

Correlation between fatigue and quality of life in patients pediatric oncology

Correlação entre fadiga e qualidade de vida em pacientes oncológicos pediátricos

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Abstract

Estimates of pediatric cancer by 2022 are 8,500 / year of new cases, which then leads to being considered a public health problem. In addition, cancer treatment can lead to various problems, including fatigue, impacting the quality of life of these patients. Thus, this study aims to correlate fatigue and quality of life in pediatric cancer patients undergoing treatment. A cross-sectional study was carried out, in which 30 patients participated, divided into “outpatient group” and “inpatient group”, according to the place where the data collection was performed. Demographic and clinical data were obtained and two questionnaires were then applied: fatigue (PedsQL™ Multidimensional Fatigue Scale) and cancer-related quality of life (PedsQL™ Pediatric Quality of Life™ Cancer Module). Most of the participants were male and with a mean age of 14 ± 2.89 , among the types of cancer presented, leukemia was the most prevalent (43.33%). The inpatient group had more fatigue and less quality of life. life when compared to outpatient, Still, when correlating in general, fatigue has a negative impact on the quality of life of pediatric cancer patients. Therefore, the values presented in this study, point out that fatigue and quality of life are closely linked and that studies are needed in order to develop rehabilitation protocols and, mainly, to create better health conditions and encourage the oncological patient to become functional and independent. with better chances of survival.

Keywords: Adolescent; Cancer; Fatigue; Son; Quality of life.

Resumo

As estimativas do Câncer pediátrico até 2022 é de 8,5 mil/ ano de novos casos, o que leva então a ser considerado um problema de saúde pública. Além disso, o tratamento contra o câncer pode acarretar vários sintomas, entre eles, a fadiga, causando impacto na qualidade de vida desses pacientes. Dessa forma, esse estudo tem como objetivo correlacionar a fadiga e qualidade de vida em pacientes oncológicos pediátricos em período de tratamento. Foi realizado um estudo transversal, no qual participaram 30 pacientes, divididos em “grupo ambulatorial” e “grupo enfermaria”, conforme o local onde foi realizada a coleta dos dados. Foram obtidos dados demográficos e clínicos e posteriormente procedeu-se aplicação de duas sessões: fadiga (PedsQL™ Multidimensional Fatigue Scale) e qualidade de vida relacionada ao câncer (PedsQL™ Pediatric Quality of Life™ Cancer Module). Uma maioria dos participantes eram do sexo masculino e com média de idade de $14 \pm 2,89$, dentre os tipos de câncer apresentados, a leucemia foi a mais predominante (43,33%). quando comparados ao ambulatorial, Ainda, ao se correlacionarem de maneira geral, a fadiga impacta na qualidade de vida dos pacientes oncológicos pediátricos. Portanto, os valores apresentados nesse estudo, apontam que fadiga e qualidade de vida estão intimamente ligados e que se faz necessário estudos a fim de desenvolver protocolos de reabilitação e principalmente, criar melhores condições de saúde e estimular que o paciente oncológico se torne independente funcional e com melhores chances de sobrevivência.

Palavras-chave: Adolescente; Câncer; Fadiga; Filho; Qualidade de vida.

Resumen

Las estimaciones de cáncer pediátrico para 2022 son de 8.500/año de casos nuevos, lo que lleva entonces a que se considere un problema de salud pública. Además, el tratamiento del cáncer puede generar varios problemas, incluida la fatiga, que afectan la calidad de vida de estos pacientes. Por lo tanto, este estudio tiene como objetivo correlacionar la fatiga y la calidad de vida en pacientes oncológicos pediátricos en tratamiento. Se realizó un estudio transversal, en el que participaron 30 pacientes, divididos en “grupo de pacientes ambulatorios” y “grupo de pacientes hospitalizados”, según el lugar donde se realizó la recolección de datos. Se obtuvieron datos demográficos y clínicos y luego se aplicaron dos cuestionarios: fatiga (PedsQL™ Multidimensional Fatigue Scale) y calidad de vida relacionada con el cáncer (PedsQL™ Pediatric Quality of Life™ Cancer Module). La mayoría de los participantes eran del sexo masculino y con una edad media de $14 \pm 2,89$ años, entre los tipos de cáncer presentados, la leucemia fue la de mayor prevalencia (43,33%). El grupo de pacientes hospitalizados tenía más fatiga y menos calidad de vida en comparación con el ambulatorio. Aún así, cuando se correlaciona en general, la fatiga tiene un impacto negativo en la calidad de vida de los pacientes con cáncer pediátrico. Por lo tanto, los valores presentados en este estudio, señalan que la fatiga y la calidad de vida están íntimamente ligadas y que se necesitan estudios para desarrollar protocolos de rehabilitación y, principalmente, para crear mejores condiciones de salud y incentivar al paciente oncológico a volverse funcional e independiente con mejores posibilidades de supervivencia.

Palabras clave: Adolescente; Cáncer; Fatiga; Hijo; Calidad de vida.

1. Introduction

Cancer is one of the main causes of death from disease in Brazil (Kushi, 2012). In addition to access to diagnosis, the increase in the number of cases of neoplasms may be related to environmental conditions, resulting in changes in the genetic material of children and adults (Garófolo, et al., 2004; INCA, 2019).

Considered a public health problem, it is estimated that 10.5 thousand children aged up to 15 years will be diagnosed with some type of cancer in 2021 (American Cancer Society, 2021). Similar to the USA, estimates on cancer in Brazil for the 2020/2022 triennium indicate about 8,500 new cases for each year in the pediatric age group (INCA, 2019).

The most common types of cancer among children and teenagers are leukemias, central nervous system tumors and lymphomas. Patients living in developed countries and those whose families have a better income have shown progress in the results of pediatric cancer treatment due to the use of better therapeutic options and early diagnosis (American Cancer Society, 2019; INCA, 2019), which positively impacts both survival and quality of life.

Cancer treatment entails clinical manifestations that will influence the functionality of individuals, among them, we find fatigue (Ministério Da Saúde, 2017). Fatigue is the personal impression of reduced performance to start or continue some type of activity, and this reduction is not related to depression or loss of muscle strength (Jorgensen, 2008; Pankanin, 2018).

Cancer-related fatigue is common among patients undergoing treatment, possibly related to pain, sleeping disorders or reduced physical activity (Weis, 2011; Byar, 2006), or even existing without these factors. Its origins are still unknown, but it is possible that all patients who undergo cancer treatment may suffer from some degree of fatigue (Franc, et al., 2014). Due to its complexity, the treatment of pediatric cancer patients requires a multidisciplinary approach. Physiotherapy plays an important role in this approach, which aims to the return of the patient's daily activities, pain relief, decreasing fatigue and overall functional improvement (Barro, et al., 2014).

Quality of life can be compromised by chronic fatigue and is considered an important marker in the assessment of the physical and psychosocial status of patients affected by some disease. In cancer treatment, it is considered as one of the main goals in controlling, curing and prolonging the life of patients (Fonseca, et al., 2014). Previous studies have identified compromised quality of life in adult patients undergoing cancer treatment. Among the reasons mentioned by patients, fatigue is one of the most common (Frikkel, et al., 2020). The need to identify this association in children and adolescents was previously mentioned (Nunes, et al., 2017), to support specific intervention proposals for the pediatric age group. Thus, the aim of this study is Correlate fatigue and quality of life in pediatric cancer patients in treatment period.

2. Methodology

This is a cross-sectional, observational study with a quantitative approach that was carried out in a public pediatric oncology service, the only in the state serving exclusively the Unified Health System and is linked to a general hospital located in the capital city of a state located in the northeastern region of Brazil.

Children and teenagers between eight and 19 years old who were undergoing cancer treatment were considered eligible. The eight years old limit is due to the restrictions on the survey's application. Patients were included sequentially and those who were unable to complete the surveys were excluded. Those who had other pathologies not related to an oncological disease, but who could also have fatigue, were not included.

The research was approved by the Research Ethics Committee of the Universidade Tiradentes (CEP/UNIT) through Plataforma Brasil, under ruling No. 2,142,939, as well as to the Center for Permanent Education of the Hospital de Urgências de Sergipe (NEP/HUSE), following the rules of Resolution No. 466/2012 of the National Health Council (CNS). Participants signed the Informed Consent Form (TALE), and their guardians signed another specific Informed Consent Form (ICF). Afterwards, those responsible for the patients answered a form with identification, disease and treatment data. After this stage, two assessment instruments were applied:

1) PedsQL™ Multidimensional Fatigue Scale: aimed at measuring fatigue in pediatric cancer patients, it was developed by Varni et al. (2002), it is composed of 18 items distributed in three dimensions: General Tiredness (6 items), Sleep Fatigue /Rest (6 items), Mental Fatigue (6 items). The scale was translated and validated for Portuguese by Nascimento, et al (2014).

2) PedsQL™ 3.0 “Pediatric Quality of Life™ Cancer Module, is an instrument developed by Varni et al (1998) and later translated and validated for Portuguese. Portuguese by Scarpelli, et al (2008), to assess the impact of the disease and treatment on the quality of life of individuals affected by childhood cancer (Queiroz, 2015). It is a multidimensional instrument, composed of 27 items, distributed in eight dimensions: pain (two items), nausea (five items), anxiety regarding the procedure (three items), anxiety regarding treatment (three items), concerns (three items), cognitive difficulties (five items), perception of physical appearance (three items) and communication (three items), according to Scarpelli et al. (2008). For both scales, the score was obtained through five Likert-type response options (zero=never, 1=almost never, 2=sometimes, 3=often and 4=always) with the response values inversely transformed into a scale 0 to 100, that is, 0=100, 1=75, 2=50, 3=25 and 4=0. Thus, higher scores indicate that the patient has less difficulty in performing the activities described, that is, the higher the score, the less fatigue and better quality of life these patients have (Varni, et al., 2002).

After collection, the data were grouped into: “Outpatient Group” (OG), which consisted of patients undergoing outpatient treatment at the time of data collection, and “Inpatient Group” (IG), consisting of patients who were undergoing his/her treatment their treatment admitted to the hospital when questionnaires were applied.

The data was arranged in a Microsoft Excel® 2016 spreadsheet and later converted to a software for statistical treatment using the Statistical Package for the Social Sciences (SPSS) program. For the analysis, continuous quantitative variables were presented as mean and standard deviations. The variables were tested for normality using the Kolmogorov-Smirnov test. In the comparison between groups, the averages were assessed using the t test. Pearson's correlation test was used for correlation analysis. Values of $p < 0.05$ were considered significant.

3. Results

Thirty patients were studied, 19 in AG and 11 in IG. The mean age was 14 ± 2.89 years, 70% of whom were male. As for education, 40% attended elementary school, 50% high school, 10% higher education (10%). There was a predominance of

patients with leukemia (43.33%), followed by sarcomas (20%) lymphomas (16.67%), carcinomas (13.33%) and CNS tumors (6.67%) (Table 1).

Table 1 – Demographic characteristics of the research participants (n = 30).

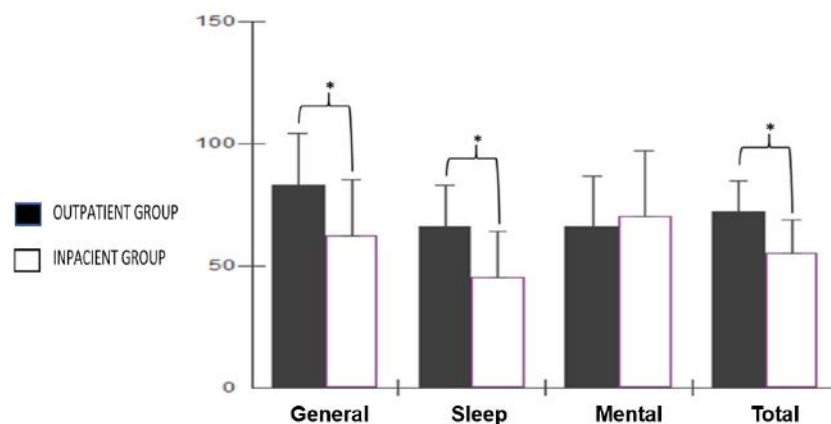
VARIABLES	OG	IG	TOTAL
Age	Mean ± SD 14 ± 2,78	Mean ± SD 14 ± 3,05	Mean ± SD 14 ± 2,89
Gender	n (%)	n (%)	n (%)
Male	13 (68,42)	08 (72,73)	21 (70)
Female	06 (31,58)	03 (27,27)	09 (30)
Schooling			
Elementary school	08 (42,11)	04 (36,37)	12 (40)
High School	10 (52,63)	05 (45,45)	15 (50)
University education	01 (05,26)	02 (18,18)	03 (10)
Pathology			
Leukemia	9 (29,99)	04 (13,34)	13 (43,33)
Sarcoma	06 (20)	0 (0)	06 (20)
Lymphoma	04 (13,33)	01 (3,34)	05 (16,67)
Carcinoma	2 (6,66)	2 (6,66)	04 (13,33)
Tumor CNS	0 (0)	2 (6,67)	02 (6,67)

Values presented as mean ± standard deviation, absolute and relative value (%). Legend: OG: Outpatient group, IG: Inpatient group, SD: Standard Deviation.

Source: Authors.

When assessing the results of the Multidimensional PedsQL™ Fatigue Scale application the average scores was 65.86 ± 14.85 , 72 ± 12.88 for GA and 55 ± 13.89 for GE. There was difference between the scores in general fatigue ($p = 0.038$) and fatigue in relation to sleep ($p = 0.006$), as well as in the total score ($p = 0.023$) when comparing OG and IG, with patients from the OG showing less fatigue than those of IG (Figure 1).

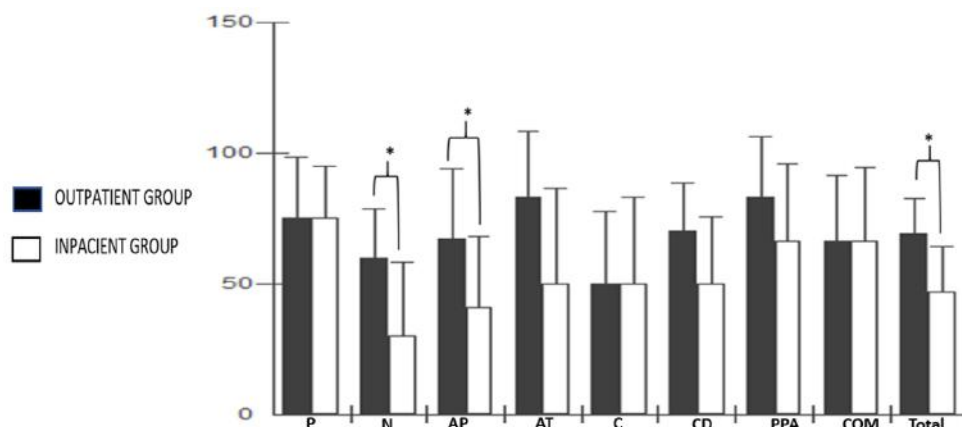
Figure 1 - PedsQL™ Multidimensional Fatigue Scale in the OG and IG groups.



Data presented as mean ± standard deviation. Paired t-test for comparison between OG and IG: General Tiredness ($p = 0.038$), Tiredness in relation to Sleep ($p = 0.006$) and Total Score ($p = 0.023$). Source: Authors.

Estimating the results of the PedsQL™ 3.0 “Pediatric Quality of Life™ Cancer Module application, it was found that the average score was $63.75 \pm 17, 21, 69 \pm 13.76$ for GA and $47 \pm 17, 33$ in the GE. There was difference between the scores regarding nausea ($p = 0.031$) and anxiety about the procedures ($p=0.006$) as well as in the total score ($p = 0.021$) with the OG patients presenting better quality of life scores than those of IG (Figure 2).

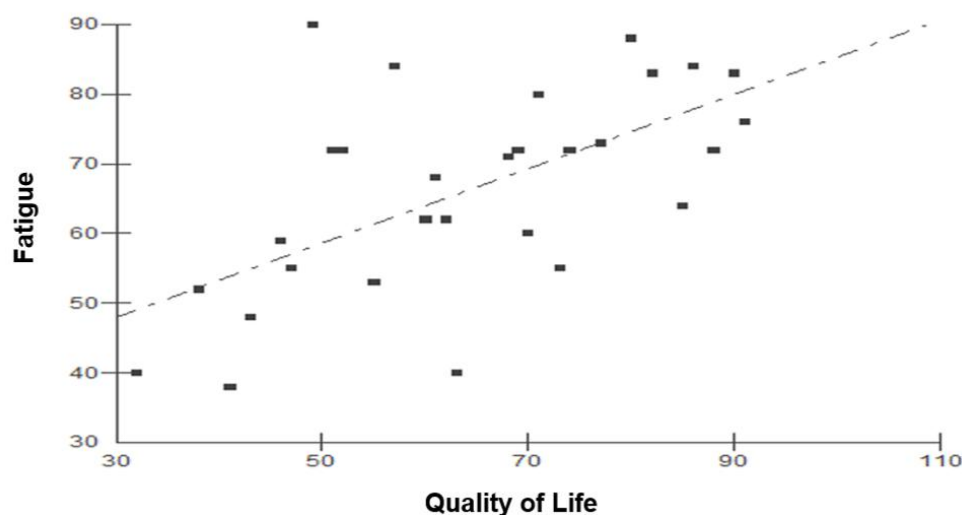
Figure 2 - PedsQL™ 3.0 “Pediatric Quality of Life™ cancer module in the OG and IG groups.



Data presented as mean \pm standard deviation. Paired t-test for comparison between OG and IG: Dimensions Nausea ($p = 0.031$), Anxiety regarding the procedures ($p = 0.006$) and Total Score ($p = 0.021$). Legend: P (Pain), N (Nausea), AP (Anxiety about the Procedure), AT (Anxiety about the Treatment), C (Concerns), CD (Cognitive Difficulties), PPA (Perception of Physical Appearance), COM (Communication). Source: Authors.

When fatigue is correlated with quality of life for patients in the IG and OG (Figure 3), statistical significance ($p=0.000$) and a strong correlation coefficient ($r=0.612$) were observed. In this sense, it appears that the more fatigue, the worse the quality of life (Figure 3)

Figure 3 – Correlation between fatigue and quality of life using the PedsQL™ Multidimensional Fatigue Scale and PedsQL™ 3.0 “Pediatric Quality of the Life™ cancer module” scales involving all patients.



Data presented through Pearson’s correlation. Strong correlation coefficient ($r = 0.612$), ($p = 0.000$). Source: Authors.

4. Discussion

The present study investigated two variables that have been gaining prominence in recent years in cancer treatment: fatigue and quality of life. The sample consisted of patients who fit the pediatric age group and were assisted in a referral hospital in the state of Sergipe.

The mean age found in this research was 14 ± 2.89 years. Lower ages were found in the study by Galassi et al. (2021). Of the 30 research participants, most were in high school, with a predominance of males, and were undergoing treatment for leukemia. Similar studies, such as the one by Huang et al (2018), showed a predominance of male participants. Also, according to the Sergipe State Department of Health, through estimates from the Population-Based Cancer Registry (RCBP), there was parity regarding the predominance of sex and type of cancer, with leukemia as the main type of cancer in children and adolescents (Lima, 2017).

Fatigue is considered a possible determining factor for decreasing in quality of life on cancer patients, including the pediatric age group (Borges, 2018). However, there are not many studies that seek to identify and measure the association between the two variables.

Evaluating the results of the application of the PedsQL™ Multidimensional Fatigue Scale in the present study, it is observed that the IG presented a mean of 55 ± 13.89 for the total score; 62 ± 23.10 for general tiredness, 45 ± 19.21 for sleep fatigue and 70 ± 27.21 for mental tiredness. Thus, with an average equal to or less than at 70 points in all domains, it is concluded that the fatigue reported by the participants may have been an obstacle to carrying out their activities. Nunes et al. (2017), when evaluating fatigue in hospitalized patients during cancer treatment, obtained a total score of 63.8 ± 18.5 . Checking the scores in dimensions isolated, the same author found an average of 66 ± 18.7 for general tiredness, 58.7 ± 20.8 for sleep-related tiredness and 66.7 ± 25.1 for mental tiredness.

Children and adolescents undergoing cancer treatment have reduced feelings of well-being and willingness to physical activity, as well as physical and mental damage to health, which has an impact on quality of life (Kowaluk, et al. 2019). In this study, there was a difference between EG and GA in the domains of general tiredness ($p=0.0386$) and tiredness in relation to sleep ($p=0.0063$), as well as in the total score ($p=0.0239$), Nascimento et al. (2014) also observed a difference in the dimensions general tiredness ($p=0.026$) and sleep-related tiredness ($p=0.007$) but not in the score total for quality of life, a difference observed in the present study. A prospective cohort study included 132 children and adolescents with cancer at three different times of treatment during one year (Coça et al., 2019). It was observed that the domains that most impacted quality of life were: anxiety about the procedures (which varied from 64.22 ± 34.09 at the beginning to 71.08 ± 34.21 at the end of the assessment) and worry (increase from 52.72 ± 31.40 to 59.50 ± 31.18) values that were respectively higher and similar to those of the present study.

Among the results, it is observed that the mental fatigue domain was the only one in which the patients involved in the research and who were in the IG had a higher score when compared to the OG. Studies such as Davies et al. (2002) and McCabe (2009) show that factors such as reduced routine activities, sleep disturbance, reduced school attendance, mood changes and hospitalization can mentally influence cancer patients.

Associating fatigue and quality of life, the present study found a strong and statistically significant correlation between these two variables, with values of $r=0.613$ and $p=0.003$ respectively. Erickson et al. (2011) found a moderate correlation in their study, with values varying between $r=0.49$ to 0.55 and $p<0.01$ in cancer-related quality of life. Nunes et al. (2017), also evaluating the relationship between fatigue and quality of life, finding a strong and statistically significant correlation between these variables ($r=0.74$, $p=0.000$).

Because it is a self-report of children, even if they are oriented, there is a possible risk of bias for the results, since it is not known for sure how the direct perception of the real feelings related to the disease. Other limiting factors for the present

work is due to the small value of the sample, as well as little discussion in the literature focused specifically on these two themes and age group.

On the other hand, the research differential is the possibility that, from the results presented, specific protocols can be created that will benefit these patients during the treatment period and insert them in their daily activities in a functional and independent way, as well as, create a more sense critical of health professionals in order to reduce possible clinical manifestations that lead to suffering and worse prognosis for patients.

The overall values of the fatigue and quality of life scale shown in this study had their means closely similar. In this sense, the quality of life of the evaluated patients was affected as the fatigue presented by them increased, since fatigue is considered a direct predictor of the quality of life of cancer patients (Spathis et al., 2017). This study observed a strong correlation between fatigue scores and quality of life, so that the higher the fatigue score, whether in general, sleep-related or mental, the worse the quality of life.

5. Conclusion

In view of the above, it is observed that patients undergoing cancer treatment have fatigue, and those who were in an outpatient clinic reported better scores when compared to hospitalized patients.

In addition, it was possible to identify a strong correlation between fatigue and impairment of quality of life, which justifies the proposal to create physiotherapeutic rehabilitation protocols especially developed for the prevention and treatment of fatigue in children and adolescents undergoing cancer treatment, with a view to improving their quality of life.

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