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KNOWLEDGE AND FEELINGS OF PEOPLE BEFORE CARDIAC CATHETERIZATION PROCEDURE

*Conhecimento e sentimentos de pessoas pré-procedimento de cateterismo cardíaco**Conocimientos y sentimientos de las personas antes del procedimiento de cateterismo cardíaco***Wallison Pereira dos Santos¹** **Bianka Nóbrega Fernandes²** **Mailson Marques de Sousa³** **Glaydes Nely Sousa da Silva⁴** **Valdicleia da Silva Ferreira Torres⁵** **Camila Abrantes Cordeiro de Moraes⁶** 

ABSTRACT

Objective: to identify people's knowledge and feelings about cardiac catheterization. **Method:** descriptive study, qualitative approach, carried out with 12 patients in a cardiology reference hospital, in the city of João Pessoa, from November to December 2021. Data were collected through recorded and semi-structured interviews, the data analyzed by Analysis of Bardin content. **Results:** three thematic categories were constructed from the interviews: C1 - Knowledge of the cardiac catheterization procedure, C2 - Lack of guidance on care involving cardiac catheterization and C3 - Feelings regarding cardiac catheterization. The data highlights insufficient and limited knowledge that may be related to the emergence of negative feelings. **Final considerations:** There is a perceived need for guidance and information, as well as the planning and construction of educational technologies for people who will undergo cardiac catheterization, with the purpose of promoting a safe pre, intra and post-exam.

DESCRIPTORS: Cardiac catheterization; Knowledge management; Cardiovascular nursing;

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RESUMO

Objetivo: identificar o conhecimento e sentimentos de pessoas sobre o cateterismo cardíaco. **Método:** estudo descritivo, abordagem qualitativa, realizado com 12 pacientes em hospital referência em cardiologia, no município de João Pessoa, no período de novembro a dezembro de 2021. Os dados foram coletados através de entrevista gravada e semiestruturada, os dados analisados pela Análise de Conteúdo de Bardin. **Resultados:** a partir das entrevistas foram construídas três categorias temáticas: C1 - Conhecimento do procedimento de cateterismo cardíaco, C2 - Falta de orientação dos cuidados que envolvem o cateterismo cardíaco e C3 - Sentimentos à realização do cateterismo cardíaco. Os dados evidenciam um conhecimento insuficiente e limitado que podem se relacionar com o surgimento de sentimentos negativos. **Considerações finais:** Percebe-se a necessidade de orientações e informações, bem como o planejamento e construção de tecnologias educativas para as pessoas que irão realizar o cateterismo cardíaco, com a finalidade de promover um pré, intra e pós-exame seguro.

DESCRITORES: Cateterismo cardíaco; Gestão do conhecimento; Enfermagem cardiovascular;

RESUMEN

Objetivos: identificar los conocimientos y sentimientos de las personas sobre el cateterismo cardíaco. **Método:** estudio descriptivo, de enfoque cualitativo, realizado con 12 pacientes en un hospital de referencia en cardiología, en la ciudad de João Pessoa, de noviembre a diciembre de 2021. Los datos fueron recolectados a través de entrevistas grabadas y semiestructuradas, los datos analizados por Análisis de Bardin contenido. **Resultados:** a partir de las entrevistas se construyeron tres categorías temáticas: C1 - Conocimiento sobre el procedimiento de cateterismo cardíaco, C2 - Falta de orientación sobre los cuidados relacionados con el cateterismo cardíaco y C3 - Sentimientos respecto al cateterismo cardíaco. Los datos destacan conocimientos insuficientes y limitados que pueden estar relacionados con la aparición de sentimientos negativos. **Consideraciones finales:** Se percibe la necesidad de orientación e información, así como la planificación y construcción de tecnologías educativas para las personas que serán sometidas a cateterismo cardíaco, con el propósito de promover un pre, intra y post examen seguro.

DESCRIPTORES: Cateterismo cardíaco; Conocimiento administrativo; Enfermería cardiovascular.

INTRODUCTION

Cardiovascular diseases (CVD) are notable for their high morbidity and mortality rates, accounting for 41 million deaths annually on the global stage. In the national context, CVD accompanies this incidence, constituting the main cause of death, hospitalizations, outpatient care and costly financial expenses for the public health system.¹

It is possible to identify a strong association between longevity and CVD, but the scenario seems to be changing as we see an increase in cases among young adults, an important change in the epidemiological profile that will have devastating repercussions on the quality of life of those affected by CVD.²

There has been growing progress in the clinical treatment of cardiovascular diseases, with the introduction of pharmacological and non-pharmacological therapeutic targets and diagnostic resources using minimally invasive techniques, such as coronary angiography, popularly known as cardiac catheterization. It is a diagnostic test, considered the gold standard for identifying obstructive lesions and visualizing the heart chambers, and consists of the introduction of catheters by percutaneous puncture and contrast infusion.³

In this sense, some precautions are fundamental for pre- and post-cardiac catheterization preparation, which requires the person to be aware of their own health condition and especially of the examination to be carried out, with a view

to preventing complications related to the procedure and post-catheterization recovery.⁴

The literature describes that performing the cardiac catheterization procedure in the complex environment of the hemodynamics unit can predispose people to negative feelings such as anguish, fear and anxiety. Furthermore, the lack of adequate information and preparation can expose them to unnecessary risks related to pre- and post-examination management and care, leading to adverse events such as pseudoaneurysms, infections, hematomas, ecchymoses, peritoneal hemorrhages and even contrast-induced nephropathy.⁵

The study is justified by the need to understand and highlight the knowledge of people who will undergo cardiac catheterization, in view of experiences during the residency process in cardiovascular care that signaled possible limitation of information, since several times the exams were rescheduled due to the physical and/or emotional unpreparedness of the person, either in the pre- or intra-exam period, some post-exam complications were also identified due to lack of information that culminated in harmful outcomes.

This investigation was based on the following research question: What is the knowledge of patients about the cardiac catheterization procedure? With a view to understanding people's knowledge and fostering dynamic and interactive educational strategies, the aim was to identify people's knowledge and feelings about cardiac catheterization.

METHOD

This was a qualitative study, following the recommendations of the Consolidated Criteria for Reporting Qualitative Research (COREQ). It was carried out in the medical clinic of a teaching hospital which is a reference in cardiology and interventional care in the capital of the state of Paraíba. At this institution, cardiology care is provided by appointment, via the Unified Health System and also privately, characterizing it as a mixed dynamic.

The study included people aged 18 or over; inpatients with a medical request for their first cardiac catheterization exam; who had no visible and/or self-reported difficulties/limitations.

Twenty people were approached the day before the exam, however, eight participants did not fit the established criteria and of those invited to take part, there were no refusals. In this study, the sample was taken using the data saturation method, i.e. until the answers were too repetitive and did not contribute to new understandings and reflections.

The data was collected by means of an interview recorded with a digital smartphone recorder and guided by a semi-structured script, developed by the researcher, in a private place on the premises of the medical clinic. Initially, sociodemographic and clinical categorization was carried out, with the following variables: age, gender, marital status, family income, family arrangement, race, schooling, indication for the procedure, rescheduling of the exam, risk behaviors, medications in use and presence of comorbidities.

As for the interview script, the questions were organized in a fixed order and with the questions remaining the same for all the participants in the survey: Have you ever heard of cardiac catheterization? Do you know how it is performed? Were you instructed on care before and after the procedure? How did you feel when you found out you were going to have to undergo cardiac catheterization? Tell me about your experience.

The interviews were recorded and later transcribed, keeping the regional terms used, slang and neologies, and there was no processing of the speech. The average length of the interviews was 15 minutes. At the end of each one, the researcher explained how the cardiac catheterization procedure takes place and the main precautions before and after the procedure, clarifying doubts and resolving taboos expressed by the participants. In order to guarantee anonymity, the participants were numbered from 1 to 12 and given the code name "P".

It should be noted that the interview was conducted by one of the researchers, who has 2 years of clinical and care experience in cardiovascular care, as well as a postgraduate degree in cardiology and hemodynamics.

The data was analyzed using the Content Analysis method developed in three phases: pre-analysis; exploration of the material; and data treatment. In the pre-analysis phase,

initial ideas were organized; after organizing the content and reading the data, the material was explored by transcribing the data and choosing generic categories to represent the central idea. Finally, the data was processed using a critical and reflective analysis.⁶

Respecting ethical precepts, the study was approved by the Research Ethics Committee of Faculdade Nova Esperança (FACENE), with a favorable opinion of No. 5,127,617. Eligible individuals were informed about the research and included in the study after accepting and signing the Informed Consent Form.

RESULTS

The participants were 12 people who were about to undergo cardiac catheterization for the first time. With regard to the characterization of the participants, six (50%) were male and six (50%) female, with an average age of 70 years, ranging from 57 to 92 years, the predominant marital status was widowed with 42%.

Seven (59%) had an income of less than the minimum wage (R\$1,192.40); eight (67%) lived with family members; six (50%) had only attended elementary school and with regard to color, there was a similarity where four (33%) considered themselves white, four (33%) brown and four (33%) black.

In terms of comorbidities, there was a predominance of Systemic Arterial Hypertension (SAH) and Diabetes Mellitus (DM), 84% and 34% respectively. Among the risk behaviors, eight (67%) reported smoking, seven (59%) didn't do any physical activity, six (50%) drank alcohol and five (42%) ate a high-fat diet. The most common medical diagnoses for cardiac catheterization were unstable angina and acute myocardial infarction with ST segment elevation (33% each). With regard to drug therapy, nine (75%) used dual antiplatelet therapy with acetylsalicylic acid and Clopidogrel. It should be noted that the majority of participants, seven (59%), said they would reschedule the procedure.

Three thematic categories emerged from the groupings: C1- Knowledge of the cardiac catheterization procedure; C2- Lack of guidance on the care involved in cardiac catheterization and C3- Feelings when cardiac catheterization is performed.

C1- Knowledge of the cardiac catheterization procedure.

This category refers to understanding the cardiac catheterization procedure and how it is performed. It is possible to identify that the study participants have incipient, inadequate and incomplete knowledge. Most of the participants associated cardiac catheterization as a procedure related to clearing the coronary arteries, often being confused with angioplasty (which has a therapeutic purpose). In addition, limited knowledge is fostered by the beliefs and experiences of other people who have already undergone the procedure, as noted below:

No, no. I've heard it's like this... it depends, it can be through the arm, which is a wire, I don't know, and it can be through here (femoral), which is precisely to destroy the vein that's clogged. That's the only thing I know... put a little clamp on it so the blood can pass through. (P4)

Not me. I see the movement of the others here. (P10)

I don't know. All I know is that when a doctor told me that my heart had two clogged veins. Then I asked a little woman who had already done it, she said that sometimes it's done in the arm, she said it doesn't hurt much, sometimes she said it's done in the groin, then an anesthetic is put in, a little tool is put in and it goes in the vein that's clogged, if you do it in the morning then it's gone by the afternoon. (P7)

No. According to the doctor, there's a clot that clogs the vein and the catheterization is to unclog that vein, in his words. (P9)

C2- Lack of guidance on the care involved in cardiac catheterization.

This category shows the predominance of participants who said they had not received any information/guidance on pre- and post-examination care. The minority of interviewees who said they had received guidance on the procedure said that this information corresponded to general and empirical care, which did not address the specific care of cardiac catheterization, according to the statements made:

No, no, I really wanted to know what I should do... It would be better if they informed us, wouldn't it? Because they tell us to do it and they don't say anything, I just see people going back and forth. (P11)

No, they didn't tell me anything, but you can tell me, can't you? (P5)

No, I wasn't. I like to be honest, no one told me anything. I like to be honest, nobody guided me... because I wasn't guided at all. It would have been much better if someone had come to guide me, but nobody came to tell me anything, what is that? (P6)

Guided. He said I had to rest a lot. Then he told me to rest, take a shower and take the bandage off my leg, not just dry it off, it has to be wet. (P1)

Not so far. All I know is that I shouldn't do anything extravagant, right? When the appointment was made, they said I was going to be hungry all day, I wasn't going to eat anything, but it didn't work out and then they canceled it. (P10)

C3- Feelings after cardiac catheterization.

In relation to the feelings and the way in which the participants received the information about the need for cardiac catheterization, it is possible to see that the majority felt some

negative emotional impact, however, others were hopeful that it was the only way out of their health problem.

I went into despair, I went into despair, I cried, I got so nervous that I needed a head doctor, and I'm going crazy after being old? I didn't even like people talking about catheterization, or doctors, or going back to the doctor, I was like, terribly scared, I was traumatized. (P1)

I was nervous and scared, as anyone is, right? If I didn't, it would have been better. (P2) I was scared. I was very nervous... (P3)

I wasn't prepared, I felt like crying (crying), I'm anxious about the delay, anxiety is terrible, it gets on anyone's nerves. (P6)

I felt relieved, because it's going to solve my heart problem. (P11)

I felt happy, because it's going to improve my situation, but I felt a bit scared, because it's going to mess with my heart, I put God first. (P5).

DISCUSSION

Based on the analysis of the interviews, it is possible to identify that the study participants have little knowledge about the cardiac catheterization procedure; however, it seems to be a compilation of disjointed information, predominantly based on the beliefs and experiences of other patients who have already undergone the test. In addition, there is a lack of pre- and post-exam educational guidance, which is based solely on the need to fast before the exam. Care before the procedure and especially after cardiac catheterization is of fundamental importance for safety during the procedure and to mitigate possible complications.

It should be noted that guidance on the procedure to be carried out is a patient's right and should be given in a clear and concise manner, in order to provide the person with adequate, truthful information based on science, and thus avoid unnecessary exposure that could lead to complications that are often avoidable. It's important to remember that when the patient is admitted for the test, they sign a form agreeing to all the procedures involved, so there seem to be flaws in communication and in the purpose of the form, since generally the professional responsible for ensuring that the form is signed is the nurse, a professional who wasn't even mentioned in terms of providing guidance.

Lack of information predisposes patients to negative feelings related to the procedure, such as fear, anxiety and nervousness, which will have a direct impact on physiological and emotional responses and may even prevent cardiac catheterization from taking place.⁷

The results found corroborate a study carried out in Maranhão, whose objective was to describe the knowledge and meaning of cardiac catheterization for patients with heart

disease, which points out that knowledge is limited, since patients are submitted to the procedure without knowing what it is about, which leads to confusion between the different procedures of cardiac catheterization and angioplasty, that is, the purpose of the former as being an investigation and the latter as therapeutic.⁸

A study carried out in the interior of São Paulo found that patients had little or no knowledge of interventional procedures (cardiac catheterization and angioplasty). Participants sought to expand their knowledge by consulting the internet via smartphones, so it is important to be cautious when acquiring information from virtual sources, it is interesting to pay attention to reliable and renowned sources, giving preference to guidance from health professionals.⁹

It is imperative to highlight the potential of adequate and dynamic guidance that fosters the understanding of the exam by the person who will undergo cardiac catheterization, considering that they will be an active agent during the entire procedure, since lack of knowledge can affect the performance of the exam and bring harmful complications, so nurses are one of the professionals in charge of the educational process, that is, the dissemination of adequate information.¹⁰

Nurses can be considered to be the professionals closest to the patient and, for this reason, qualified to provide appropriate guidance, clarify doubts about possible harmful events, taking into account the appropriateness of the content and the way of explaining it to the patient's educational, cultural and social level, with a view to avoiding limitations in the information and erroneous inductions about the procedure.¹¹

Because it is a highly complex service, the practice of health education can be perceived as something punctual and not a continuous process, observing the absence of the role of nurses in this aspect.¹² It is essential to note that the situation of the covid-19 pandemic seems to have hindered the process of health education due to the restrictions and limitations imposed on the world scenario, according to a study in which challenges and barriers to guaranteeing health education in the face of the pandemic were evidenced.¹³ Therefore, dispersing information alone does not guarantee patient understanding and awareness. It is necessary to plan, adapt educational material and evaluate health education based on interactivity, dynamism and potential for understanding.

International research carried out in Peru, with the aim of determining the effectiveness of a nursing educational intervention on cardiac catheterization in terms of information and prevention of complications, points out that it was vital for the participants to conduct an educational intervention using images and dialogue in order to understand the examination to be carried out, in the prevention of complications and also in the acquisition of didactic skills related to the nurse facilitators of this service.¹⁴

It is important to emphasize that the educational process has as one of its pillars the emancipation of the person, responsibility for the health situation and also the patient's contribution to the care offered, and this should not be dif-

ferent for the person who will undergo the cardiac catheterization examination, and it is necessary to demystify certain preconceptions and clarify symbolisms related to the heart and the procedure itself.¹⁵

Adequate knowledge and precise guidelines with a view to liberating health education that gives the patient the possibility of autonomy over their current health situation is of fundamental importance to ensure a safe, effective and complication-free procedure, adding that a patient equipped with knowledge can also be freed from negative feelings caused by ignorance.¹⁶

In addition to the person's educational and biological situation, it is important to reflect and consider the social, emotional and cultural context, given that the heart is considered an organ with symbolic significance, responsible for emotions and the center of life. Thus, any procedure carried out on the heart often represents a situation that involves negative emotional impact, conflicts and anxieties, as this procedure can be understood by the individual as a threat and, at the same time, a salvation, favoring increased levels of anxiety and fear in this population.¹⁷

It should be noted that cardiac catheterization can represent a borderline situation for those who are going to undergo it, since on the one hand there is the disease/injury that needs to be corrected because it poses a risk to the continuity of life, and on the other hand there is the lack of knowledge about the procedure.¹⁸ It is important to emphasize that there is a predominance of elderly people being targeted for cardiac catheterization, and it is worth inferring that this population may have other chronic diseases in progress, as well as the possibility of a higher frequency of low levels of education, making it difficult to properly understand the health-disease process and its interfaces.⁹

Misinformation and ignorance are potential sources of anxiety, especially when this information is provided in an unsatisfactory manner, and it is possible to observe transient and somatic manifestations in the patient, such as sweating, tachycardia, altered sleep patterns, increased blood pressure, hyperventilation, among others. The lack of information can be considered distressing and is aggravated by the increase in waiting time, especially when it exceeds the scheduled date, as is the case in this study, in which most of the participants have already experienced rescheduling of the procedure.¹⁷

The study is promising for clinical nursing practice, as it shows and signals the knowledge of people who will undergo cardiac catheterization, thus attesting to and presenting gaps related to guidance and receiving information, thus allowing professionals to act in a problem-focused way, in order to implement educational technologies that favor the construction of their knowledge and autonomy.

In this way, we are reflecting on the central role of nursing care for patients undergoing pre-examination for cardiac catheterization, in order to foster educational strategies that strengthen patient autonomy, as well as sensitizing them to self-care. It is suggested that intervention studies using edu-

cational technologies be carried out, with a view to ensuring comprehensive care that is applicable in a wide variety of settings where cardiac patients will be present.

The limitations of this investigation may be related to the method used to select the sample, such as the use of saturation and the low number of participants, which do not allow the findings to be generalized, and this information should be interpreted with caution.

FINAL CONSIDERATIONS

From the above, it is possible to identify that people in pre-procedure situations for cardiac catheterization have limited knowledge about the exam, with conceptual confusion and confusion about its purposes. The knowledge exposed by the study participants is formulated by the experiences of other patients who have already undergone cardiac catheterization. It can be seen that the guidance given is primarily focused on technical and general situations, with no specific information being provided on pre- and post-cardiac catheterization care.

The lack of information and/or inadequate guidance not only places the person in situations of physical risk, but also brings psychological suffering, which has a strong impact on conducting a quality examination. It can be seen that the health professionals involved in cardiac care provide fragmented information and guidance on care, highlighting the need for nursing to play a leading role in educating and guiding the dissemination of knowledge, thus relieving the tensions, fears and anxiety that permeate cardiac catheterization.

REFERENCES

1. Malta DC, Bernal RTI, Vieira Neto E, Curci KA, Pasinato MTM, Llisboa RM, Cachapuz RF, Coelho KSC, Santos FP, Freitas MIF. Doenças Crônicas Não Transmissíveis e fatores de risco e proteção em adultos com ou sem plano de saúde. *Rev Ciência & Saúde Coletiva*. [Internet]. 2020 [acesso em 20 de novembro de 2021];25(8). Disponível em: <https://doi.org/10.1590/1413-81232020258.32762018>
2. Massa KHC, Duarte YAO, Chiavegatto Filho ADP. Análise da prevalência de doenças cardiovasculares e fatores associados em idosos, 2000-2010. *Rev. Ciênc. Saúde colet*. [Internet]. 2019 [acesso em 20 de novembro de 2021];24(1). Disponível em: <https://doi.org/10.1590/1413-81232018241.02072017>
3. Teixeira TRF, Avila MAG, Braga EM. Compreensão de pacientes às orientações de enfermagem no cateterismo cardíaco: uma pesquisa qualitativa. *Rev Cogitare Enferm*. [Internet]. 2019 [acesso em 18 de novembro de 2021];24(1). Disponível em: <http://dx.doi.org/10.5380/ce.v24i0.56604>
4. Queiroz VMB, Nunes JSS, Aragão GGA. Assistência de Enfermagem no Procedimento de Retirada do Introdutor Pós-cateterismo e Angioplastia Coronária: Uma revisão integrativa. *Rev Multidisciplinar e de psicologia*. [Internet]. 2021 [acesso em 19 de novembro de 2021];14(54). Disponível em: <http://idonline.emnuvens.com.br/id>
5. Helaehil LV, Palmeri GA, Magalhães NS, Milagres CS. Prevenção da Nefropatia induzida por contraste em pacientes submetidos a procedimentos em cardiologia intervencionista e hemodinâmica. *Rev Saúde em Revista*. [Internet]. 2019 [acesso em 20 de novembro de 2021];19(51). Disponível em: <http://dx.doi.org/10.15600/2238-1244/sr.v19n51p77-86>
6. Bardin L. Análise de conteúdo. Portugal: Edições 70; 2011.
7. Silva VF, Lohmann PM, Pissaia LF, Costa AEK. Cateterismo cardíaco: a entrevista frente aos anseios do paciente. *Rev Research, Society and development*. [Internet]. 2018 [acesso em 14 de novembro de 2021];7(12). Disponível em: <https://doi.org/10.33448/rsd-v7i12.500>
8. Castro YTBO, Rolim ILTP, Silva ACO, Silva LDC. Conhecimento e significado do cateterismo cardíaco para pacientes cardiopatas. *Rev Rene*. [Internet]. 2016 [acesso em 20 de novembro de 2021];17(1). Disponível em: <http://periodicos.ufc.br/rene/article/view/2602/1991>
9. Bertolini SRF, Santos SVM, Silva LA, Robazzi MLCC. Avaliação do conhecimento dos pacientes submetidos ao cateterismo cardíaco e angioplastia coronária: uma contribuição para atuação da enfermagem. *Rev Expressão Católica*. [Internet]. 2019 [acesso em 13 de novembro de 2021];4(2). Disponível em: <http://dx.doi.org/10.25191/recs.v4i2.3220>
10. Santesso ACOA, Fridricha DBC. Desinformação do usuário e oportunidade para a enfermagem. *Rev Reuol*. [Internet]. 2017 [acesso em 13 de novembro de 2021];24(1). Disponível em: <http://dx.doi.org/10.5380/ce.v24i0.56604>

- 2021];11(10). Disponível em: <https://pesquisa.bvsalud.org/portal/resource/pt/bde-33047>
11. Silva DML, Carreiro FA, Mello R. Tecnologias educacionais na assistência de enfermagem em educação em saúde: revisão integrativa. *Rev. Enferm UFPE on line*. [Internet]. 2017 [acesso em 20 de novembro de 2021];11(2). Disponível em: <https://doi.org/10.5205/1981-8963-v11i2a13475p1044-1051-2017>
 12. Santana VM, Gomes TN, Maranhão TSPA, Silva SP, Vieira VBC, Ribeiro RM, Silva JP. Health Educations for patients in the perioperative period of cardiovascular surgery: experience report. *Rev. Brazilian journal of health review*. [Internet]. 2021 [acesso em 12 de novembro de 2021];4(2). Disponível em: <https://doi.org/10.34119/bjhrv4n2-124>
 13. Palácio MAV, Takenami I. Em tempos de pandemia pela COVID-19: o desafio para a educação em saúde. *Rev Vigilância Sanitária em debate*. [Internet]. 2020 [acesso em 14 de novembro de 2021];8(2). Disponível em: <https://doi.org/10.22239/2317-269X.01530>
 14. Minguillo M, Beatriz M, Pretel R, Giovana, S. Eficácia de uma intervenção educativa de enfermagem sobre cateterismo cardíaco no nível de conhecimento e na prevenção de complicações em pacientes de um hospital de Lima. *Rev Alicia*. [Internet]. 2018 [acesso em 12 de novembro de 2021];1(18). Disponível em: https://alicia.concytec.gob.pe/vufind/Record/RPCH_ebedef9ced3cffe8161d88ba01dec00b
 15. Almeida MS, Melo RHV, Vilar RLA, Silva AB, Melo ML, Medeiros Junior A. A educação popular em saúde com grupos de idosos diabéticos na estratégia saúde da família: uma pesquisa-ação. *Rev Ciência Plural*. [Internet]. 2019 [acesso em 12 de novembro de 2021];5(2). Disponível em: <https://doi.org/10.21680/2446-7286.2019v5n2ID16954>
 16. Oliveira ADSC, Mader BJ. Emoções e sentimentos desenvolvidos nos procedimentos e nas intervenções em cardiopatas: uma revisão integrativa. *Rev Pluralidades em Saúde Mental*. [Internet]. 2020 [acesso em 12 de novembro de 2021];9(2). Disponível em: <http://dx.doi.org/10.17648/2447-1798-revistapsicofae-v9n2-5>
 17. Castro LV, Dias B, Assis CN, Reis CS, Donadoni G, Oliveira LI, Bambino RF, Toledo JDK. O impacto emocional da cirurgia cardíaca. *Rev Científica FAGOC*. [Internet]. 2019 [acesso em 18 de novembro de 2021];4(1). Disponível em: <https://revista.fagoc.br/index.php/multidisciplinar/article/view/496>
 18. Martins LM, Kazitani BS, Bolela F, Maier SRO, Dessotte CAM. Sintomas de ansiedade, depressão e ansiedade cardíaca pré-operatório segundo o tipo de cirurgia cardíaca. *Rev Reme*. [Internet]. 2021 [acesso em 12 de novembro de 2021];25(esp). Disponível em: <https://doi.org/10.5935/1415.2762.20210002>.