of the person with heart failure (HF) demands resources and technologies that positively influence the knowledge of the disease, treatment management, prevention of complications with the adoption of healthy behaviors(1-2) and continuity of multidisciplinary care after hospital discharge(3-4). This requires a partnership between patients, families, caregivers, and health professionals, actively involving them in care(5-6).

There is a scarcity of studies that envision the subject with HF in its entirety, that is, that focus on individual and social aspects; and this gap generates ineffective care and non-adherence to therapy(1,5). Caring is an act of concern and dedication, occupation and solicitude(7) and, if associated with education, it helps patients to adequately control their disease and reduce the exacerbation of symptoms(8). Therefore, it demands to assume the illness as a non-solitary experience, with the involvement and participation of family members in the care, also requiring information and ethics. Interpersonal relationships are a fundamental characteristic of the human condition, when individuals live and learn together, even in situations of illness.

The philosopher Hannah Arendt predicts that the human condition is influenced by plurality: with each birth, there is an opportunity for a new beginning and changes, provided by education(9-10). That said, it is argued that, in the context of HF, the human condition refers to birth inserted in heart disease. Thus, the heart is understood as insufficient, a possibility of initiation of the new. In this sense, adopting educational strategies can help subjects to take ownership of this world, in which illness occurs, allowing them to assume responsibility for it in the future.

In order to promote health, several technologies have been developed for people with HF(3). Among them, the use of mobile health, through applications (app), has shown promising benefits in supporting self-care, management and monitoring of the disease(4). Therefore, the importance of including all stakeholders in the care process is reinforced: people with the disease, their family members/caregivers, professionals, managers, and health institutions.

In international studies, the involvement of the person with HF and their family members in the construction of an app is common. However, this participation is still incipient in Brazilian literature, which raises questions about the real needs of these subjects. Given this scenario, the question is: What are the requirements for creating an educational and care technology for people with HF and their families?

## OBJECTIVES

To investigate the requirements for building an educational and caring app about HF Investigate the requirements for building an educational and caring app about HF.

## METHODS

### Ethical aspects

The study was guided by the principles of Resolution 466/2012 of the National Health Council, being carried out after approval by the Research Ethics Committee. For the follow-up of the interviews, the participants gave their consent by signing the Free and Informed Consent Form (ICF).

### Theoretical-methodological framework

The theoretical framework adopted was the works The Human Condition(9) and Between the Past and the Future(10), by Hannah Arendt. In her writings, the philosopher talks about man and specific activities of his human condition, proposing an association between the concepts of education and freedom.

### Study type

Exploratory study, with a qualitative approach, guided by the Consolidated Criteria for Reporting Qualitative Research (COREQ) to verify the scientific quality of the research(11).

### Study scenario

The study was carried out in a tertiary health institution in the Northeast region of Brazil, a national reference in the diagnosis and treatment of heart and lung diseases. The choice for the institution is justified because it has a care complex for people with HF, formed by an outpatient unit - Heart Transplantation and Failure Unit (CICU), an Inpatient Unit and the Cardiac Rehabilitation Unit.

### Data source

Sampling was by convenience, and the representativeness criterion for the end of data collection was the saturation of the discourse. Thirty-four people participated in the study, being 15 patients and 19 family members/caregivers. It is noteworthy that the number of family members/caregivers exceeded the number of patients, as, in some cases, a patient went to the institution with more than one companion. The inclusion criteria were: patients with a medical diagnosis of HF, followed up in at least one of the units of the institution (outpatient, inpatient or rehabilitation). As for family members/caregivers, those aged 18 or over and who participated in home care were included. There was no exclusion, refusal, or withdrawal.

### Data collection and organization

After consent, each of the participants had their interview scheduled, according to their availability, between November and December 2020. They took place in a previously reserved office at the institution; were individual, semi-structured and conducted by four researchers with experience in qualitative research. Initially, an instrument was used to identify the sociodemographic and clinical profile and use of applications. Then, there was a script of open questions, developed based on literature reviews and researchers' knowledge on the topic (Chart 1). For recording, a smartphone with a voice recorder application was used.

The interviews lasted a minimum of 14 minutes and a maximum of 24 minutes, with an average time of 19.4 minutes. Then they were fully transcribed and checked by two researchers.

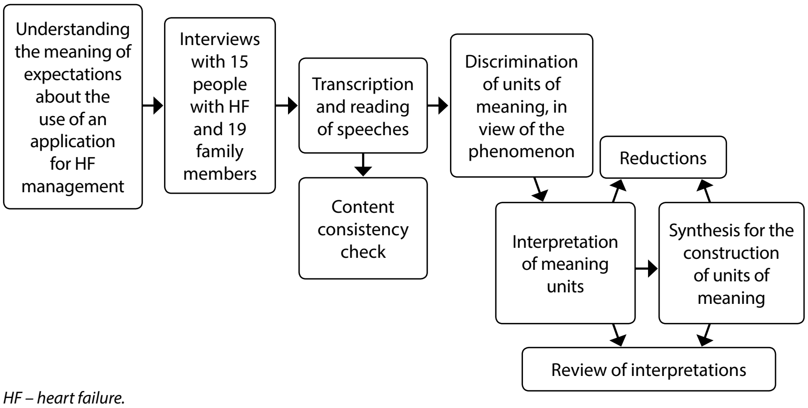
**Chart 1 -** Question script for semi-structured interview

| **Sujeitos** | **Perguntas** |
|---|---|
| Patients | - What information do you usually receive about HF? Which ones would you like to receive?<br>- Do you seek information about HF to learn how to take care of yourself?<br>- What do you think of the idea of receiving this information through a technology, such as an application? How would you like it to be made so that you could use it? |
| Relatives/ Caregivers | - When you accompany your family member with HF to consultations, do you receive guidance from professionals about the disease?<br>- Do you seek information about HF to improve the care of your family member?<br>- Would you use a technology, such as an app, that could help with care? How would you like it to be developed so that you could use it? |

*HF – heart failure.*

### Data analysis

A phenomenological analysis was carried out using systematic reductions in the participants' discourse (Figure 1). Initially, each statement was read and reread separately and then organized into units of meaning. The successive reductions undertaken considered converging and divergent points. Then, the synthesis of the two final units of meaning was made. Both units were reviewed by a third researcher, experienced in qualitative research and systematic reduction.



*HF – heart failure.*
**Figure 1 –** Analysis of speeches

In order to guarantee the validity of this study, the transcribed speeches were verified and approved by each participant to verify consistency. After analyzing the speeches and writing the results, all participants agreed that the findings fully reflected their experiences.

To preserve the anonymity of respondents, the statements were presented using the letter F for "family members" and P for "patients", followed by Arabic numerals corresponding to the order in which the interview was carried out. (F1-F19; P1-P15).

## RESULTS

Table 1 presents the characterization of the research participants. Among the patients, 60% were men, with a mean age of 47.8 (± 13.4) years, and 93.3% lived with relatives; 46.7% had completed high school, 33.3% had a paid job and only 20% received retirement or some benefit; 86.7% had a companion during the consultations, and all reported performing and/or participating in daily care. Regarding clinical data, the disease duration was four years; the mean left ventricular ejection fraction was 45.4% (± 17.2), and three were the number of annual consultations.

Unlike the patients, most family members/caregivers were female; with similar mean age (44.6 ± 14.3 years) and with high school (6; 31.6%); 26.3% of the family members interviewed were spouses or children, who had a paid job; 84.2% accompanied their family to consultations and 89.5% participated in care activities.

Asked about the use of technologies, all patients reported using cell phones making calls, sending, and receiving messages and using the device for social networks and research. The use of general and specific health applications was higher among family members/caregivers.

Initially, we chose to interpret the participants' speeches separately. The narratives of family members/caregivers originated 11 units of meaning; and those of patients, 9 units. Similar meanings were observed between the speeches of the participants.

The unveiling of the phenomenon covered three spheres: knowledge, interpretation and understanding. Each sphere was represented by expressive words present in the speeches. In the sphere of knowledge, the identification of meanings began. Sequentially, the sphere of interpretation brought the units of meaning, which underwent progressive reductions. Finally, we moved towards understanding, an essential step for the confluence of the units and reinforcement of the understanding that no one gets sick alone (Figure 2).

The reductions supported the construction of two units of meaning: The plurality of care in heart failure; and Expectations about the construction and use of educational and care technology for heart failure.

### The plurality of care in heart failure

Participants revealed that HF is a complex disease that requires daily care. This requires essential knowledge, such as general information about the disease, healthy behaviors, treatment options, medications and effects, examinations, and regular follow-up at a health institution.

**Table 1** – Characterization of the participants, Fortaleza, Ceará, Brazil, 2020 (N = 34)

| **Variables** | **Patients (n = 15)** f* | %[†] | **Relatives / Caregivers (n = 19)** f* | %[†] |
|---|---|---|---|---|
| Sociodemographic data | | | | |
| Sex | | | | |
| Female | 06 | 40.0 | 14 | 73.7 |
| Male | 09 | 60.0 | 05 | 26.3 |
| Age (in years) | 47.8 ± 13.4[‡] | | 44.6 ± 14.3[‡] | |
| Kinship | | | | |
| Spouse | - | | 05 | 26.3 |
| Parents | - | | 01 | 5.3 |
| Son | - | | 05 | 26.3 |
| Brother | - | | 02 | 10.5 |
| Nephew | - | | 03 | 15.8 |
| Grandchild | - | | 01 | 5.3 |
| Daughter in law | - | | 01 | 5.3 |
| Unrelated | - | | 01 | 5.3 |
| Residence | | | | |
| Relatives | 14 | 93.3 | - | |
| Friends | 01 | 6.7 | - | |
| Scolarity | | | | |
| Incomplete fundamental | 04 | 26.7 | 01 | 5.3 |
| Complete fundamental | 01 | 6.7 | 03 | 15.8 |
| Incomplete high school | - | - | 01 | 5.3 |
| Complete high school | 07 | 46.7 | 06 | 31.6 |
| Incomplete higher education | 01 | 6.7 | 04 | 21.1 |
| Graduated | 02 | 13.3 | 04 | 21.1 |
| Paid activity (yes) | 05 | 33.3 | 10 | 52.6 |
| Receive retirement | 03 | 20.0 | - | - |
| Receive benefit | 03 | 20.0 | - | - |
| Has a companion/Accompanies appointments (yes) | 13 | 86.7 | 16 | 84.2 |
| Performs/Participates in care (yes) | 15 | 100.0 | 17 | 89.5 |
| Clinical data | | | | |
| Time of illness (in years) | Md[§] = 4.0 | | - | |
| Left ventricular ejection fraction (%) | 45.4 ± 17.2[‡] | | - | |
| Number of consultations (per year) | Md[§] = 3.0 | | - | |
| Cellphone use | | | | |
| Calls (yes) | 15 | 100.0 | 19 | 100.0 |
| Messages (yes) | 15 | 100.0 | 18 | 94.7 |
| Social networks (yes) | 15 | 100.0 | 18 | 94.7 |
| Search (yes) | 15 | 100.0 | 16 | 84.2 |
| General apps (yes) | 11 | 73.3 | 16 | 84.2 |
| Health apps (yes) | 05 | 33.3 | 07 | 36.8 |

**Absolute frequency; †relative frequency; ‡mean ± standard deviation; §median.*

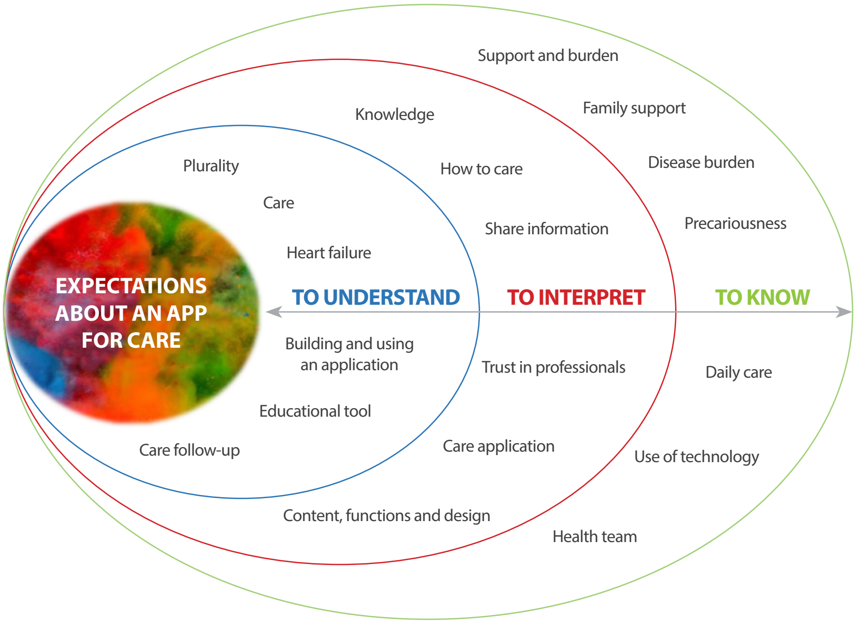


**Figure 2** – Process of understanding, interpretation, and knowledge of discourses for the construction of units of meaning

> *The disease changed everything* […]. *I need to know about medication, physical exertion, symptoms, medication. I can't smoke, I can't drink, I can't eat certain types of food. There are a lot of important information.* (P1)

> *It is a serious disease, with complex treatment and involves light walking, healthy eating and adopting some habits such as measuring blood pressure regularly, sleeping well, resting, avoiding stress, and having regular consultations with various professionals. We need to know everything. it's a new world.* (F2)

Living with HF implies dealing daily with physical, biological, social, psychological, political and spiritual issues, which influence the quality of life and prognosis of the disease, as they can cause hemodynamic instability and frequent hospitalizations. Thus, it is common for patients and family members to express negative feelings, such as incapacity, frustration, fear and insecurity, in addition to the constant feeling of overload.

> *What hurt me the most was when they said I would have to stop working. It was very difficult to see myself in the role of an invalid.* (P9)

> *We deal with a patient at home who needs special care, which we often don't seek. What to do when you get home? It's scary to think that my brother's heart could fail.* [...] *We are very flawed in observing and dealing with the disease on a daily basis.* (F3)

> *Sometimes I feel incapable of taking care of my mother, and it frustrates me a lot.* (F18)

> *The head sometimes gets confused with so much information. it's suffocating.* (P15)

To overcome the complications and limitations of the disease, the participants emphasized the relevance of support networks (family, caregivers, friends, professionals and the health institution itself), expressing the plurality of care for the person with HF.

> *I am watched 24 hours a day by my work friends and my wife. She takes*

> *very good care of me, helps me take the medication, doesn't let me get confused and change the medication. She always makes healthy foods, controls the salt. Without her, it would be hard to get alone.* (P12)
>
> *My son and my wife help me. They research if there is a new treatment if there is anything new about the disease. It's hard, but my family helps me a lot.* (P6)
>
> *At home, we share care, because there are many. Then we exchange the information so everyone knows what's going on.* (F16)

The origin of information about the disease was similar in the participants' speeches. The multidisciplinary health team was cited as the main source. However, there was disagreement regarding the quality of care given by professionals: some participants reported a lack of commitment to comprehensive care, fragmented and only punctual information; while others felt welcomed, well treated and encouraged to learn more about the disease and about self-care, and were even encouraged to participate in scientific events.

> *The information that comes in is very precarious. The little we know, when we don't have direct access, is through the social worker.* (F6)
>
> *I wanted him [doctor] to give me details of the path I have to follow; to open up the conversation a little so that I could express my doubts, as some do not accept to talk.* (P4)
>
> *We are very well monitored here at the hospital. We received all information about the disease, such as care with food, medication.* (P8)
>
> *The doctor explains everything, always very attentive. As we are welcomed and trust the professionals, I don't feel the need to look for information in other sources.* (F17)
>
> *Last year, there was a very important cardiology congress here in the city, and the doctor opened up vacancies for lay people, patients and our families, to attend a lecture on the disease.* (P10)

To overcome the aforementioned fragility, the participants looked for websites and social networks (YouTube videos and blogs) to acquire knowledge and find support groups. However, they confessed concern with the quality and veracity of the content available on the internet and revealed an interest in acquiring technologies, such as apps, that condense reliable information.

> *I like to use my cell phone to research my illness, I read a little about what is happening. It's easier to understand* [the content on the internet] *because many professionals use very technical language. I'm just afraid that the information I find is not true.* (P3)
>
> *I think life is this continuity, always being updated.* (P10)
>
> *I discovered on social media groups of people who have the same disease as me. They always get together. I sent them a message and they invited me to join an online meeting.* (P8)
>
> *I use the cell phone as a strategy to take care of myself.* (P5)

### Expectations about the construction and use of educational and care technology for heart failure

The proposal to develop a technology was quickly directed by them to build an educational and follow-up app to help in their care. Their expectations referred to the improvement of the perception of the disease, availability, convenience, updated, reliable content and the possibility of sharing information with other people.

> *The use of this technology gives hope of caring, understanding and giving my best. A conscious care that makes a difference. Build the app and share. See the inflection point that you can cross and provide care.* (F3)
>
> *The idea of the app is great because it would make me more informed. Any questions, just open and see. We can't always be "running" to the hospital.* (F8)
>
> *The application cannot charge me, because it is very tiring, it disturbs. He doesn't have to walk in front of me, he has to be beside me.* [...] *It has to be useful for me and my family, who live with me.* (F19)

Thus, the app was the technology of choice. Suggestions were given about its content, design, features, and availability. For them, the content of the app should cover cardiac functioning, description of daily care, types of treatment and complications of the disease, arranged in a dynamic, intuitive, and attractive interface, with simple language, colorful images and consistent with the HF theme.

> *The application has to explain the disease, what precautions I should take to keep it from getting worse, better medication, frequency of consultations, regular exams.* (P11)
>
> *The content must be complete: explain everything from how the heart works to when you need a heart transplant.* (P9)
>
> *I wanted [the application] to provide information about my rights.* (P14)
>
> *It would be nice if this app were different, with nice and smooth images and short texts, with simple language.* (F12)
>
> *The application must be attractive, with figures that celebrate life and not illness, with cheerful colors, because life is joy, it is transformation. Information must be clear and objective.* (F3)

As for resources, participants suggested functions for entering personal information (social, clinical, behavioral data, food, daily water intake and well-being), exams, direct contact with the health team, audio resources for recording consultations, changing font size, receiving messages, alarms and reminders for medications and appointments and the possibility of connecting to other gadgets via bluetooth.

> *It would be very interesting to have videos, audios, a messaging resource, a support group, so that people with the disease could communicate, exchange information* [...]. *It could have a function of putting information about our daily lives: how much water did I drink, what I ate, if I did activity, if I felt something.* (P1)

> *It is important to have a function to change font size, color and style, for those people with vision problems and set reminders or alarms for appointments, exams, medications.* (P5)
>
> *You could have the option of sending an email or a message to clear up any doubts, as if the person could seek help from a clinician who is already accompanying them.* (F8)
>
> *I would like the app to be connected to a bracelet or watch that measures heart rate, saturation*. (P15)

Participants recommended that the app be made available on major virtual stores and social networks (Instagram, Facebook, TikTok), in television advertisements and recommended by friends, the developer or other patients. However, they reinforced that health professionals are the most suitable for delivery and presentation, along with the availability of a manual or video guiding how to handle the application. Also, they expressed concern about the costs related to the use of the application.

> *The application can be delivered by a health professional, someone who already knows how to use it and can explain, answer questions. A video can be recorded, or a manual can be built, which teaches how to use it, like a presentation.* (P2)
>
> *The application can be delivered by a health professional, someone who already knows how to use it and can explain, answer questions. A video can be recorded, or a manual can be built, which teaches how to use it, like a presentation.* (F2)
>
> *Everyone needs help looking after themselves and lots of encouragement. The idea* [of the app] *is great, but if it is expensive, few patients will buy it.* (P14)

Participants expressed a lack of knowledge about HF, especially in daily care; and showed concern about the burden of the disease, associated with the amount of information to be learned and followed and the limitations caused. Aiming to contribute to their care, the participants were favorable to the development of the educational and care app; and brought relevant suggestions to encourage its creation and use.

## DISCUSSION

Understanding the expectations of people with HF and their families for the construction and use of an app showed a relationship with Arendtian concepts, which helped in the apprehension of the phenomenon. In the first unit of meaning, concepts such as birth, responsibility, singularity, plurality, freedom, work, fabrication, and action and acting together were addressed. In the second, concepts such as transformation, technology and active life were selected for discussion.

Being born in the condition of heart disease concerns the arrival of people to a world permeated by new habits and obligations, expressing the relationship between those who experience HF and the existing world. For Arendt(9), birth rate is related to the activities performed by man and is especially relevant for action and freedom. From this perspective, the birth condition requires educational action to enable human beings to do something unprecedented. In the case of HF, it seeks to impel people to act and, in this way, encourage the ability to make new choices, to adapt to a new reality and to be ready for changes.

By giving voice to the participants, the impact that HF has on their lives was perceived, which is experienced in a unique way. The reality of the daily life of people with HF and their families is permeated by physical, mental, and social changes, which impose limitations. Therefore, dealing with the disease requires daily modifications and readaptations; and, for that, the subjects must be stimulated to become responsible for their care(12-13).

To think about responsibility is to link it to action, as it involves elements of judgment, thought and will. It is a procedure capable of guaranteeing equality and equity to those who are in situations of vulnerability, including the individual in the community(9). Accountability for care could be seen in the speeches of the participants when they say that they can manage the disease, but, for that, they must know its nuances. Thus, they seek knowledge from health professionals, friends or on the internet and adopt healthy habits, consistent with their health condition.

Education takes care of the new and the inherent uniqueness(10). In HF, it is one of the most relevant elements in disease control, as it promotes the development of care skills, to reduce the likelihood of hospitalization and improve quality of life(14). Furthermore, it is associated with reduced readmission and treatment costs and mortality, as well as increased satisfaction and improved social and clinical outcomes(15).

A mid-range theory for people with HF was developed in a study, in which the following was evidenced: one of the factors that lead to an increase in hospital readmissions among patients with heart failure is poor knowledge about their disease and therapy. From the moment the individual is not invited to participate in the elaboration of their care plan together with the team, they become a passive agent, so that their understanding of the disease is compromised, and in turn, the decision-making process is compromised. decision in the face of an intercurrence is neglected(16). However, these issues can be overcome.

At the same time that HF limits the biological, physical, social and emotional aspects of patients and their families/caregivers, freedom can be found in it, understood as a character of human existence in the world; it is in the possibility of interrupting what is in progress and is shown when people act together or address each other(10). United, people break with ignorance and disinformation, in a condition of freedom to establish a new route.

Interpersonal systems can be seen as feedback loops, as the behavior of each person affects and is affected by the other(17), which reflects a sense of duty of support and respect(18). To exist is to exist in the plural, which means being-in-common and being-with others, being "among" others, who are simultaneously singular and unrepeatable, because only where there is plurality can there be singularity(9). In this sense, HF unfolds in a (intangible) in-between space, in which plurality is shown in words and deeds, speech and action; in which HF patients and their families/caregivers and health professionals reveal themselves as subjects of care.

It is therefore suggested to reflect on these aspects, of the research findings related to the knowledge of people with HF, reveals that vague answers to questions and/or inadequate information regarding heart failure are found among patients who have a weakened relationship with healthcare professionals. health(16).

It is in being-with that the human condition of the person with HF emerges and highlights the singularity in the midst of plurality. For Arendt(9), the three fundamental activities (work, manufacturing and action) are associated with the individual's ability to respond to his/her vital needs, to manufacture a common world as a home and to act among others. In this sense, people with HF must adopt healthy and caring behaviors to ensure survival and create a world that is consistent with their health condition. In this condition of worldliness, they create webs of relationships, expressed by care: parents cared for by children, partners in mutual support in overcoming the difficulties arising from dealing with the unknown, permeated by disabling signs/symptoms.

The chronicity of the disease can lead to loss of autonomy and self-care, producing uncomfortable feelings, such as embarrassment, feeling of uselessness and overload and sadness, both for patients and their families or caregivers(13). Such feelings are aggravated when careless attitudes are observed regarding the relationship with the health team, so often mentioned by the authors. Acting together, praised by Arendt(9), must encompass a reality that should involve the professionals who provide care. In this way, they are encouraged to create and implement social support programs supervised by a multidisciplinary team, remote monitoring, and home visits, which provide both education and support and can improve knowledge and healthy behaviors(19).

The transformation of the reality established for patients with HF and their relatives/caregivers can be achieved through ethical and comprehensive care, with respect and preservation of the freedom of those who become ill(20). Authors claim that patients and their caregivers have a great need to be heard(21). Health professionals should be provided with enabling experiences, so that they can actively recognize themselves in the role of educators for both(7).

Encouraging the transformation of the way of being in the world linked to a reactive decision-making posture in the face of a challenging experience needs to be increasingly understood by health professionals and put into practice within educational interventions based on health needs. In a study on this issue, the need for self-management, palliative care, clinical support care, social support and, especially, the need for dynamic and interactive care centered on the person(22) was highlighted.

Considering the complexity of HF, all investments, technological advances, research, and support therapies to improve daily life and assistance are valid. However, the progressive increase in patients and overload of the health system make room for inclusive technologies, such as apps(23). The growing search for quality care via the app for people with HF demonstrates the relevance of new therapeutic modalities, which favor users, family members and professionals, enhancing positive health results, with greater flexibility.

The vast majority of participants used their cell phones to access social networks, blogs and research sites and were in the habit of using general applications. However, few mentioned the use of health applications. In order to produce something meaningful and transforming, man must maintain a relationship of purpose with the created object, in order to produce something meaningful for himself(10). From this perspective, the construction of the app should aim to reaffirm man as a being of action; enable and encourage him, giving priority to active life.

Participants reported not receiving enough information. Therefore, the search to acquire knowledge on websites and social networks was common. However, they were suspicious of the veracity of the information provided. Thus, they showed interest in using an app with an interactive, personalized interface that had reliable information. Accurate and comprehensive information – such as treatment, adequate response to symptoms, frequency of consultations and recognition of emergencies – must be present in the technology to be developed(24).

Participants were interested in reducing the burden of multiple daily care via functions such as alarms/reminders for medications and consultations/exams, insertion of water intake, food, physical activity, tracking of symptoms and well-being and communication with health professionals. The resources listed can alleviate the burden of HF and positively influence the willingness to take care of oneself without the help of another(24). It also provides a multidirectional informative course, as communicating with the team reduces the anxiety of participants with the disease(25).

The suggestion to make the app available in the most varied media was valid. Social networks positively influence the care of people with chronic diseases, as they flexibly and dynamically articulate numerous participants, encourage community participation in accessing information about disease and treatment, sharing experiences and social support(26). However, the participation of the health team is essential in validating the content and features of the app, as well as indicating its use. The participants even suggested developing a manual to guide how to use the application. In this way, there will be greater freedom in their use.

This process is corroborated in another study, which confirms the need for a careful look at the patient in the context of building a unique education both in the ideation and in the use of technologies, as the patient requests education depending on their needs, preferences, and special abilities. People with HF report, for example, that they need a website where they can research different symptoms and have someone to talk to; they need technology with space for individual opinions or experiences. Still, they need to be informed about how this technology works and its benefits. They also request that the materials be easier to understand, accessible to all audiences and with appropriate layout/text font size due to ophthalmological problems(22).

Based on the results, it is reiterated that the participants were in favor of developing an educational and follow-up application.

### Study limitations

A limitation was that the study was carried out during a pandemic period, which made it difficult to obtain data. Due to the COVID-19 pandemic, some interviews were conducted in non-private locations and had limited time, which may have impacted the participants' speeches.

### Contributions to Nursing and Health

The results presented contribute to the advancement of the area of nursing and health by promoting the construction of a technology that can favor equity and accessibility in care, based on requirements proposed by patients and family members who live with HF.

## FINAL CONSIDERATIONS

Participants revealed that traditional care is effective, but limited in aspects such as information and guidelines for managing HF. Therefore, they seek technologies that allow support for daily care activities and greater communication with the health team. Pondering these expectations in Hannah Arendt's philosophical perspective allowed a greater understanding of the human condition of people with HF and their families/caregivers, in addition to the conception of the technology to be created (application) as a potentially inclusive and liberating tool.

Future research is needed to include the expectations of others involved in the care process, such as the multidisciplinary health team, to make possible the development of educational and care technology endowed with validity, reliability, and usability.

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