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Original Article

Feelings, information and expectations of older adults undergoing cardiac catheterization*

Sentimentos, informações e expectativas de pessoas idosas submetidas ao cateterismo cardíaco

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ABSTRACT
Objective: to understand the main feelings of older adults before cardiac catheterization and the expectations related to the educational process. **Methods:** this is a qualitative study, conducted in the hemodynamics unit of a public university hospital. Semi-structured interviews were applied to 25 older adults undergoing elective procedures, with processing of the textual corpus by *Iramuteq* software using Descending Hierarchical Classification and Correspondence Factor Analysis. **Results:** four classes emerged from the texts: Positive conceptions about cardiac catheterization; Importance of health education; Guidelines on cardiac catheterization; and Perceptions about catheterization. Factors such as waiting time, rescheduling, social support, religious faith and trust in the health team influenced the participants' perceptions. The importance of providing clear information and emotional support to reduce reports of anxiety and improve the patient experience was highlighted. **Conclusion:** although the invasive procedure generates anxiety, clear information, family support, religious faith and continuous support from the health team help to reduce anxieties, minimizing the psychological impact of waiting and the need for rescheduling. **Contributions to practice:** developing educational strategies adapted to the needs of older adults is understood as being fundamental, aiming to promote their well-being, safety and humanized care to offer personalized care.
Descriptors: Aged; Cardiac Catheterization; Emotions; Educational Technology; Qualitative Research.

RESUMO
Objetivo: compreender os principais sentimentos de pessoas idosas antes do cateterismo cardíaco e as expectativas relacionadas ao processo educativo. **Métodos:** estudo qualitativo, conduzido em unidade de hemodinâmica de hospital universitário público. Entrevistas semiestruturadas foram aplicadas a 25 idosos submetidos a procedimentos eletivos, com processamento do *corpus* textual pelo *software Iramuteq*, utilizando Classificação Hierárquica Descendente e Análise Fatorial de Correspondência. **Resultados:** emergiram quatro classes: Concepções positivas sobre o cateterismo cardíaco; Importância da educação em saúde; Orientações sobre o cateterismo cardíaco e Percepções acerca do cateterismo. Fatores como tempo de espera, reagendamentos, apoio social, fé religiosa e confiança na equipe de saúde influenciaram as percepções dos participantes. Destacou-se a relevância de fornecer informações claras e apoio emocional para reduzir relatos de ansiedade e melhorar a experiência dos pacientes. **Conclusão:** embora o procedimento invasivo gere ansiedades, informações claras, suporte familiar, fé religiosa e apoio contínuo da equipe de saúde ajudam a reduzir os anseios, minimizando o impacto psicológico da espera e necessidade de reagendamento. **Contribuições para a prática:** compreende-se como fundamental desenvolver estratégias educativas adaptadas às necessidades da pessoa idosa, visando promover seu bem-estar, segurança e cuidado humanizado para oferecer um cuidado personalizado.
Descritores: Idoso; Cateterismo Cardíaco; Emoções; Tecnologia Educacional; Pesquisa Qualitativa.

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Introduction

Chronic non-communicable diseases represent a significant challenge for global public health due to their high prevalence, long duration and substantial impact on quality of life and the economy[1]. Cardiovascular diseases (CVD) stand out among these as the main cause of mortality worldwide, responsible for almost 18 million deaths in 2022 and representing 33% of total global deaths[2]. Projections indicate that cardiovascular diseases will continue to occupy this position in the coming years[3]. In this context, coronary artery disease (CAD) can be highlighted for its impairment of functional capacity and autonomy, reduced quality of life of older adults, especially considering the aging population and the high financial costs for health services[2-3].

Cardiac catheterization is the most performed interventional hemodynamic technique in the world to diagnose CAD, allowing a detailed assessment of the presence, extent and severity of obstructive coronary lesions[4]. Although well tolerated and with low complication rates, this invasive procedure can cause physiological and psychological changes, such as transient tachycardia and arterial hypertension, anxiety, fear, stress, and depression related to the possible risks involved and the possibility of receiving an unfavorable diagnosis[5-6]. Such reactions can compromise the patient's clinical condition and the exam performance. Important factors which can increase the vulnerability of patients include first-time experience with the procedure, low education level, limited access to health services, and the waiting time for the exam[5-6].

Nurses play an essential role in the context of hemodynamic practice, from scheduling to post-procedure interventions. In the pre-procedure phase, they are responsible for providing clear information appropriate to the patient's education level, investigating the patient's perceptions and expectations, and creating an environment of trust and acceptance. Nurses significantly contribute to reducing uncertainty, distress, and anxiety, as well as promote the patient's emotional well-being by using empathetic communication strategies, active listening, and psychological support[6-7]. Thus, their role goes beyond technical issues, also encompassing psychological and emotional care, strengthening the patient's trust in the health team and in the procedure performance.

Publications conducted with the general public are found when reviewing the state of the art which describe the feelings, emotions, and anxieties of patients undergoing the cardiac catheterization exam. Previous research focuses on the use of non-pharmacological strategies to manage anxiety symptoms, whether physical and/or psychological[6,8-9]. However, no investigations have been found to date which have specifically addressed the older adult population, which justifies new research.

The results of this study will support development of an educational strategy which helps reduce anxiety levels, promoting greater understanding and adherence to the guidelines provided, not only aiming to improve the quality of care in the hemodynamics laboratory, but also to promote the well-being of patients, thereby ensuring qualified and holistic care[6,8-9]. Thus, we propose to investigate: "What are the main feelings of older adults related to cardiac catheterization before the procedure and their arising expectations from the educational process?"

Therefore, this study aimed to understand the main feelings of older adults before cardiac catheterization and the expectations related to the educational process.

Methods

This is a qualitative study based on the Consolidated Criteria for Reporting Qualitative Research (COREQ) criteria. The study was conducted in the hemodynamics and interventional radiology unit of a public university hospital in João Pessoa, PB, Brazil.

The population of interest included older adults with cardiac conditions to be clarified and who

were treated at the aforementioned unit for elective cardiac catheterization. This situation refers to a previously scheduled procedure, in which scheduling at this institution occurs directly in the department responsible for performing it. At this time, the patient holds a request for the exam, and then receives verbal and written instructions (folder) on the appropriate preparation for the procedure by the unit's nurse.

The inclusion criteria for this study were: age 60 years or older, with no restriction on maximum age; both sexes; and with preserved cognitive conditions. Individuals who had previously undergone catheterization were excluded; hemodynamically unstable (who presented decreased level of consciousness; typical precordial pain; decompensated arterial hypo/hypertension; dyspnea; signs of shock and/or pulmonary congestion); or using benzodiazepines and/or anxiolytics. There were no refusals or withdrawals from participation in the study.

The sample was non-probabilistic by convenience, based on the accessibility and availability of participants to the researcher[10]. A total of 62 people were approached on the days of the exams, but 37 did not meet the inclusion criteria. There were no refusals among those invited, resulting in the inclusion of 25 participants, according to the theoretical data saturation method. This was discussed by the authors of this study and understood as the moment when the participants' responses became repetitive, indicating that new information does not emerge for qualitative analysis[11].

The data were collected between January and April 2024 through semi-structured interviews, developed by the researchers. The interviews were applied at the time of the patient's admission to the aforementioned unit and conducted by three researchers. The professionals have clinical and research experience in nursing care for patients with cardiac problems. They were previously trained, made a brief personal presentation and explained the research objective.

The cognitive capacity of the participants was assessed by the following questions: "What is your full name?, How old are you?, What day is it today?, Where are we right now?" Eligible participants continued with the data collection, which included the following sociodemographic information: gender, age, education level (years of formal study), religion and marital status. The guiding questions about the object of study consisted of: "How long have you been waiting for the exam?, Has this procedure been rescheduled previously?, How do you feel today about having to undergo cardiac catheterization?, Do you believe that this feeling is related to which reason or factor?, and Do you have any questions?".

After the initial questions were asked, educational information about cardiac catheterization was provided through a standard folder available in the unit, and then three more questions were asked: "How do you feel after receiving this information?, Did the information improve your expectations regarding the exam or not? and What information provided this?".

The interviews were conducted individually in a private location, in the presence of a companion if the participant wished, and lasted an average of 20 minutes. The audio content was recorded with a smartphone digital recorder and supplemented with field notes. The interview recordings and the information from the field notes were transcribed in full by one of the researchers. There was no need for interruption or repetition. At the end, any remaining questions from the participants were clarified. After being transcribed, the interviews were not returned to the participants for comments.

Sociodemographic data were analyzed using descriptive statistics (absolute and relative frequencies). The participants' responses were organized into a textual corpus and processed by the *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (*Iramuteq*, version 0.7 alpha 2) software as support for data processing.

The interview data analysis was conducted using the lexicometric approach aiming to detect patterns, trends and discursive styles in a set of texts[11-12]. The Descending Hierarchical Classification (DHC) was

used, which is described in four stages: (1) Automatic reading and preparation of the textual corpus, with distinction between active and supplementary forms; (2) Construction of contingency matrices, followed by the Descending Hierarchical Classification until new stable classes are not formed; (3) Generation of lexical profiles of each class, presentation of the detailed results of the chi-squared tests and performance of a Correspondence Factor Analysis (CFA) of the classes; (4) Performance of complementary calculations and identification of the most representative text segments (TS) of each grouping[11].

This textual analysis of the data seeks to identify TS classes which share similar vocabularies among themselves, while distinguishing themselves from the vocabularies present in the TS of other classes. Furthermore, the relationships between the classes are visually demonstrated by a dendrogram[11]. The CFA was subsequently performed from the DHC, which maps the words associated with each class on a Cartesian plane, graphically representing the connections and oppositions between the words and the classes, being another way of visualizing the relationships between the classes[11]. This enables examining the different contents represented. After the lexical analysis, the results were compared with the existing scientific literature.

The analyses considered the following criteria: minimum use of 75% of the text segments in the lexicographic approach, Chi-squared (X^2) value greater than 3.84 and statistical significance of $p<0.0001$, indicating satisfactory separation between the classes[11]. In addition, the factor sum of the axes of the CFA graphs was close to 100%[12].

The CHD classes were named and interpreted according to the results presented in the dendrogram, which was read from left to right, as recommended[13]. The CFA interpretation was conducted in terms of opposition between the X and Y axes, enabling analysis of the associations and distances between the classes and the words associated with each of them[11-12].

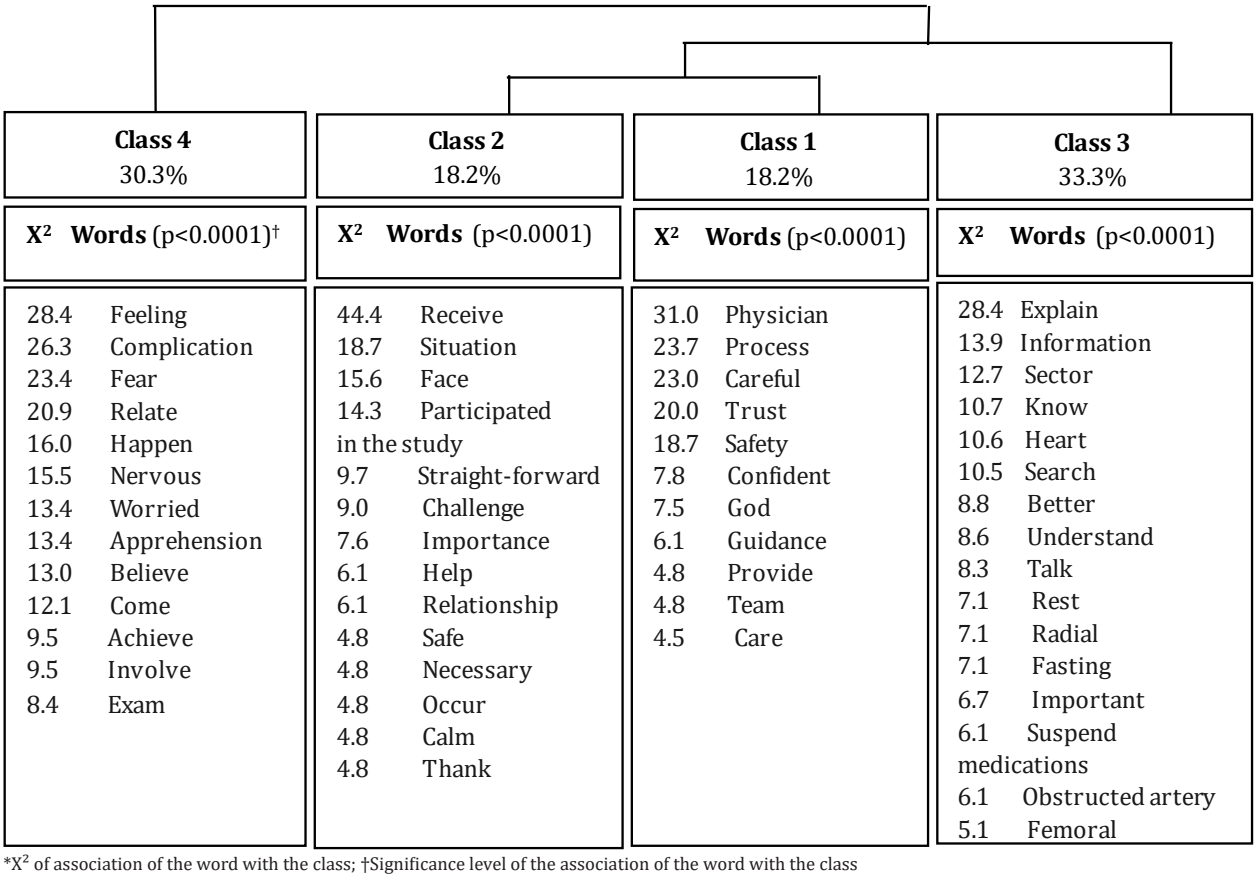
All participants were informed about the study objectives, the voluntary nature of participation, anonymity, and the freedom to withdraw at any time. Participation was formalized by signing the Informed Consent Form, with the guarantee that the decision to participate or not in the study would not affect the care provided at the unit.

The participants were numbered from 01 to 25 and identified with the code name "Id" in order to guarantee anonymity. The study was approved by the Research Ethics Committee of the Federal University of Paraíba, under opinion number 6,497,735/2023 and Certificate of Presentation for Ethical Appreciation 74950723.3.0000.5183, following the ethical requirements of Resolution No. 466/12 of the National Health Council.

Results

A total of 25 older adults aged between 60 and 80 years were included. The average age of women was 70.0 years (±6.8), while men, who were slightly younger, had an average age of 66.6 years (±5.0). Other predominant sociodemographic characteristics were: male gender (56%); educational level between high school and incomplete higher education (36%); marital status married or in a stable union (80%); and Catholic religion (80%). Regarding operational information, the waiting time between scheduling and performing the exam was less than 1 month for 64% of participants, and 80% did not have the exam rescheduled.

Corpus processing performed by the *Iramuteq* software based on the 25 texts from the interviews identified a total of 4,228 occurrences of words. The corpus was divided into 118 text segments, of which 99 (83.9%) were considered statistically valid and analyzed using CHD, resulting in four distinct classes, which then originated the dendrogram (Figure 1). The classes were subdivided into three branches: the first generated class 4; the second, class 3; and the third originated classes 2 and 1.



*X^2 of association of the word with the class; †Significance level of the association of the word with the class

Figure 1 – Dendrogram referring to the distribution of words in each class according to the Descending Hierarchical Classification. João Pessoa, PB, Brazil, 2024

Class 4, called Perceptions about catheterization, involved 30.3% of the retained elementary context units (ECUs), was predominantly composed of male participants, aged 60 to 69 years, with education ranging from complete elementary school to incomplete high school, who waited more than a month for the procedure to be performed, and did not have the exam rescheduled. A variety of feelings, emotions and concerns regarding the exam can be evidenced from the statements listed below: *I feel nervous. I've met people who went to get tested and died* (ID 01, female, 73 years old). *I feel nervous, in fact, everything is bad, I was desperate, I started crying because it took so long to get the test. I felt like anyone else. Unknown things always cause apprehension, my chest tightens* (ID 07, female, 60 years old). *I feel worried. Many people I knew came to tell me some information about the test and the person thinks about it with fear. I believe that this feeling is related to what complications might happen during the test* (ID 05, male, 79 years old). *I feel worried, nervous because I don't understand anything about the test. I've had more and more edema in the last few days, I've been coming from another institution that didn't solve my problem, they don't tell me what I have, so this increases my apprehension, because it's about my health* (ID 20, male, 60 years old).

The emotional state of participants is impacted by fears and uncertainties regarding the unknown, apprehension about the results and the possibility of needing additional treatment. The delay in scheduling the exam and the need to reschedule due to clinical decompensation increase the emotional burden, generating an environment of constant anxiety. Additionally, reports of previous experiences from family members and acquaintances about complications during the exam contribute to this anxiety, affecting the health and well-being of participants.

Class 2, entitled Importance of health education, comprised 18.2% of the retained ECUs, and mainly included male participants, aged between 60 and 69 years, and educational levels ranging from complete high school to incomplete higher education. The speeches that follow demonstrate these opinions: *Although I still feel anxious, I am grateful to have more information about the exam and to have participated in the study. I am better prepared to face the challenges that lie ahead, confident that I am taking the necessary steps to take care of my health in the best possible way* (Id 20, male, 60 years old). *This clarity that you gave me about what to expect gives me hope that everything will go well. Receiving this information and clarification was very good in easing my fears. And I remember that I had already seen a video on the internet about this exam* (Id 21, female, 62 years old). *I really enjoyed participating in the study, it gave me a boost of spirits due to the idea that technologies have evolved, reducing the chances of complications. I am grateful for all the information I received, as it helped to clarify many doubts and gave me a clearer view of the exam* (Id 22, male, 62 years old).

It is evident that the educational process prior to cardiac catheterization plays a significant role in the reports of anxiety relief and increased confidence of some participants. Access to clear information and knowledge acquired about the exam and the evolution of the technologies involved through guidance and participation in the study are valued and contributed to better emotional preparation and reduced fears and insecurities.

Next, Class 1 – Positive conceptions about cardiac catheterization (represented by 18.2% of the total ECUs), was balanced among participants of both sexes, with the age group of 60 and 69 years predominating, and education ranging from complete high school to incomplete higher education. Below are some excerpts that portray the conceptions: *In short, I trust the team, I'm well informed about the exam and I maintain my hope and faith in a positive result. I thank everyone for their support and guidance throughout this process* (Id 15, male, 69 years old). *I feel normal, very calm, confident in God's protection, in the support of my daughter (nurse), in the competence of my known doctor and I know that everything will work out* (Id 17, female, 64 years old). *I was very grateful when the lady arrived and began to explain everything in detail, offering clear guidance and clarifying any doubts I might have had. Her care helped to increase my confidence in the procedure* (Id 25, female, 60 years old).

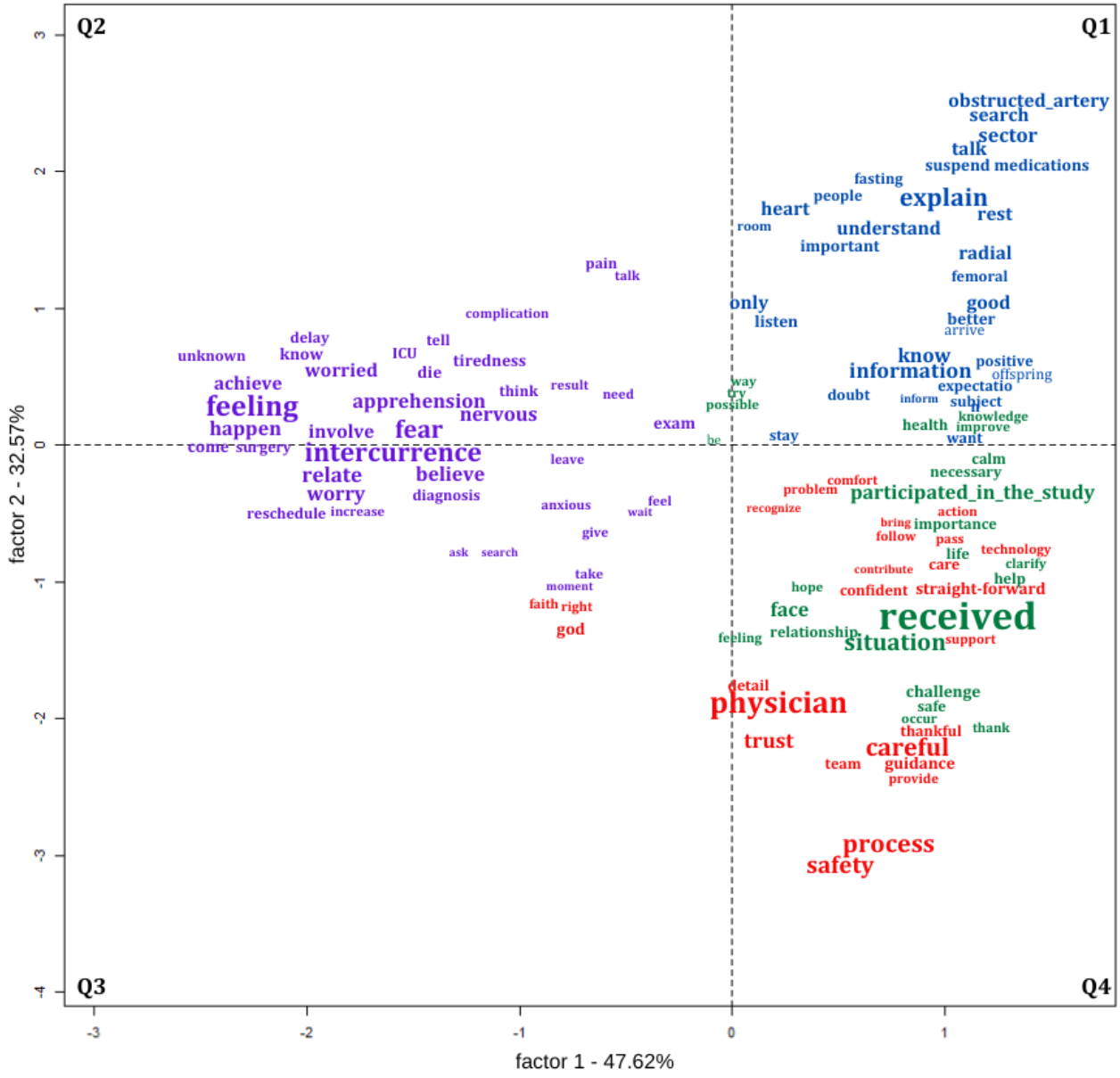
Many participants face challenges in dealing with their concerns faced with the need for the exam, while others are more confident in the competence, care and support of the healthcare team. Religious faith stands out as an important source of comfort and hope, helping to deal with the uncertainty and fear associated with the procedure. In addition, aspects such as the support of family members in the healthcare field and the positive influence of a familiar doctor provide comfort, support and peace of mind to some participants during the process.

Class 3, Guidelines on catheterization, is the largest of the classes, encompassing 33.3% of the ECUs, and was mainly composed of male participants; aged between 60 and 69 years; and with an education level ranging from complete elementary school to incomplete high school. It is possible to observe selected excerpts to exemplify these representations below: *I know that rest is especially important, so as not to overdo it and have bleeding* (ID 01, female, 73 years old). *I only knew about fasting and stopping medication, and you told me all the information about how the exam will be. Being healthy is the most important thing in life* (ID 12, female, 74 years old). *I want the exam to be done through the arm (radial) because I live on the 1st floor, so for the sake of convenience for me and the effort that I can't do with my leg, I would prefer to avoid any discomfort* (ID 15, male, 69 years old). *It gives me comfort to be able to talk and have all my questions answered by someone who understands and works in the field. Now, I better understand that the exam wants to see if there is a blocked artery in the heart* (ID 21, female, 62 years old).

Participants recognize the importance of following appropriate instructions, highlighting rest, fasting, and discontinuation of medications to avoid complications during and/or after the procedure. Some express a preference for the radial route for performing the exam due to greater comfort, convenience, and shorter recovery time. Finally, there is recognition of the importance of preserving health.

Next, the *Iramuteq* software performed the cor-

respondence factor analysis based on the classes that emerged from the descending hierarchical classification, which are presented through the factor representation in Figure 2. The most representative words of each class are graphically highlighted in the image, enabling visualization of the interconnections between the classes, as well as the size of the words, which reflects their representativeness in each class. In addition, the analysis enables understanding the context in which the words were associated with statistical significance. The two main factors together explain 80.19% of the variability, being distributed between the X (47.62%) and Y (32.57%) axes of the Cartesian plane.



Note: Class 1 – red (Q4); Class 2 – green (Q2); Class 3 – blue (Q1); Class 4 – purple (between Q2 and Q3). Factor 1: X axis and factor 2: Y axis
Legend: Q1, Q2, Q3 and Q4 represent the quadrants

Figure 2 – Graphical representation of the correspondence factor analysis of the most frequent active words in each of the lexical classes obtained in the descending hierarchical classification of the contributions of the 25 older adults. João Pessoa, PB, Brazil, 2024

There is a clear separation on the X axis (factor 1, horizontal) between class 4, located on the negative side, and classes 1, 2 and 3 on the right side (positive). Classes 3 and 4 on the Y axis (factor 2, vertical) are positioned on the positive side, but in different quadrants, while classes 1 and 2 mainly occupy the negative side of the Y axis. This two-dimensional configuration reveals four lexical worlds, reflecting dynamics of distancing and rapprochement in the discourses, as illustrated by the dendrogram (Figure 1).

Class 3 stands out in the upper right quadrant (Q1) with words such as "explain", "information" and "sector", evidencing the search for clarity and understanding about the procedure. Quadrants Q2 and Q3 are associated with class 4, in which the words "feeling", "complication" and "fear" reflect emotional concerns and fears regarding the exam. Class 1, in the lower right quadrant (Q4), presents terms such as "doctor", "care" and "safety", which suggest trust in the health team, while class 2, with words such as "receive", "situation" and "face", emphasizes the need for emotional support given the experience of vulnerability.

Finally, considering the interdependence of the classes, class 4 stands out as more isolated and independent, reflecting a contrasting theme in relation to the others. In turn, classes 1 and 2 present strong interdependence and intertwining, indicating proximity in the discourses. Although class 3 is close to the horizontal line, it is located in different quadrants from classes 1 and 2, suggesting a low dependence between them and a more limited (but still present) bond.

Discussion

There was a predominance of males in this study, which is in line with research available in the literature, and argues that men have a higher risk of cardiovascular events due to factors such as greater exposure to risk behaviors, including smoking, inadequate diet and lower adherence to preventive care. In addition, men tend to seek less medical care, which worsens the prognosis when the disease manifests itself[2,14]. However, the sudden drop in estrogen levels in the post-menopausal period is associated with an increased cardiovascular risk for women, since it promotes metabolic changes, such as increased insulin resistance and lipid disorders, making them more vulnerable to heart disease[3,15].

The data regarding marital status indicate that most participants were in a stable union, reflecting a cultural pattern that values family formation, especially in more traditional segments[16]. The presence of a partner or family caregiver can positively influence the patient's health, providing emotional and practical support during treatment, as well as promoting greater healthcare to cope with chronic diseases and invasive procedures[14].

The findings of Class 4 corroborate previous studies indicating that the emotional vulnerability of older adult patients is exacerbated by factors such as lack of information and fear of the unknown, especially in relation to invasive procedures[5,16]. Low education level is particularly associated with a lower ability to understand and process health information, which can generate greater anxiety and insecurity regarding the procedure, in addition to hindering adherence to coping and self-care strategies[5,17-18]. There was a significant relationship between patients' anxiety levels and their educational and socioeconomic levels[14].

The waiting time for cardiac catheterization varied significantly among patients in this study. Prolonged waiting can profoundly affect patients' emotional state, generating feelings of helplessness and hopelessness, making the process even more stressful. Evidence indicates that long waiting times for medical procedures are often associated with increased emotional distress, negatively impacting both patients' mental health and well-being[5,18]. The constant uncertainty and worry during this period can raise cortisol levels, a hormone associated with stress. When present at high levels, cortisol can harm mental health, exacerbating psychological distress and negatively affecting patients' physical health, including conditions such as metabolic syndrome and increased vulnerability to infections[19].

The need to reschedule due to clinical decom-

pensation observed in 20% of the sample contributes to increased stress among both patients and their families. This factor not only generates frustration and discouragement, but also prolongs the period of uncertainty and apprehension regarding the procedure, since patients may associate rescheduling with the progression of an undiagnosed disease or the possibility of serious complications and even death. The results of the study corroborate findings in another study that reinforces the importance of clear communication and management of patients' expectations when faced with the need to reschedule medical procedures in order to reduce the emotional impact and promote a more sensitive, informed and welcoming care environment[20].

A previous study demonstrated a positive impact on reducing patients' anxiety resulting from physical and psychosocial support by providing monitoring and intervention during the waiting period between scheduling and performing the procedure[21]. This study provided comprehensive care to patients, managing them from the waiting list and implementing an intervention focused on emotional support, providing a feeling of security and continuous support. Thus, it highlights the need for a more sensitive and welcoming approach on the part of the health team, which should seek to minimize rescheduling and the emotional impacts of these unforeseen events.

Class 2, which explores the importance of health education, highlights the need for detailed information and emotional preparation. The literature suggests that pre-procedure education can significantly reduce patient anxiety[7,22]. However, some of the participants still verbalize anxiety symptoms, indicating the need for more personalized and continuous approaches to emotional support.

Educational interventions related to catheterization are frequently used by nurses before, during, and after the procedure, with the purpose of providing technical information on patient preparation, in addition to clarifying doubts. The guidance provided by this professional reduces patient insecurity and enables greater clarification about the future event. The educational activity reveals positive results in the quality and safety of care and in effective communication between staff and patient[22-23]. Therefore, planning, development, validation, and application of educational material appropriate to the needs of the population and that seeks to promote health should be encouraged.

Positive conceptions about the examination, addressed in Class 1, reflect trust in the health team and the positive influence of factors such as family support and religious faith. Previous studies indicate that the relationship of trust between patient and team, combined with social support, are crucial to promote a safer and more welcoming environment and for the psychological well-being of patients[9,22,24].

Religious affiliation plays an important role, especially in the Brazilian context, where religiosity is a predominant characteristic of the population and the majority of the population is catholic[25]. Religious faith was cited by all participants, with 80% identifying themselves as Catholic, and not only strengthens the social support system, but also serves as a coping strategy in facing imminent identification of risks related to the procedure[26-27]. It is evident that including religious and spiritual dimensions in the care of patients with heart disease is related to higher recovery rates, better adherence to treatments, and an increase in the quality of life of these patients. Thus, integrating these spiritual factors into patient care can substantially improve the care experience, promoting a holistic approach that is more sensitive to the emotional and psychological needs of heart disease patients[28].

Class 3 addresses the guidelines on the procedure, emphasizing the importance of adherence to instructions. However, it is still possible to identify erroneous or incomplete interpretations about the exam. In addition, limited knowledge is reinforced by beliefs and previous experiences of acquaintances or family members. These results corroborate studies whose objectives were to identify people's knowledge and feelings about catheterization, and showed that

most users are unaware of the purpose of the exam or have inadequate and limited knowledge, which may be associated with the emergence of negative feelings[7,29].

Satisfactory knowledge, adequate preparation and adherence to instructions are essential to ensure a safe, effective and complication-free procedure, as well as a faster recovery. Furthermore, a well-informed patient can be freed from negative feelings caused by lack of knowledge. Finally, it is interesting to pay attention to reliable and reputable information sources, giving preference to guidance provided by health professionals[29].

By focusing on education programs, psychological support, relaxation interventions and clear communication, health professionals not only promote the mental and emotional well-being of patients, but also have the potential to improve clinical outcomes, increase adherence to guidelines and increase overall satisfaction with care[6,8-9,18]. This contributes to creating a more welcoming, positive environment that is conducive to quality care.

It is essential that educational strategies and technologies for older adults consider the cognitive and educational level, as well as contextual factors, such as socioeconomic and cultural levels. Using simple language combined with appropriate resources is essential to facilitate understanding, also taking into account possible sensory and cognitive limitations, such as hearing loss, memory difficulties or limitations in accessing information[30]. These factors can directly impact content absorption, and should therefore be considered when developing strategies.

Finally, factorial representation in the context of Descending Hierarchical Classification is an interesting tool for analyzing qualitative data, but it is still little explored in the scientific literature. Its ability to graphically reveal associations, dependencies and interrelations between terms enables deeper understanding of textual data. In a scenario of increasing volume of qualitative data, this graphic resource contributes to data visualization and a more dynamic interpretation of the discourses and experiences reported by participants.

Study limitations

Limitations of the study include being conducted in a single location and the lack of validation of interview transcripts by participants.

Contributions to practice

This study contributes to the field of gerontological nursing by highlighting the need to provide clear, detailed and personalized information, considering the individual characteristics of each patient, such as their level of understanding. The results found will provide support for developing a short-term audiovisual technology adapted to the needs of the older adult population with the aim of promoting better health indicators.

Conclusion

The results show that although the experience of an invasive procedure is marked by anxieties and fears related to the unknown and possible complications, providing clear information adapted to the understanding level of patients, family support, religious faith and ongoing support from the health team play important roles in reporting a reduction in these anxieties. Waiting for the procedure and the need to reschedule also affect the emotional experiences of older adults, and it is essential that these aspects are understood and supported appropriately in order to minimize the psychological impact.

The study reinforces the importance of educational strategies to offer more humanized care, with a focus on improving the patient experience and advancing the care process. Adopting patient-centered approaches which consider their expectations and concerns can represent a significant advance in clinical practice, resulting in more humanized and effective care in the context of invasive procedures such as cardiac catheterization.

Authors' contributions

Conception and design or analysis and interpretation of data; Writing of the manuscript or relevant critical review of intellectual content; Final approval of the version to be published; Responsibility for all aspects of the text in ensuring the accuracy and integrity of any part of the manuscript: Nepomuceno AMT, Mélo CB, Sousa MM, Moreira MASP. Writing of the manuscript or relevant critical review of intellectual content; Final approval of the version to be published; Responsibility for all aspects of the text in ensuring the accuracy and integrity of any part of the manuscript: Silva SPC, Marques MCMP.

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