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# Fatigue pictogram during the use of chemotherapeutic drugs intended to breast cancer treatment

Pictograma de fadiga durante o uso de quimioterápico no tratamento do câncer de mama

Pictograma de fatiga durante el uso de quimioterapia en el tratamiento del cáncer de mama

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**Abstract: Objective:** To identify the most critical period of fatigue during doxorubicin + cyclophosphamide protocol followed by docetaxel in women with breast cancer using the fatigue pictogram. **Method:** descriptive, prospective study with quantitative approach. For better monitoring, patients were evaluated on the day of chemotherapy infusion and the next two weeks by telephone contact. **Results:** In the first stage of treatment, fatigue was less severe and had little interference with women's daily activities. During docetaxel infusion, fatigue was more pronounced and recurrent, presenting lower recovery rates and having a strong impact on the performance of usual activities. **Conclusion:** The fatigue pictogram proved to be an easy to understand and quick application instrument, and can contribute to nursing care as it is an important monitoring tool.
**Descriptors:** Nursing; Fatigue; Breast neoplasms; Antineoplastics

**Resumo: Objetivo:** identificar o período mais crítico da fadiga durante a quimioterapia com protocolo doxorrubicina + ciclofosfamida seguido de docetaxel em mulheres com câncer de mama utilizando o pictograma de fadiga. **Método:** estudo descritivo, prospectivo com abordagem quantitativa. Para um melhor monitoramento, as pacientes foram avaliadas no dia da infusão do quimioterápico e nas duas semanas seguintes por meio do contato

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telefônico. **Resultados:** na primeira etapa do tratamento, a fadiga ocorreu em menor gravidade e teve pouca interferência no desempenho das atividades diárias das mulheres. Durante a infusão do docetaxel a fadiga foi mais acentuada e recorrente, apresentando menores índices de recuperação e tendo forte impacto sobre a execução das atividades habituais. **Conclusão:** o pictograma de fadiga demonstrou ser um instrumento de fácil compreensão e rápida aplicação, podendo contribuir no cuidado de enfermagem na medida em que se apresenta como um importante instrumento de acompanhamento.
**Descritores:** Enfermagem; Fadiga; Neoplasias da mama; Antineoplásicos

**Resumen:** **Objetivo:** identificar el período más crítico de fatiga durante el protocolo de doxorrubicina + ciclofosfamida seguido de docetaxel en mujeres con cáncer de mama utilizando el pictograma de fatiga. **Método:** estudio descriptivo, prospectivo, con enfoque cuantitativo. Para una mejor monitorización, los pacientes fueron evaluados el día de la infusión de quimioterapia y las siguientes de las semanas por contacto telefónico. **Resultados:** En la primera etapa del tratamiento, la fatiga fue menos severa y tuvo poca interferencia con las actividades diarias de las mujeres. Durante la infusión de docetaxel, la fatiga fue más pronunciada y recurrente, presentando tasas de recuperación más bajas y teniendo un fuerte impacto en el desempeño de las actividades habituales. **Conclusión:** El pictograma de fatiga demostró ser un instrumento fácil de entender y de aplicación rápida, y puede contribuir al cuidado de enfermería, ya que es una herramienta de monitoreo importante.
**Descriptores:** Enfermería; Fatiga Neoplasias de mama; Antineoplásicos

## Introduction

Despite advances in early detection and treatment, cancer remains one of the most feared diseases due to its association not only with death but also with decreased quality of life. Pain, depression, and fatigue are among the most common cancer-related symptoms.[1]

A research performed mainly with women bearing breast cancer suggests that the prevalence of moderate to severe fatigue during chemotherapy might be as high as 60%.[2] This symptom may be present during the stressful process of diagnosis and can increase during therapeutic management, when it usually declines with the treatment conclusion. Nevertheless, it might persist in clinically healed patients.[3]

Although considered one of the most prevalent and debilitating symptoms, it is not always appreciated by health professionals. Fatigue can be defined as an unpleasant and multifactorial sensation, as it involves physical, psychic and emotional aspects, also it varies concerning the duration and intensity and is related to tiredness that does not diminish with energy restoration strategies, thus impairing the performance of everyday activities.[4] Several

factors may contribute to the inadequate management of this symptom, such as: incomplete and imperfect understanding of the physiology of fatigue, effective limitation of its treatment and lack of tools for its evaluation. On the other hand, patients often end up not reporting their condition for some reasons, including considering the normal symptom due to the severity of their general condition or because they do not believe in the ability of physicians to offer beneficial interventions, or even because they are unaware of the existence of effective treatments.[5]

Bearing the aforesaid in mind, the challenge is to draw even more attention from health professionals to the importance of recognizing and actively addressing cancer-related fatigue and its treatment. Subjectivity and multidimensional nature are factors that make the assessment of fatigue difficult.

The strategy commonly used to try to reduce bias in the measurement of subjective symptoms in cancer patients, but which needs regular and comparative assessment is the use of visual analog scale or numeric scale. In this regard, the instruments for identification and clinical follow-up of subjective symptoms, such as pain, depression, and fatigue, should be highlighted.[1]

Given the aforementioned, it is reasonable to admit that this proposition finds its relevance in the daily lives of professionals who give support to patients affected by fatigue during and after breast cancer control chemotherapy, considering that through this approach it is possible to assess the evolution of women who experience such condition. Hence, the research question was as follows: what is the most critical period of fatigue experienced by women bearing breast cancer during doxorubicin + cyclophosphamide protocol followed by docetaxel? To answer such question, this study meant to identify the most critical period of fatigue during doxorubicin + cyclophosphamide protocol followed by docetaxel in women bearing breast cancer through the use of fatigue pictogram.

## Methods

This is a descriptive and prospective study with a quantitative approach, which was carried out at the chemotherapy center of a private clinic located in the *Rio de Janeiro* city, Brazil. Data collection took place from March to December 2017, where the total sample was obtained by convenience, then resulting in 15 (fifteen) women aged 18 years old or older, all bearing breast cancer, regardless of the disease stage, starting chemotherapy with doxorubicin + cyclophosphamide followed by docetaxel, neoadjuvant or adjuvant therapy. The research participants signed the Informed Consent Form (ICF), after being informed about the study's objective.

The inclusion criteria were as follows: being 18 years old or older; be aware of cancer diagnosis and treatment; be able to communicate verbally to answer questions during data collection and have access to a telephone line to be followed at a distance. The exclusion criteria have considered patients who had to change their treatment regimen due to antineoplastic resistance during treatment or who had some serious drug toxicity, and also death before the end of treatment.

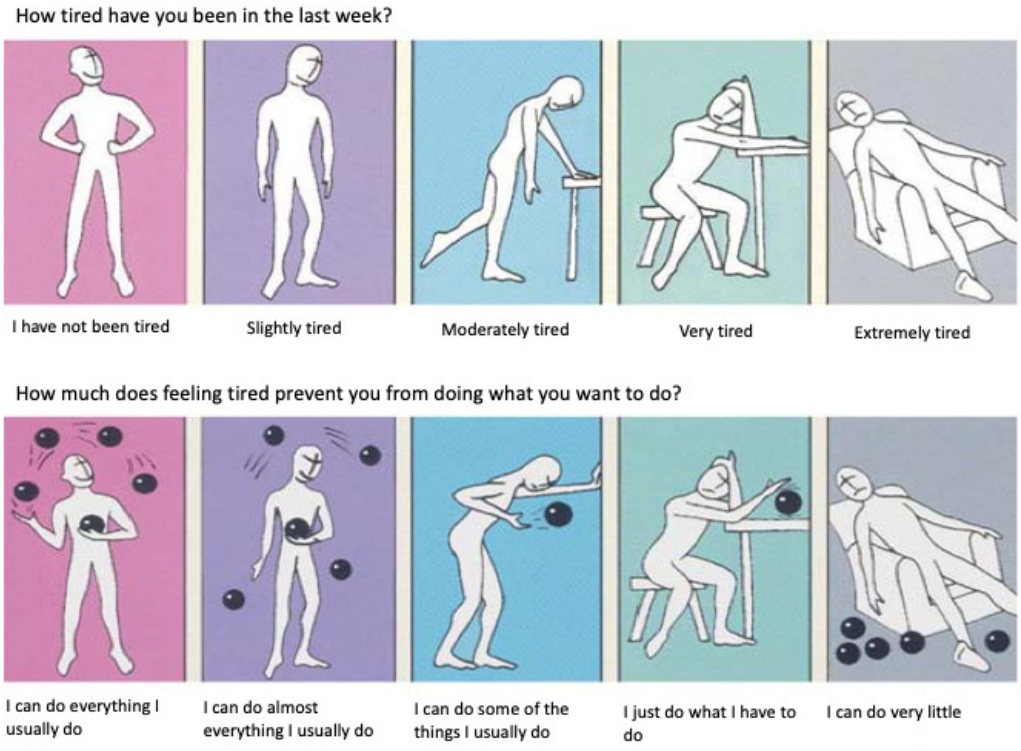
In order to establish the link between professional and patient, the researcher was responsible for the first nursing consultation. At the end of the consultation and after clarifying all doubts, the patient was approached to participate in the research. At this point, the fatigue assessment instrument was presented and explained. It should be noted that the chemotherapy protocol to which these women were submitted consists of four applications of doxorubicin + cyclophosphamide, followed by four applications of docetaxel, all with 21-day intervals and an average duration of five months. The answers about the fatigue pictogram were collected before the beginning and at the end of the treatment, when the researcher reinforced how to interpret

the fatigue pictogram, providing the printed evaluation scale, glued on a cardboard and laminated, which served to next steps of remote monitoring via telephone.

Targeting to achieve better monitoring of fatigue throughout the chemotherapy treatment, the researcher was responsible for the assessment of fatigue in all ambulatory chemotherapy cycles and contacted the patient by telephone on the eighth and fifteenth day after each application. This approach was taken because, according to the medical literature, symptoms are more prevalent during these chemotherapy periods, and through the pictogram provided at the first visit, the researcher was able to better assess the level of fatigue at home. Thus, each woman was assessed for fatigue level in eight face-to-face consultations and sixteen telephone contacts, totaling 24 moments. The data obtained were tabulated and analyzed using Microsoft Excel Office software, version 2010, presented in tables and graphs in which the frequencies of the findings were calculated and discussed according to the present-day literature.

The Fatigue Pictogram is an instrument composed of two questions that assess the intensity of fatigue and its impact on daily activities. Each item is valued using captioned illustrations. For each question five captioned illustrations are answered. Through this scale, it is possible to assess the intensity of fatigue (not tired, slightly tired, moderately tired, very tired and extremely tired) and the impact of fatigue on daily activities (I can do everything I usually do, I can do almost everything I usually do, I can do some of the things I usually do, I just do what I have to do and I can do very little),[4] as exemplified in Figure 1.

**Figure 1** - Fatigue pictogram.




Source: Fatigue pictogram: an alternative for assessing both intensity and impact of fatigue, 2009. Brazil.[5]

This instrument was validated in Brazil,[5] having as participants of the study, cancer patients in various stages, caregivers of cancer patients and nursing students. The results showed that the psychometric properties of the Fatigue Pictogram were satisfactory only for patients and not for caregivers and students. This instrument has been shown to have good validity and good stability in cancer patients at various stages of the disease.[6]

This study complied with the guidelines on research with human beings, according to the Resolution 466/12 from the National Health Council. It was approved by the Ethics Committee of the *Universidade Federal do Estado do Rio de Janeiro* on 06/30/2014 under the Legal Opinion No. 704,968.

## Results

Fifteen women bearing breast cancer who underwent chemotherapy with the doxorubicin + cyclophosphamide protocol followed by docetaxel participated of this study. One patient was excluded because she presented treatment toxicity from the second application of docetaxel, requiring a protocol change.

The participants showed an average age of 57.3 years old. Regarding the marital status, most were married 35.71% (n=5), followed by single 28.57% (n=4), divorced 21.43% (n=3) and widowed 14.29% (n=2). Concerning the level education, 50% (n=7) had completed high school, 21.43% (n=3) elementary school, 14.29% (n=2) higher education, 7.14% (n=1) kindergarten education, and only 7.14% (n=1) have done postgraduate education.

Considering the participants' work positions, most were retired 42.86% (n=6), followed by waged 35.71% (n=5), housewife 14.29% (n=2) and self-employed 7.14% (n=1). Observing the history of the current disease, there was a predominance of the neoadjuvant modality 57.14% (n=8). The other women had adjuvant treatment 42.86% (n=6), in which all underwent axillary dissection, 66.67% (n=4) underwent mastectomy, 33.33% (n=2) segmentectomy and only 16.66% (n=1) underwent breast reconstruction.

Half of the sample had hypertension as pre-existing disease, whereas diabetes and depression were identified in only 14.29% of the sample. Considering the total sample, 13 women reported not having routine physical exercise and only one has the habit of performing physical exercises routinely.

For better identification of the fatigue level during the chemotherapy treatment, each woman was weekly evaluated: on the day of ambulatory chemotherapy (D1), on the eighth day (D8) and on the fifteenth day (D15) after medication administration. Thus, face-to-face assessment in "D1" was performed in all of them, in a total of 56 evaluations due to the mandatory presence of these for the application of ambulatory chemotherapy.

Nonetheless, the assessments “D8” and “D15” did not reach the totality, as they were performed by telephone and sometimes people were not found in their homes or did not answer the cell phone. Therefore, regarding the first stage of treatment consisting of the administration of doxorubicin + cyclophosphamide drugs, the total of evaluations on the eighth day (D8) was 51 and on the fifteenth day (D15) only 47.

In regard to the docetaxel application phase, 49 evaluations were obtained at time D8 and 42 evaluations at time D15. Hence, during the research 301 (89.58%) evaluations were performed and only 35 (10.42%) evaluations were lost due to the above factors. The following percentages in this paper took as a whole (100%) the number of evaluations performed that varied due to the difficulties above-mentioned.

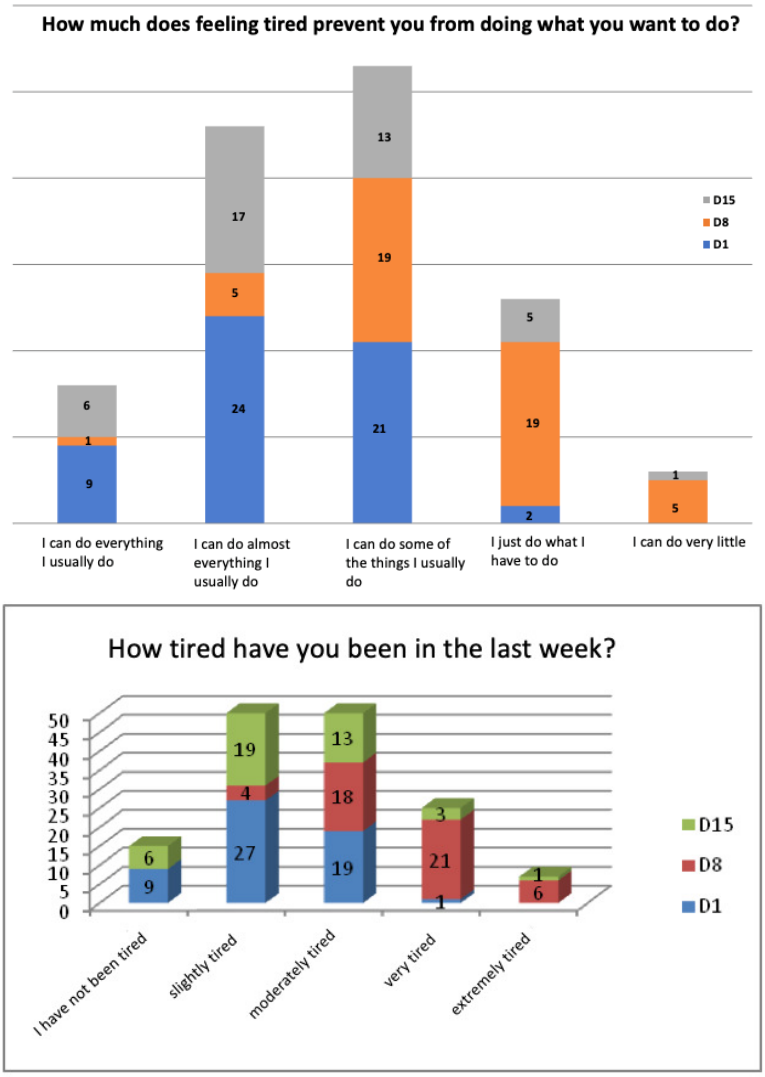
The present study is one of the few to follow weekly fatigue levels in women bearing breast cancer throughout chemotherapy treatment. The therapeutic protocol is divided into two phases, the first consisting of four sessions of doxorubicin + cyclophosphamide followed by four more docetaxel applications, so these medications are administered at different times and have different side effects. Thus, the assessment of fatigue was performed at each stage of treatment and was divided into four graphs for better understanding and dimensioning of the symptom.

In the first stage of treatment, 44.64% (n=25) participants fully recovered on the day of ambulatory chemotherapy (D1) or started the protocol without fatigue, as they reported that they were not feeling tired, 44.64 % (n=25) women had mild tiredness, 8.93% (n=5) moderate tiredness and only 1.79% (n=1) very tired. During the first week (D8), 29.41% (n=15) participants reported no tiredness, 31.37% (n=16) mild tiredness, 25.49% (n=13) moderate tiredness, 11.77% (n=6) very tired and only 1.96% (n=1) extremely tired. By the fifteenth day (D15), the symptom was poorly reported in most individuals, since 40.42% (n=19) had already recovered, 42.55% (n=20) noticed a slight tiredness, 14.9% (n=7) a moderate tiredness and only 2.13% (n=1) an extreme tiredness.

Concerning the interference of tiredness on routine tasks, on the day of ambulatory treatment, 46.43% (n=26) of the participants reported no limitations in their daily lives, 42.86% (n=24) reported that they could do almost Of all that makes up their routine, 7.14% (n=4) women reported limitations for some things and another 3.57% (n=2) estimated that they would only do the usual things that were really necessary. During the first week (D8), the number of patients who were not affected in their routine decreased 29.41% (n=15) could do everything and 33.33% (n=17) almost everything and, thus, the number of patients with daily limitations increased, with 12 (23.53%) patients who were still able to obey some of the routines and 6 (11.77%) who only did the indispensable ones. Only 1 (1.96%) was prevented from performing any routine task.

In the second week (D15), still regarding the routine, a considerable portion of the patients was recovered, increasing the number of individuals who were not affected by fatigue in their routine, 19 (40.42%) and 21 (44.68%) could either do all or almost everything respectively, and the most severe indicators were less frequent among the answers being 6 (12.77%) patients who did some of the tasks and again only 1 (2.13%) patient could perform very little. the routines. Figures 2 and 3 show the assessment of the fatigue level during the administration of doxorubicin + cyclophosphamide.

**Figures 2 and 3** - Fatigue follow-up in women undergoing chemotherapeutic treatment with doxorubicin + cyclophosphamide using the Fatigue Pictogram instrument.




Source: research data, *Rio de Janeiro* State- 2017.

In the second stage of treatment, which includes docetaxel applications, the study showed that the level of fatigue increased significantly concerning the previous stage and that there was an impact on the decrease of daily activities. Most patients 48.21% (n=27); assessed the level of fatigue as mild on the day of treatment (D1), 33.93% (n=19) as moderately tired, 1.79% (n=1) as very tired, thus not fully recovering from previous cycles. Only 16.07% (n=9) women report being completely restored of the symptom in D1.

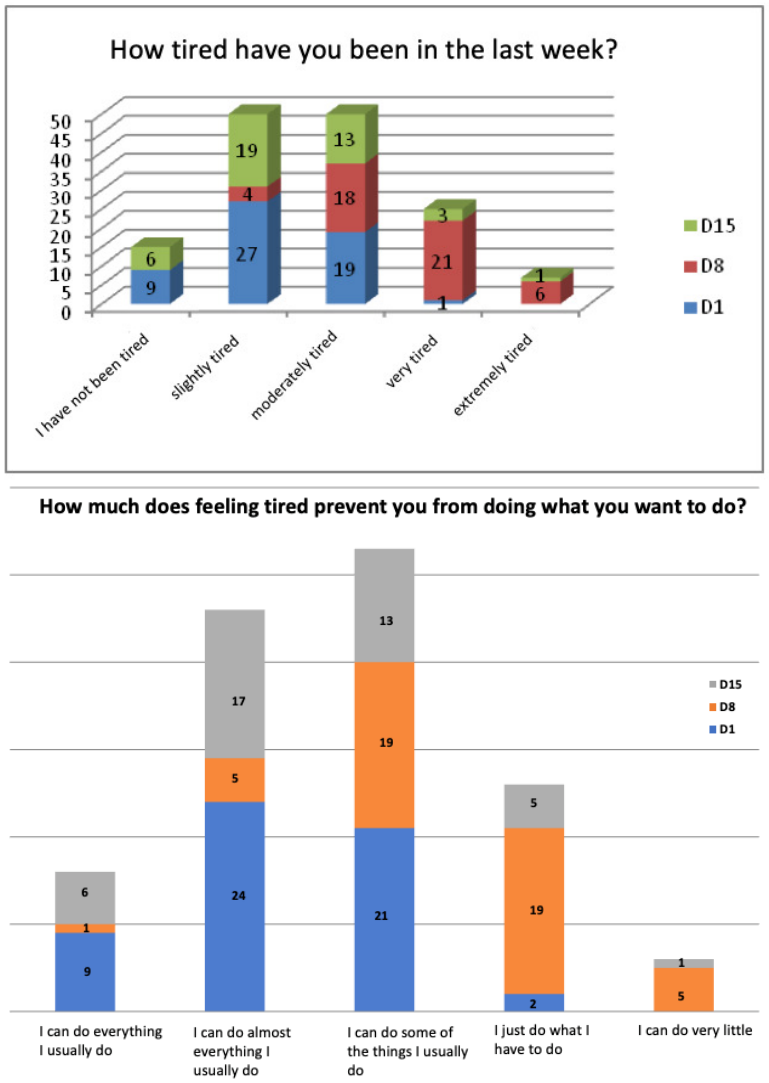
The following week (D8) the intensity of fatigue increased abruptly, showing a preponderance between "very tired" 42.86% (n=21) and "moderately tired" 36.74% (n=18), 8.16% (n=4) subjects reported mild tiredness and 12.24% (n=6) as extremely tired. On the fifteenth day

(D15) after medication administration there was a reduction of the symptom in most participants, as 14.29% (n=6) patients were reinvigorated, 45.24% (n=19) reported being "slightly tired", 30.95% (n=13) moderately tired, 7.14% (n=3) very tired and only 2.38% (n=1) extremely tired.

With regard to the daily activities, on the day of treatment (D1) 16.07% (n=9) patients reported that they were performing normally all their tasks, 42.86% (n=24) did almost everything, 37.5% (n=21) some things and 3.57% (n=2) only the necessary. In the following week (D8), there was a significant limitation in the performance of daily activities, 10.20% (n=5) women reported doing almost all tasks, 38.78% (n=19) just some things, 38.78 % (n=19) only the relevant, 10.20% (n=5) were unable to perform any task, and exclusively 2.04% (n=1) expressed no inability of performing the daily tasks.

On the fifteenth day (D15), there was a significant reestablishment in the accomplishment of the usual tasks, 40.48% (n=17) were performing almost all their activities; 14.29% (n=6) did not show any impediment in the performance of tasks; 30.95% (n=13) performed almost everything, 11.90% (n=5) the essential and only 2.38% (n=1) was unable to perform any activity. Figures 4 and 5 describe the assessment of the fatigue level during the docetaxel administration phase.

**Figures 4 and 5** - Fatigue follow-up in women undergoing chemotherapeutic treatment with docetaxel using the Fatigue Pictogram tool.




Source: research data, *Rio de Janeiro* State- 2017.

## Discussion

Despite scientific evidence reporting that chemotherapy results in oscillation of fatigue throughout chemotherapy treatment, studies have assessed the presence of this symptom daily or weekly,[2-3] they have evaluated the symptom periodically, usually on the day of chemotherapy infusion. However, research taking into account only the day of treatment does not fully demonstrate the experience after home medication infusion, as peak fatigue was not identified,

and patients usually receive treatment on the day with the lowest level of fatigue. as they need to be re-established for the next cycle.[5,7]

This symptom has a negative impact on work, social relationships, mood, and daily activities, as well as significantly affecting overall quality of life during and after treatment and is considered a predictor of lower survival rates. Some studies in chemotherapy patients bearing breast cancer suggest that fatigue has a roller coaster-like pattern, as levels are higher during the first week after chemotherapy infusion and then begin to decrease before chemotherapy. next application.[6-8] Herein, it was evident that fatigue occurs throughout the two stages of chemotherapy treatment. Nevertheless, in the first stage, the symptom was less severe, and most patients were able to recover until the day of the next chemotherapy infusion, not affecting the patients' daily activities. Regarding the second stage of the protocol, with the infusion of docetaxel, this symptom was more pronounced and recurrent throughout the treatment, presenting lower recovery rates for the application day of the next chemotherapy cycle.

Bearing in mind the impact of fatigue on nursing care, it has been included as a variable in several studies due to its high prevalence and impact on the quality of life of these women. Given its complexity, it is included in the Nanda International (NANDA-I) classification of Nursing Diagnoses (ND), which describes many Defining Characteristics (DCs) that must be present for the diagnosis to be established. The ND named Fatigue has sixteen DCs, most with symptom subjectivity, a factor that can make it difficult to identify. Here, it is emphasized that proper identification of an ND is of fundamental importance in guiding medical interventions.[9-12]

The D8 assessment showed higher symptom numbers in quantity and severity, having a strong impact on the execution of daily activities. Therefore, the follow-up during the treatment showed that the fatigue was progressive and had significant repercussions in the accomplishment of the usual activities. A study[7] performed with 130 women bearing breast

cancer showed that the prevalence of nursing diagnosis for fatigue was estimated at 21.9% by the latent class model. These women had their ability to maintain their usual level of physical activity. This result demonstrates that this indicator may be the best measure to determine the early stages of fatigue, such as nursing diagnosis.

A study[8] also concluded that fatigue decreased the performance of routine activities, just as women undergoing mastectomy had higher levels of fatigue regardless of the chemotherapy treatment adopted compared to those who underwent segmentectomy. Another relevant finding was that patients submitted to a greater number of radiotherapy sessions and shorter intervals between the last radiotherapy procedure and symptom measurement reported higher fatigue level.[8,13]

Early detection of this symptom, using appropriate scales, is relevant to propose appropriate treatments and achieve better clinical conditions, adherence, and continuity of treatment. However, the health professional had the knowledge that fatigue rarely appears as an isolated symptom, is often associated with other symptoms such as pain, depression, sleep changes, anemia, and cachexia, among others, thus constituting a grouping of symptoms.[9] Hence, investigation and treatment of related symptoms should be part of the therapeutic conduct of fatigue.

This symptom can have an extremely negative impact on patients' quality of life and daily activities and may interfere with treatment adherence and, consequently, affect compliance with the proposed treatment regimen or even cause premature discontinuation.[10] The use of appropriate scales It is very important to detect fatigue as a symptom and to propose appropriate treatments. Compliance and continuity of treatment directly depend on patients achieving the best clinical picture possible, which in turn depends on effective follow-up by the healthcare professional. Such efficacy also includes the necessary sensitivity from the health professional in understanding that fatigue rarely appears as an isolated symptom, being due to

or may result from another symptom or the grouping of several of them. So, the therapeutic conduct of fatigue requires that follow-up include the perception and investigation of other symptoms.[8,10,13]

## Conclusions

Herein, the participating women had an average age of 57.3 years old, therefore, a group still young, half of them with an average level of education. Only five were employed and most were probably retired due to illness. Fatigue occurred throughout the first two stages of treatment, but with docetaxel, this symptom was more pronounced and recurrent throughout treatment. Accordingly, daily activities such as walking, exercising, cleaning the house, cooking and even eating can become major challenges. Limitations of cancer and its treatment are also associated with a progressive loss of muscle mass, reducing muscle strength and the patient's ability to perform simple tasks.

The use of the Fatigue Pictogram can significantly contribute to nursing care as it is an important, simple and inexpensive follow-up instrument. Moreover, there are a number of advantages provided by the adoption of the scale, including evaluation, monitoring and standardization of the registry, the improvement of the provided care and, especially, the conception of nursing care indicators for patients with fatigue, which is very useful considering the high incidence rates of this symptom among women undergoing chemotherapy.

This instrument has been shown to be easy to understand and quick to apply. Its best use has been verified in the 21-day interval protocols with weekly patient evaluations, since if asked to the patient on the day of treatment “how tired have you been in the last week” the most critical period of the symptom will not be identified, as the recovery period will be already in place.

Based on this study, it is highlighted the relevance of knowing and applying monitoring tools toward the population assisted, with the purpose of minimizing costs and increasing the comfort of these women, encouraging their active participation in treatment and less suffering in the rehabilitation process. Furthermore, it is envisioned to stimulate the production of studies that can establish the use of the fatigue pictogram in the most diverse care situations. The main limitation is the possibility of some bias from the answers obtained by telephone, as well as the impossibility of a more refined statistical analysis due to the sample size.

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**1 – Daniele Copello Vaz**
Designing and planning the research project; data collection, analysis and interpretation; writing.

**2 – Viviane Reis Fontes da Silva**
Critical review.

**3 – Roberto Carlos Lyra da Silva**
Critical review.

**4 – Luiz Carlos Santiago**
Critical review.

**5 – Carlos Roberto Lyra da Silva**
Data analysis and interpretation; writing; critical review.

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