

Original Article

The modifications, the reasons and the meanings of the occupations after the heart surgery

Das modificações, os porquês e os significados das ocupações após a cirurgia cardíaca

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Abstract

Occupations are actions carried out during life, which have form, purpose, and meaning. Having undergone cardiac surgery as well as the post-operative process can influence the engagement of these occupations. To investigate this issue, the study sought to understand how the occupations of people in the postoperative period of cardiac surgery are presented. This is qualitative, descriptive research, anchored in Occupational Science, carried out in an assistance unit in Physiotherapy and Occupational Therapy, with participants as twenty-five people who were in the postoperative period of cardiac surgery. The results revealed changes in the form, purpose, and meaning of the occupations. There was withdrawal or modification of these, followed by dissatisfaction with their performance, as well as the need to engage in significant occupations. The research contributed to the construction of scientific knowledge about the occupations of people in the cardiac postoperative period, highlighting that this process is unique and can have repercussions in different ways on occupations. Thus, it is emphasized on the importance of Occupational Therapy within this context as it allows an expanded view of these people, in their physical, psychological, social, and also occupational aspects.

Keywords: Cardiac Surgery, Postoperative Period, Occupational Therapy.

Resumo

As ocupações são ações realizadas durante a vida, que possuem forma, propósito e significado. O fato de ter sido submetido a uma cirurgia cardíaca, assim como ao

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processo de pós-operatório, pode influenciar no engajamento dessas ocupações. A fim de investigar essa questão, o estudo buscou compreender como se apresentam as ocupações de pessoas no pós-operatório de cirurgia cardíaca. Trata-se de uma pesquisa qualitativa, de caráter descritivo, ancorada na Ciência Ocupacional, sendo realizada em uma unidade de assistência em fisioterapia e terapia ocupacional, tendo como participantes 25 pessoas que se encontravam no pós-operatório de cirurgia cardíaca. Os resultados revelaram alterações em relação à forma, no propósito e significado das ocupações. Houve o seu afastamento ou modificação, seguidos da insatisfação quanto à sua realização, assim como a necessidade de se engajar em ocupações significativas. A pesquisa contribuiu para a construção de conhecimento científico sobre as ocupações de pessoas no pós-operatório cardíaco, destacando que esse processo é único e pode repercutir de diversas formas nas ocupações. Assim, ressalta-se sobre a importância da terapia ocupacional dentro desse contexto por possibilitar uma visão ampliada dessas pessoas, nos seus aspectos físicos, psíquicos, sociais e também ocupacionais.

Palavras-chave: Cirurgia Cardíaca, Período Pós-operatório, Terapia Ocupacional.

1 Introduction

Heart diseases are any type of pathology or dysfunction that affects the heart. In Brazil and developing countries, most of the hospitalizations due to heart diseases come from valve diseases (Tarasoutchi et al., 2011).

The interventions for heart diseases have three types of cardiac surgery: reconstructive, corrective, and substitute, depending on the degree of the impairment (Lira et al., 2012). The myocardial revascularization and valve replacement are the most common surgeries highlighted.

The indication for surgical intervention occurs after the precise diagnosis of the anatomy and functionality of the region and the study on the natural course of the disease, and after the clinical evaluation, such as physical examination and anamnesis (Tarasoutchi et al., 2011; Casalino & Tarassoutchi, 2012).

During the recoveries, in the physical sphere, the person is susceptible to sensations of pain, infections, invasive interventions, and risk of death. In the social area, the person is removed from living with friends and relatives during the hospitalization phase and his autonomy is shaken due to the limitations of the postoperative period (Santana et al., 2010). Furthermore, in the psychic sphere, anxiety can arise, having negative effects in the postoperative period and influencing the treatment, bringing physiological consequences, such as tachycardia, increased blood pressure, and worsening of the disease evolution (Assis et al., 2014).

In this sense, we observe that the person who experiences a heart disease and experiences cardiac surgery suffers direct daily impacts by the need to leave occupations, such as work, and to spend on medication, which often leads to financial dependence (Maldaner, 2014).

Also, complaints of depression and difficulties in engaging in sexual relationships are situations experienced by people in the cardiac postoperative period due to the use of

drugs that can lead to changes in mood, in the desire, and also in their sexual function (Radomski & Trombly, 2013).

Cardiac surgery also directly affects people's functional capacity. Functional capacity is the ability of people to decide and act in their daily lives independently (Barbosa et al., 2014). Thus, a surgical procedure can contribute to limiting the performance of daily occupations.

According to the American Association of Occupational Therapists (American Occupational Therapy Association, 2015), occupations occur throughout people's lives. Occupations are related to human development and personal well-being (Jonsson, 2008).

According to Carrasco & Olivares (2008), occupations are the result of the interactions between the person, the activity, and the environment where it takes place. Occupational Science is a science that studies the human being as an occupational being, including his needs and capacities to participate and adapt his occupations throughout his life (Yerxa et al., 1990). It is born during occupational therapy and studies human occupations seeking to understand its form, purpose, and meaning.

Due to the changes and all the conditions in the processes of heart disease and the occurrence of surgery, people in the cardiac postoperative period experience repercussions, including changes in the occupational repertoire, which can directly influence the form, purpose, and the meaning of these occupations. Therefore, this research aimed to understand the occupations of people in the postoperative period of cardiac surgery.

2 Methodology

This research was based on a qualitative descriptive approach, which seeks to understand the meanings and senses of the phenomena. Qualitative research aimed to understand the meanings of the phenomena, manifestations, occurrences, facts, experiences, or feelings, as all these representations are a way of structuring human life (Turato, 2005).

Qualitative research values the testimonies of the people who are participating in the research, obtaining interpretations of the participants' reports. It can be carried out through interviews and according to Fraser & Gondim (2004), it allows us to reach a level of understanding of human reality that becomes accessible through reports, appropriate for investigations whose objective is to know how people perceive the world.

2.1 Research place

The research took place in a cardiorespiratory physiotherapy outpatient clinic in a physiotherapy and occupational therapy care unit.

2.2 Research participants

Twenty-five (25) people who were undergoing cardiac rehabilitation at an outpatient cardiorespiratory physiotherapy clinic in a Physiotherapy and Occupational Therapy assistance unit participated in this research. The inclusion criteria were: People over

eighteen years old, who were in the postoperative period of cardiac surgery, treated at the unit by the Cardiorespiratory Physiotherapy service, and who accepted to participate in the research by reading and signing the informed consent form (ICF). People were named with random names for the preservation of identity.

2.3 Ethical procedures

This research is part of the results of the project entitled: “How are the occupations, occupational performance, quality of life and functional capacity of people in post-cardiac surgery”, from the Occupational Therapy Course at UFPA and funded by the *Programa Institucional de Bolsas de Iniciação Científica e de Desenvolvimento Tecnológico e Inovação PIBIC-CNPQ*, from UFPA.

It is also following the provisions of resolutions 466/12 and 510/16, both from the National Health Council (Brasil, 2012, 2016). The Research Ethics Committee involving human beings of the Institute of Health Sciences of the Federal University of Pará submitted and approved the project under number 2,361,459.

2.4 Data collection procedures

People were referred from a reference hospital for cardiac surgery in the region when they were discharged. With the referral, the outpatient team scheduled an initial evaluation and presented before the information about the research, its objectives to the research participant, followed by the reading of the Informed Consent Term (ICF). After this reading, in case of acceptance by each participant, they sign the informed consent form and the interview started, lasting approximately thirty minutes. The research took place from November 2017 to December 2018.

The interview script had two parts. The first part was about the socio-demographic information of each participant (gender, address, contacts, how long ago the surgery was performed, type of surgery, how many surgeries, time attending the sector, etc.) and the second part was about the following questions: “*Describe me what your occupations were like before you were here*”, “*Tell me: what do you do on a routine day in your life?*”, “*What is the meaning of these occupations?*” and “*What do these occupations mean to you today?*” These questions focused on knowledge and understanding of the occupations performed after cardiac surgery, and their purposes and meanings.

2.5 Data analysis procedures

The interviews were recorded and later transcribed. We used content analysis to treat the information, covering a set of strategies aimed to understand the reports of the material collected through interviews, or observation notes taken in the field diaries (Campos & Turato, 2009).

For Bardin (2009), content analysis is a set of techniques that analyze reports through systematic and objective procedures, describing the content of the messages. Thus, it means to explain the directions taken by the language reading text practices in the “science field”.

This analysis is commonly based on records and allows what we methodologically call inference, generally a passage of the premises under review through the text until the conclusion of the work. It means that, for the discussion of a topic in question, it is necessary to have a connection with propositions already accepted by the academic community, that is, a theoretical basis that can dialogue with the collected and analyzed data (Campos & Turato, 2009).

3 Results/Discussion

Twenty-five people (25) participated in this study. Most of them were male (n = 18), a characteristic found in other Brazilian studies, in which prevalence of more than 70% was also male participants when compared to females with people undergoing cardiac surgery (Vieira & Soares, 2017; Kaufman et al., 2018).

The mean age of the participants was 64.7 years old for women and 59.8 years old for men. Regarding marital status: fifteen (15) were married, four (04) widowed, three (03) single, two (02) reported a common-law marriage, and one (01) was separated. Regarding the education: eight (08) had incomplete elementary school, five (05) had completed elementary school, four (04) had incomplete high school, seven (07) had complete high school and only one (01) had complete higher education. The predominant type of surgery was twenty (20) with myocardial revascularization, three (03) with valve replacement, and one (01) with myocardial revascularization and valve replacement. One person did not inform the type of surgery.

Based on the data analysis, we identified the following categories: “Occupational changes: implications of cardiac surgery for human occupations”, “The occupational reasons in the experience of the cardiac postoperative period” and “Unveiling occupational meanings after cardiac surgery”.

3.1 Occupational changes: implications of cardiac surgery for human occupations

We observed modifications after the postoperative experience, changing occupations such as work and leisure. We also observed that work was manifested as one of the most impaired occupations in the post-surgical period since this occupation filled most of the routine of the participants in this study, with the time devoted to this occupation being the one with the greatest investment.

Before the surgery? Ah, I worked a lot, right? I left the house at seven in the morning and came back at seven at night, in the traffic..., because my activity demanded that [...] (BERNARDO).

According to Pettifer (1993), the work can be directly related to the construction and maintenance of a person's identity, feel competent, belonging and being one of the main structuring roles of society and its positioning in this environment.

The participants of this research reported exhaustive occupational day-to-day and revealed difficulties to be satisfactorily involved in other occupations. Lucas and Felipe highlighted a stressful and exhaustive occupation form before surgery, according to the following reports:

Ah, I used to work with buses, I did everything, it was a busy day. It did freight and it was busy, all day long. Seven to seven, a very stressful routine (LUCAS).

Ah, life was very busy. I got up early, I didn't have time to have lunch, I didn't have time to stop, the stress of traffic... It was a very, very bad life. Work was all day, every day (FELIPE).

The representation of work for these participants was related to something exhaustive and it was the main occupation carried out daily, revealing difficulties in trying other occupations.

According to Alves et al. (2016), the need for physical effort and exposure to stressful situations demand that people in the postoperative period change at work, which can culminate in emotional impacts, such as the feeling of worthlessness.

A study that compared the well-being of people satisfied with employment, dissatisfied people, and unemployed people showed that those who are dissatisfied can achieve similar levels of psychological distress for those who are unemployed (Pettifer, 1993).

In this context, some people may have difficulty organizing time and their routine and may have difficulties in how to occupy and fill in time, having to reorganize their entire occupational configuration (Jonsson et al., 2003).

Among the occupational forms, we highlight the manifestation of striking characteristics that involve the cultural environment in which the participant lived. Before the surgery, this person was inserted in a riverside context, with unique characteristics on the way to occupy the time, as can be seen in the following excerpt:

[...] my life is to work in the bush, to clear a bush, to plant, to harvest açai, to fish, the activities of the Interior even that we do, right? [...] it makes me want to move around a bit, [inaudible] doing any kind of service, it makes me want to work, harvest my açai. I clear the bush and prepare the açaisal, right? At that time, I took out the açai. Then, fishing with a fishing net, the hurdle, a pinhel, for my food, my survival (EDGAR).

The occupation is an action performed by people who are inserted within a social context. Alvarez et al. (2007) describe the concept of human occupation, mentioning that they are activities performed daily by people, who are culturally named and have meaning. The authors also reinforce that this concept includes fundamental aspects, such as the social construction of occupations, their ideological and cultural dimensions that are unique to the person who builds and performs them, revealing the importance of understanding how people are occupied and what their needs are in different contexts and situations.

The immediate postoperative period can impact not only on the performance of these occupations by the present limitations but also on the displacement of this person who comes from the interior of the state because right after the surgery, the person starts to dedicate most of his time to occupations related to health care.

Within this conjuncture is the riverside Amazonian man who lives amid customs that related to an environment that is bathed by the waters of rivers, streams, and forests that make up environmental and cultural specificities, as it was possible to perceive in

the participant's report. Thus, this whole context is manifested in occupations in which their work is their food, the very riverside survival in the state (Pojo et al., 2014).

When discussing occupation and productivity, we identify the report of women mentioning the double work shift. Over the years and the entry of women into the job market, the relationship they have with their occupations has changed, as they are no longer restricted to the home tasks alone.

Thus, there were changes in family structure and occupations. The man, who was previously the breadwinner, begins to share space with the woman, who is also inserted in the job market, but who now faces a reality that is still present today: the double workday.

Before the surgery, Luana and Julliana mentioned this reality. In addition to work-related occupations, the time spent on home-related occupations emerged in these women's reports, as you can see in the following reports:

[...] In the afternoon, the day I was on duty, I came back, if not, I would stay at home, an ... washing clothes, I do little cooking, but it is at the weekend, but cleaning the house, dishes, clothes, I did it [...] (BÁRBARA).

I worked at home, and I also worked in a store that I have building materials. I took care of the house and took care of the store at the same time (LUANA).

Before the surgery? I worked a lot, right? I worked at my house, took care of my things, I had a cafeteria, right? I did everything in my cafeteria, snacks, sweets, everything... (JULLIANA).

Among the repercussions of cardiac surgery in occupations, there are changes not only related to work but the domestic environment. Although the double workday consists of several occupations that can cause stress and tiredness, these women expressed the desire to return to their routine and return to performing their occupations.

[...] now, lately, after I had an operation, I don't do anything [...] *This arm sucks, just the left one works, and I'm not doing anything, no activity, nothing. I have five months of operation and the doctor told me to always rest and I already think this rest is bad, it makes me stressed! Sometimes, I get stress with my granddaughter just like that because it is a lot for her alone, and many times the person cannot wait* (JULLIANA).

Nobody knew anything, nobody knew a bank account, nobody knew an account number, now I'm passing through, it's getting easier, I'm passing everything..., nowadays I can already say that we can't live closed just for us, and I lived like that [...], because, if I want to live a little longer, I will have to share... Nowadays what do I do? I only order materials, make the list there, then the seller comes and they are already with me looking to learn... (LUANA).

In this context, even with the difficulties of being part of a broad occupational composition, work is still important as it represents economic independence, social recognition, and greater personal satisfaction. The possibility of work also has the

expansion of knowledge and social networks, helping in the formation of identity and providing feelings of autonomy, usefulness, competence, and better self-esteem (Barham & Vanalli, 2012).

Besides all these things, it is interesting how cardiac surgery can raise issues beyond physical repercussions. During the postoperative period, fear and insecurity regarding the performance of occupations are present. Uncertainties about the future and whether or not to carry out the occupations cause these feelings to be expressed in the reports of Frederico and Sofia:

The only difference, the only thing that I have difficulty, is working and having the same leisure that I had, right? Until it was completely cured, right? I don't know if it will stay, or not... [...] (FREDERICO).

And now I don't know how it will be, I think it will be summarized a little more, right? Because if I sewed from three to ten at night, I'll cut it down to three, four hours [...] (SOFIA).

Cardiac surgery appears as a possibility to improve the health of these people but it can awaken the feelings mentioned earlier due to how the postoperative period changes the occupational configuration. Before the surgery, these people could play ball, sew, sweep the house, among other tasks, and, in the post-surgery period, it may be necessary to interrupt them or adapt to new occupations. Thus, this can cause discomfort, fears, and doubts, expressed in questions that were common to several participants during the interview “*How will my life be now?*”, “*When can I sweep the house again?*”, “*When can I climb stairs again?*” These routine occupations in life were impaired during this process.

Thus, the person who goes through some illness due to cardiovascular diseases may have changes in his life, both by the heart disease and the surgery, directly interfering in his daily life, and having the need to leave the occupations, such as work (Maldaner, 2014).

On the other hand, there were reports from some research participants who mentioned that they were already retired before the postoperative process so they were away from their work-related occupations before the cardiac surgery:

My activities before having the surgery, as I am already retired, it was just taking my grandchildren and picking them up from school, right? And in these intervals, which is in the morning or the afternoon, I was doing research... self-didactic, in the mystical-philosophical sense. I am very attached to philosophy, especially to the spiritual aspect. I did this researching and also prepared courses, prepared speeches, and lectures (MARCO).

It is observed that, even though he was retired, there was a need to get involved in occupations. It is as if at that moment he was looking for alternatives to fill existing occupational gaps after retirement.

During the interview, the participant showed to understand the limitations faced after the surgery, but he felt uncomfortable in not being able to perform his occupations satisfactorily and looked for other possibilities. Thus, occupation is understood as an

aspect that structures daily life and that can contribute to the health and well-being of those who perform it (Vilela & Paulin, 2014).

On the other hand, another participant showed retirement as a similar connotation, but differing in some aspects. Unlike Marco, Sérgio saw this moment as a possibility to experience occupations that were not possible when he was involved in work-related occupations. If for one, retirement was a process that required the need to find other ways to stay useful, for another, it was a time of transformation and discovery, in which he started to have more time for his family and to perform related occupations leisure, as described in the following report:

Look, my leisure was minimal, minimal. So, every six months I would take a little trip there, sometimes I went to the countryside. I left seven in the morning and arrive at seven at night, right? My leisure is watching TV, I played with my grandchildren, but it was rare ... In the last year, after I retired, I enjoyed what I couldn't enjoy for the rest of my life, right? Traveling, having fun... I had more time for my grandchildren too, going to a party, social, which I could already attend because I no longer need to work the next day, right? Some things like that ... I could rest more! (SERGIO).

Retirement represents a major change in the life cycle and, during the change process, people can more easily perceive the different meanings of the occupations they perform (Jonsson et al., 2003). As leisure is an occupation that gives the possibility of personal choice, being something that the person accomplishes by feeling willing, it can enable a lighter and happier life (Martinelli, 2011).

In this sense, in leisure, the participants presented varied occupational forms in which they expressed how the postoperative influenced the occupations. Unlike productive occupations, although leisure was sometimes mentioned, the reports of research participants revealed that it was an occupation that ended up being neglected and that did not always receive importance regarding their occupational experimentation or that keeps an interpretation that distances these people of that occupation, but it was also mentioned as something important and needed.

For example, some participants stated that they were not frequently involved in occupations related to leisure, even before the surgical procedure. Although some reports related leisure to the occupation that should be outside the home or that required physical effort, we noticed several situations related to leisure, as described by Lucas and Paulo:

[...] on Sunday, I don't go anywhere because I don't have any sports, I don't like the ball [...] I prefer to stay at home listening to music over there, eating a barbecue when I can (inaudible) I don't drink too, right? [...] Then sometimes my grandson [inaudible] arrives and I keep chatting, playing with my grandchildren. There is a pool behind the house, the kids are playing there and we are assisting the children. But, apart from that, Thanks to God... (PAULO).

Look, leisure was very difficult, I hardly had it, because everything is my responsibility and then, how is it? I had to be ahead and walking was very little, very little, once in a while. At home, my leisure is to watch television, chat with

my wife there, a visit that I always had there, not football, just on television, that was life [inaudible] (LUCAS).

We also noticed that in the case of Lucas, leisure was in the background in the priority of his occupations, perhaps not by choice, but as an obligation to assist in family responsibilities. This, in a way, expresses that some actions are driven by obligations and that their interests and needs are not always taken into account (Martinelli, 2011).

Some people mentioned about the limitations in this process and how it influences the occupational form:

[...] It is sitting, lying down! Sitting watching football ... That's what I do, it's ... I'm more lying down. I walk, I can't ride a bike any more (MÁRCIO).

I left, I went to church, I had my jobs at the church. I went out! I left, everything that was a walk, like that, I went. [...] Now, I can't do what I used to do, for a year, a year and a half... I have to protect myself, right? (MANUFACTURE).

[...] Ah, after leaving the hospital I was still a little restricted to walking, now that I'm loosening up, I'm already going ... I can't drive there, I have to or take a taxi (BERNARDO).

These participants faced some limitations after cardiac surgery. They described the fear of making a physical effort. These participants reported that they were away from their leisure occupations and that the time was filled with occupations that do not require so much physical effort, but, in the case of Bernardo, at the time of the interview, he said that he was proposing alternatives to carry out his occupations to adapt to the reality of that moment.

Humanity has an occupational structure that undergoes changes and adaptations built unconsciously, but in some cases, these changes need a more conscious organization so that they can be carried out according to needs, demands, and interests (Díaz et al., 2008).

During the illness process, at the same time that there may be left from work, there may also be expenses with occupations that are related to health care and transportation, as most do not use transportation public during the postoperative period and had expenses with medications, among other expenses (Maldaner, 2014). Thus, occupations that needed financial investment were left in the background.

Occupations that fill free time are essential, however, were less frequent in daily life, according to Luana's report:

That's why I had to go out of my way to do things, it's ... like, leisure, going out, after he [her husband] got sick, life became more difficult, right? Then I would not go out for leisure anymore, very little, I had no way to go out, I have no way to go out! (LUANA).

Luana needed extra effort to leisure, even before cardiac surgery. Thus, as she reported about her double workday, her routine was tiring and filled with many occupations, but even so, he prioritized leisure occupations, mainly related to sport.

However, after her husband's illness process and her cardiac postoperative period, previously independent and autonomous in the choices of her occupations, she started to live with a reality that prevents her from doing what she liked most.

We notice the occupational limitations in the life of this participant during the interview. In their words, a feeling of discontent emerged, as if the post-operative was taking something very precious from her; as if leisure was a possibility of personal fulfillment expressed through her choices and interests (Martinelli, 2011).

Due to all the manifestations from the cardiac diseases, the occupational form of leisure proved to be one of the occupations influenced during the postoperative period. However, there are some interesting characteristics, because, although there is an idea that leisure can always be related to something good and beneficial, in some situations, leisure can be expressed in health risk behaviors, for example:

[...] I liked sports, I always like to play ball, or ... riding a bike, that was my sport, other than that, the only other sport I had was drinking, but it came to harm me, and a lot! I got to the point of almost dying, right? It gave my heart a problem (FREDERICO).

Alves et al. (2016) identified that, mainly in the male population, leisure was generally associated with alcohol consumption and eating foods with excess fat, conditions that may be linked to the cardiovascular health of these people, which may progressively lead to the need for surgical intervention. The same authors also highlighted the difficulty that men have in the necessary lifestyle changes after surgery, in which, in many cases, they end up distancing from many occupations because they are not satisfied with the new occupational reality.

3.2 The occupational reasons in the experience of the cardiac postoperative period

When thinking of a man as somebody who takes care of different occupations from the beginning of life, until the process of finitude: What would be the reason for that? What motivates people to perform occupations? What are the reasons for this action and how do they appear after heart surgery? These are present doubts, which instigate and arouse the need to research occupations.

Thus, after the journey through the occupation, the understanding of the meaning of these occupations now begins. Carrasco & Olivares (2008) elucidated that the function arises in the relationship between person and activity, and, as its name suggests, it is the most functional aspect of the occupations, being precisely the answer to the previous questions, as it is what motivates, is the reason and why the person gets involved in the occupations.

During the interview, when the participants reported on occupational reasons, they exposed information that revealed the objectives of the occupations they described. Ulisses mentioned about the occupations relating the continuity of life:

[...] I think it's the next, if I don't continue, I think it's easier for me to die, so, like this, I think I have to have activity because, when the mind is empty, it is easier for us to die (ULISSES).

In this scenario, the occupation has a sense of guaranteeing the maintenance of its existence. At that moment, although Ulisses was showing limitations in his daily life, during the interview he mentioned that he continued to work and perform most of his occupations.

As a craftsman, his hands were his main work tools. Ulisses highlighted at several times about the satisfaction he had in making his handicrafts, as this made it possible to experience all the senses that this occupation awakened in their life, revealing that, by taking care of his handicrafts, he is distanced from the feeling of death or the process of finitude, giving life to his existence. Other participants revealed a relationship between occupation and the feeling of feeling useful or necessary, according to the following reports:

I am that companion who seeks to share, if I am at home, I will not see my wife working alone, especially because we have no employee, so we have to take care. We have our dogs, that whole thing, right? So, I tried to help because I felt useful doing this type of thing [...] (BERNARDO).

The importance of taking my grandchildren is to feel useful for something at home, in the middle of the family, right. [...] Now, after the surgery, no, I couldn't do it anymore, move around like that (MARCO).

These reports showed the need to be involved in the occupations to nourish the feeling of remaining useful, able to contribute in some way with the people around them because “doing nothing as mentioned in several moments of the research carried a negative connotation and was related to the frustration of not feeling included in their environment. In some cases, cardiac surgery brought the feeling of uselessness in the participants, as if the postoperative period directly interfered with how the person visualizes himself after performing the occupations.

Changes, adaptations, and/or occupational losses, temporary or permanent, had repercussions on the lives of these people. Wottrich et al. (2016) in his research also mentioned that these changes bring feelings that are related to worthlessness, lack of autonomy, and uselessness.

These participants chose to perform their occupations as something positive, and perhaps this explains the reports of these participants during the interview, as they were satisfied with the recovery process and the return to the occupational repertoire. Although it was causing discomfort, they seemed to understand the moment they were experiencing.

The occupations were also expressed as a way to remain independent because having a dependence on others only to carry out and/or conclude an occupation brings frustration, fears, feelings of worthlessness, among others. In this sense, we observed that the occupations are unique, being the reason to perform them or the issues that vary according to who performs them.

If occupations can change from those who carry them out, depending on someone else to carry them out daily, they tend to change the form of performance and this is not always understood, especially in a process of pain not only physical but also the occupational risk of not being able to accomplish what they would like. This can cause

discontent for feeling limited during the postoperative period (Wottrich et al., 2016), as expressed by Julliana, when expressing the dissatisfaction after the surgery:

[...] Ah, the importance, I think that for me, I like everything clean at home. Sometimes, today, I get bored with that, because we have to wait for things there, it is very bad not to be able to fix your house, clean the house. Let's suppose a visit appears suddenly, the person with the dirty house [...] (JULLIANA).

Regarding the limitations of the postoperative process, Julliana reported on the influences of surgery for her day to day occupations right after the surgery, presenting limitations in several occupations in which she depended on her granddaughter to clean the house, cook, bathe, comb her hair, lie down or get out of bed. The postoperative period, in this case, had repercussions not only regarding the adaptations in performing the occupations right after surgery, but also in the life of the main caregiver who had an entire occupation at that moment needed to be modified so that it was possible to provide support for the grandmother during the postoperative period. This demonstrates another interface of the cardiac postoperative period, that is, the influences that these occupational difficulties can also have on the life of the caregiver.

In this sense, something very important to discuss is the possibility to choose how to occupy the time. When are you able to make that choice? Having the possibility and autonomy to choose the occupations of the occupational repertoire is a sensitive action as expressed in Sérgio's speech:

Look, it's something I liked, do you understand? Staying with the grandchildren, the parties ... Sometimes, at home, it was my only fun. But I didn't have time, right? When I started to have more time there, it was better, I did it because I always liked it. [...] well, I've lived my whole life when I worked outside, right? So, after I stopped, I prefer to stay at home (SÉRGIO).

This report showed the importance of making these occupational choices in life since from the moment he can choose and experience these occupations, it aroused the pleasure of being involved in the range of existing occupational possibilities. Ferreira & Barham (2011) affirm that being engaged in activities that provide pleasure is essential for maintaining personal well-being.

However, making these choices is not accessible to everyone. Although occupations can have a positive motivation, in some scenarios they can assume a negative condition because it is an action performed out of obligation, without the possibility of choice, or because it meets the needs of another person. For the International Society of Occupational Science (2013) and Magalhães (2013), occupations can be actions that include what the person needs, wants to do, and what they expect them to do. We can observe these characteristics in the following reports:

So, life was like that, I had no time and no whereabouts, it was something that the hour that came had to do to resolve it. There is no reason for anything special, right? It was a daily thing and it had to be that right there, I couldn't change it, very difficult, so that was it (LUCAS).

Ah, what a question ... is it because it had to be just me, my son, that I have at home... this girl here is married, lives in Manaus, and I have to be just myself to solve the things... (MAIARA).

In Lucas and Maiara's reports, the occupations were related to autonomy, power of choice, and satisfaction and now, they assume a completely different purpose, as the same possibilities were not given. We understood that situations like these can have a direct impact on how the person can be satisfied with their occupations and how this fulfills and gives meaning to the existing occupational composition.

At times, these occupations that were not the result of self-choice were expressed as actions that were affected, but not needed, nor was there was any discomfort due to this withdrawal. Maiara, for example, at one point in the interview, expressed that the occupations related to the home, although modified, were not being a problem, as she was satisfied with the fact that her daughter was doing them at that moment.

Finally, we need to understand the occupations of each person. Each person has a perception of their occupations, which are the result of a whole occupational life experience in which each person will answer questions related to occupational purposes.

3.3 Unveiling occupational meanings after a cardiac surgery

The meanings are the symbolic aspect of the occupation (Carrasco & Olivares, 2008). They depend on the lifelong experiences of those who perform the occupations, on the values, and on the person's interpretation based on their actions. Vinícius and Juliana expressed about the occupational need, demonstrating the desire to be involved again with occupations that needed to be changed due to the circumstances of that process:

For me, that is everything, right? I don't even know how to explain it to you, I just know what I wanted to do... I did not want, I want to, I want to do everything back (JULLIANA).

That means a lot, thank God! At that time, I was healthy [...] These activities mean a lot in my life, everything I've done, today, stopped, right? I can't do it... (VINÍCIUS).

The need to get involved in occupations was shown by the change in the satisfaction of being occupied, that is when there is a gap between what he needs and/or wants and what he does. The very understanding of being healthy changed from the removal of occupations; it is as if these people related the illness process to occupational distance and were able to measure their health status. Based on this understanding, there are impacts on health, on the quality of life, in which, based on a process of continuous adaptation in the occupational sphere, this person starts to adapt according to their characteristics and needs (Ruiz-Tagle et al., 2009).

Contributing to the discussion, other participants highlighted similar issues that further encourage what we said earlier, strongly relating occupations to well-being and health maintenance, and that, from the process of surgery and the cardiac postoperative

period, they perceived some meanings related to occupations and relationships with health and well-being, as mentioned by Fábrićia, Ulisses, and Alice:

Sis... I did it because I liked it... (FABRÍCIA).

For me they are important, it is an exercise, it is, how can I say, therapy, right? (ULISSES).

Ah, that felt good, right? Because doing all this, I felt healthy... then after I started feeling sick there [...] I felt healthy when I did everything (ALICE).

Piškur et al. (2002) mentioned the relationship between well-being, health, and occupation. In this study, the participants revealed to experience well-being as they were involved with their occupations, but, as soon as something favors the imbalance in the experimentation of these occupations, health and well-being are affected.

Health does not only mean physical, mental, and social aspects but also occupational issues. The participants' reports express the importance of the occupations and how the postoperative can awaken important meanings, in which enjoying the occupations can cause satisfaction, fill the needs and feed the feeling of well-being among these people who perceived the occupations as something with benefits.

The occupational meaning depends on the personal interpretation of each person when experiencing their occupations (Lillo, 2003). Thus, for some participants, the occupations had positive meanings (Lanzoni et al., 2015). Participants who highlighted these meanings reported about occupations that were performed before the surgical procedure as something fundamental, which met their personal needs:

Everything is pleasant. It's not a joke, no (VICTOR).

Ah ... what it means, like this, is that I do it like that, right? That way... I feel satisfied, [inaudible] it is very rewarding for me, right? (SOFIA).

It is not about “just” getting busy, it is about getting involved in occupations for personal satisfaction and the opportunity to exercise a sense of accomplishment by being able to do what is important and essential in their lives.

Given the understanding and demonstration of how occupations are essential, adaptable, and composed of different meanings, we identified how much the postoperative and its occupational repercussions can have an impact on these people's psychic aspects. Changes in occupational meaning can generate major existential crises (Lillo, 2003). During the interview, Paulo mentioned feeling moved by not being satisfactorily involved in his occupations:

[...] Let's assume it has a meaning. We are so excited about not being able to do things, right? So, let's suppose I want to say it like this, people think I'm useless to do things, then I say 'people I'm just operated, I'm not prostrate, I'm not, paralyzed to anything, I'm just recovering from an operation!' that's it (PAULO).

This participant expressed his concern for being away from doing what he would like to do. At this point, the fact that the physical repercussions were not his only limitations but the excessive care of caregivers and family members made him think he was being seen as a “useless person”. This behavior is the result of fear of loss that may come suddenly due to the characteristics of the people with cardiovascular diseases, but all of this generates discomfort in those who go through not only physical pain but the possible pain of limitations and frustrations of not being fully involved in their daily occupations.

Faced with what was mentioned earlier, frustration and sadness were also present feelings during the reports of Felipe, Márcio, and Frederico, for example. In some studies (Lanzoni et al., 2015; Erdmann et al., 2013), participants also had similar feelings during the process of experiencing cardiac surgery. In this sense, based on the reports of the participants in this research, we understood that the impossibility of satisfactorily engaging causes discomfort, that is, this duality between performing or not performing these occupations satisfactorily can cause a change in occupational meanings, as observed in the following reports:

Too bad, too bad. It is very bad. Because we are used to this system, right? That's where it gets to, right? (PHILIP).

It is frustrating, now, not being able to do more what I used to do (gets emotional). Yes, because I can't do the things I used to do (MÁRCIO).

Look, what I can't do for me now is sadness. Sad because I can't, it's not even that I can't, it's because I can't do it (FREDERICO).

Lillo (2003) mentioned that the meaning that each person adds to their occupations depends on different circumstances such as physical, social, or cultural, and the influence of beliefs, capacities, skills, and symbolism. Therefore, this path through the various interpretations and occupational meanings have shown that occupations can be related to both positive and negative meanings. Perhaps, awakening the feeling of a new opportunity to enjoy life “[...] *it is good when we are in a situation like that when we go out, we think 'Yeah, I was born again'*” (ULISSES).

Finally, as much as some participants manage to externalize the meanings in the postoperative words, some participants were unable to express what the occupations meant in their lives, perhaps due to the automatism of the occupations or because of questioning in an unexpected way: “*I can't say what it means, I can't*” (JOAQUIM). “*I can't answer...*” (MAIARA).

We believed that occupations are actions that feed the meaning of life, responsible for human existence. Whatever was the meaning attached to these people's occupations, it was possible to see how the surgery impacted occupational life. Being in the postoperative period brought feelings and concerns in these participants. The experience of feeling unable to do what they like, they are motivated, was expressed as something that bothered them, but that in some cases can be a bridge to new possibilities.

4 Final Considerations

The research aimed to understand the occupations of people in the postoperative period of cardiac surgery. In these situations, there may be several impacts on the occupational dimension represented by forms, purposes, or meanings that varied according to personal experiences.

The occupations of the participants changed. For those who presented work as the main daily occupation, we observed the loss of personal identity and the emergence of the feeling of worthlessness. Many of them were afraid to return to their day-to-day occupations, just as their relatives and family members also restricted them in this return.

The difficulty in organizing the routine, the insecurity regarding the return to occupations were also repercussions of the postoperative period. For others, it represented an opportunity to engage in occupations they did not have time before, having more possibilities of their choices.

The participants reported several motivations for the meaning of their occupations they performed and the ones in the process of being rescued. Issues around the family, self-choice, sense of usefulness were some of the most frequently mentioned positive connotations. There were also some reports in which people did not know their function in their occupations. However, there were those people who felt compelled to engage in something, out of obligation, in something they do not like or are unable to perform as they expected, a factor that promotes dissatisfaction.

We also that several meanings that emerged in the reports of the research participants, issues related to the present occupational need, the possibility of a new occupational life after surgery, and the pleasurable sensations caused by the performance of the occupations. There were also emotional repercussions related to fear of performing occupations and uncertainty about the future, as well as anguish and sadness for not being able to perform the occupations satisfactorily. The occupation was related to cultural factors and as something that directly affects the health and well-being of these people. Because it is a subjective and singular aspect, some people were unable to attribute any meaning.

Finally, we believed that this study can go through understanding the occupations of people in the cardiac postoperative period, contributing to the increase in the discussion about the occupational dimension and its particularities. The experience of being with these people made researchers even closer to understanding how important and essential occupations are in human life and how changes or withdrawal can have repercussions on different dimensions of the person.

The limitations of this research were the difficulty of finding theoretical references on the theme chosen from the occupational dimension in the research context when compared to other references. Thus, this research can contribute to the academic community, providing an increase of scientific material and learning within this field of research, an essential experience for the process of professional growth. Thus, we emphasized the importance of occupational therapy within this context, as it allows an expanded view of the human being in its physical, psychological, social, and occupational aspects.

References

- Alvarez, E., Gómez, S., Muñoz, I., Navarrete, E., Riveros, M., Rueda, L., Salgado, P., Sepúlveda, R., & Valdebenito, A. (2007). Definición y desarrollo del concepto de ocupación: ensayo sobre la experiencia de construcción teórica desde una identidad local. *Revista Chilena de Terapia Ocupacional*, (7), 76-82. <http://dx.doi.org/10.5354/0719-5346.2007.81>.
- Alves, M. P., Lanzoni, G. M. M., Koerich, C., Higashi, G. D. C., Baggio, M. A. & Erdmann, A. L. (2016). O processo de viver a cirurgia de revascularização cardíaca: uma análise de gênero. *Escola Anna Nery*, 20(4), e20160093. <http://dx.doi.org/10.5935/1414-8145.20160093>.
- American Occupational Therapy Association – AOTA. (2015). Estrutura da prática da terapia ocupacional: domínio & processo. *Revista de Terapia Ocupacional da Universidade de São Paulo*, 26, 1-49.
- Assis, C. C., Lopes, J. L., Nogueira-Martins, L. A., & Barros, A. L. B. L. (2014). Acolhimento e sintomas de ansiedade em pacientes no pré-operatório de cirurgia cardíaca. *Revista Brasileira de Enfermagem*, 67(3), 401-407. PMID:25054702.
- Barbosa, B. R., Almeida, J. M., Barbosa, M. R., & Rossi-Barbosa, L. A. R. (2014). Avaliação da capacidade funcional dos idosos e fatores associados à incapacidade. *Ciência & Saúde Coletiva*, 19(8), 3317-3325. PMID:25119071. <http://dx.doi.org/10.1590/1413-81232014198.06322013>.
- Bardin, L. (2009). *Análise de conteúdo*. Lisboa: Edições 70.
- Barham, E. J., & Vanalli, A. C. G. (2012). Trabalho e família: perspectivas teóricas e desafios atuais. *Revista Psicologia: Organizações e Trabalho*, 12(1), 47-59.
- Brasil. Conselho Nacional de Saúde. (2012, 13 de junho). Resolução nº 466, de 12 de dezembro de 2012. Normas e diretrizes regulamentadoras de pesquisas envolvendo seres humanos. *Diário Oficial [da] República Federativa do Brasil*, Brasília, seção 1.
- Brasil. Conselho Nacional de Saúde. (2016, 24 de maio). Resolução nº 510, de 7 de abril de 2016. Dispõe sobre as normas aplicáveis a pesquisas em Ciências Humanas e Sociais. *Diário Oficial [da] República Federativa do Brasil*, Brasília, seção 1.
- Campos, C. J. G., & Turato, E. R. (2009). Content analysis in studies using the clinical-qualitative method: application and perspectives. *Revista Latino-Americana de Enfermagem*, 17(2), 259-264. PMID:19551282. <http://dx.doi.org/10.1590/S0104-11692009000200019>.
- Carrasco, J., & Olivares, D. (2008). Haciendo camino al andar: construcción y comprensión de la ocupación para la investigación y práctica de la terapia ocupacional. *Revista Chilena de Terapia Ocupacional*, (8), 5-16. <http://dx.doi.org/10.5354/0719-5346.2008.55>.
- Casalino, R., & Tarassoutchi, F. (2012). Escores de risco nas intervenções em valvopatia. *Arquivos Brasileiros de Cardiologia*, 98(5), e84-e86. PMID:22858660. <http://dx.doi.org/10.1590/S0066-782X2012000500018>.
- Díaz, S. M., Encina, V. V., Sepúlveda, R., & Cáceres, G. G. (2008). OCUPARSE: Una propuesta de intervención con personas privadas de libertad basado en la ocupación. *Revista Chilena de Terapia Ocupacional*, (8), 37-46. Recuperado em 15 de abril de 2019, de <https://revistaterapiaocupacional.uchile.cl/index.php/RTO/article/view/71>
- Erdmann, A. L., Lanzoni, G. M. M., Callegaro, G. D., Baggio, M. A., & Koerich, C. (2013). Compreendendo o processo de viver significado por pacientes submetidos a cirurgia de revascularização do miocárdio. *Revista Latino-Americana de Enfermagem*, 21(1), 332-339. PMID:23546316. <http://dx.doi.org/10.1590/S0104-11692013000100007>.
- Ferreira, H. G., & Barham, E. J. (2011). O Envolvimento de idosos em atividades prazerosas: revisão da literatura sobre instrumentos de aferição. *Revista Brasileira de Geriatria e Gerontologia*, 14(3), 579-590. <http://dx.doi.org/10.1590/S1809-98232011000300017>.
- Fraser, T. D., & Gondim, S. M. G. (2004). Da fala do outro ao texto negociado: discussões sobre a entrevista na pesquisa qualitativa. *Paidéia*, 14(28), 139-152.

- Internacional Society of Occupational Science – ISOS. (2013). Recuperado em 15 de abril de 2019, de <http://www.isocsci.org>
- Jonsson, H. (2008). A new direction in the conceptualization and categorization of occupation. *Journal of Occupational Science*, 15(1), 3-8. <http://dx.doi.org/10.1080/14427591.2008.9686601>.
- Jonsson, H., Borell, L., & Sadlo, G. (2003). Jubilación: una transición ocupacional con consecuencias en latemporalidad, equilibrio y significado de la ocupación. *Revista Chilena de Terapia Ocupacional*, 3(3), 7-18. <http://dx.doi.org/10.5354/0719-5346.2003.145>.
- Kaufman, R., Azevedo, V. M. P., Sá, R. M. G., Geller, M., Xavier, R. M. A., Chaves, R. B. M., & Castier, M. B. (2018). Características epidemiológicas e preditores de mortalidade em pacientes maiores de 70 anos submetidos à revascularização miocárdica cirúrgica. *International Journal of Cardiovascular Sciences*, 31(3), 258-263. <http://dx.doi.org/10.5935/2359-4802.20180020>.
- Lanzoni, G. M. M., Higashi, G. D. C., Koerich, C., Erdmann, A. L., & Baggio, M. A. (2015). Fatores que influenciam o processo de viver a revascularização cardíaca. *Texto & Contexto - Enfermagem*, 24(1), 270-278. <http://dx.doi.org/10.1590/0104-07072015003760012>.
- Lillo, S. G. (2003). La ocupación y su significado como factor influyente de la identidad personal. *Revista Chilena de Terapia Ocupacional*, 3(3), 43-47. <http://dx.doi.org/10.5354/0719-5346.2003.149>.
- Lira, A. L. B. C., Araújo, W. M., Souza, N. T. C., Frazão, C. M. F. Q., & Medeiros, A. B. A. (2012). Mapeamento dos cuidados de enfermagem para pacientes no pós-operatório de cirurgia cardíaca. *Revista da Rede de Enfermagem do Nordeste*, 5(13), 1171-1181.
- Magalhães, L. (2013). Ocupação e atividade: tendências e tensões conceituais na literatura anglófona da terapia ocupacional e da ciência ocupacional. *Cadernos de Terapia Ocupacional da UFSCar*, 21(2), 255-263. <http://dx.doi.org/10.4322/cto.2013.027>.
- Maldaner, C. R. (2014). *Cuidado de si de indivíduos após cirurgia de revascularização miocárdica* (Dissertação de mestrado). Universidade Federal de Santa Maria, Santa Maria. Recuperado em 15 de abril de 2019, de <https://repositorio.ufsm.br/handle/1/7395>.
- Martinelli, S. A. (2011). A importância de atividades de lazer na terapia ocupacional. *Cadernos de Terapia Ocupacional da UFSCar*, 19(1), 111-118.
- Pettifer, S. (1993). Leisure as compensation for unemployment and unfulfilling work: reality or pipe dream? *Journal of Occupational Science*, 1(2), 20-26. <http://dx.doi.org/10.1080/14427591.1993.9686380>.
- Piškur, B., Kinebanian, A., & Josephsson, S. (2002). Occupation and well-being: a study of some Slovenian people's experiences of engagement in occupation in relation to well-being. *Scandinavian Journal of Occupational Therapy*, 9(2), 63-70. <http://dx.doi.org/10.1080/110381202320000043>.
- Pojo, E. C., Elias, L. D., & Vilhena, M. N. (2014). As águas e os ribeirinhos: beirando sua cultura e margeando seus saberes. *Revista Margens Interdisciplinar*, 8(11), 176-198. <http://dx.doi.org/10.18542/rmi.v8i11.3249>.
- Radomski, M. V., & Trombly, C. A. (2013). *Terapia ocupacional para disfunções físicas*. São Paulo: Santos Editora.
- Ruiz-Tagle, A. E., Lerdo de Tejada, P. O., & Riquelme Echeverría, V. (2009). Explorando necesidades ocupacionales: un estudio de caso. *Revista Chilena de Terapia Ocupacional*, 9(9), 117-131. <http://dx.doi.org/10.5354/0719-5346.2009.88>.
- Santana, J. J. R. A., Fernandes, L. F. B., Zanin, C. R., Waeteman, C. M., & Soares, M. (2010). Grupo educativo de cirurgia cardíaca em um hospital universitário: impacto psicológico. *Estudos de Psicologia*, 27(1), 31-39. <http://dx.doi.org/10.1590/S0103-166X2010000100004>.
- Tarasoutchi, F., Montera, M. W., Grinberg, M., Barbosa, M. R., Piñeiro, D. J., Sánchez, C. R. M., Barbosa, M. M., & Barbosa, G. V. (2011). Diretriz Brasileira de Valvopatias SBC 2011: I Diretriz Interamericana de Valvopatias - SIAC 2011. *Arquivos Brasileiros de Cardiologia*, 97(5, Suppl. 1), 1-67. <http://dx.doi.org/10.1590/S0066-782X2011002000001>.
- Turato, E. R. (2005). Métodos qualitativos e quantitativos na área da saúde: definições, diferenças e seus objetos de pesquisa. *Revista de Saúde Pública*, 39(3), 507-514. PMID:15997330.

- Vieira, C. A. C., & Soares, A. F. C. (2017). Perfil clínico e epidemiológico dos pacientes que realizaram cirurgia cardíaca no hospital Sul Fluminense - HUSF. *Revista de Saúde*, 8(1), 3-7.
- Vilela, J. M., & Paulin, G. S. T. (2014). Estou me aposentando, e agora? Contribuições da Terapia Ocupacional na reorganização do cotidiano. *Cadernos de Terapia Ocupacional da UFSCar*, 22(3), 497-505. Recuperado em 15 de abril de 2019, de <http://www.cadernosdeterapiaocupacional.ufscar.br/index.php/cadernos/article/view/952>.
- Wottrich, S. H., Quintana, A. M., Crepaldi, M. A., Oliveira, S. G., & Quadros, C. O. P. (2016). A cirurgia cardíaca, o corpo e suas (im) possibilidades: significados atribuídos por pacientes pós-cirúrgicos. *Psicologia em Revista*, 22(3), 654-671. <http://dx.doi.org/10.5752/P.1678-9523.2016V22N3P654>.
- Yerxa, E. J., Clark, F., Frank, G., Jackson, J., Parham, D., Pierce, D., & Zemke, R. (1990). An introduction to occupational science, a foundation for occupational therapy in the 21st century. *Occupational Therapy in Health Care*, 6(4), 1-17. PMID:23931133. http://dx.doi.org/10.1080/J003v06n04_04.

Author's Contributions

Emily Farias Maia and Tarciana Martins da Silva Ventura participated in the project, obtaining, analyzing and discussing the data, and preparing and reviewing the text. Luiz Fábio Magno Falcão and Airle Miranda de Souza participated in the review of the text. Victor Augusto Cavaleiro Corrêa coordinated and guided the research, analyzing, discussing and interpreting the data, and preparing and reviewing the text. All authors approved the final version of the text.

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