

# Sleep disorders in men with prostate cancer undergoing hormone therapy

*Distúrbios do sono em homens com câncer de próstata em hormonioterapia*  
*Trastornos del sueño en hombres con cáncer de próstata y terapia hormonal*

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## ABSTRACT

**Objective:** To analyze sleep patterns and quality of life of men with prostate cancer undergoing hormone treatment, prior or subsequent to radical prostatectomy and/or radiotherapy. **Methods:** Cross-sectional study with quantitative approach. Fifty men were interviewed between February and May 2012 using the Pittsburgh Sleep Quality Index (PSQI) and the European Organization for Research and Treatment of Cancer (EORTC-QLQ-C30). **Results:** The Pittsburgh's global average score was 8.76, indicating poor sleep quality. Most of the correlations among the dimensions of the EORTC-QLQ-C30 were statistically significant. The scores were strong to moderate for symptoms and functional capacity. **Conclusion:** Men, in general, experienced sleep disorders and decreased quality of life, showing a need for planned care in order to minimize treatment side effects.

**Keywords:** Nursing; Prostatic Neoplasms; Sleep disorders; Quality of life.

## RESUMO

**Objetivo:** Analisar o sono e a qualidade de vida em homens com câncer de próstata submetidos à hormonioterapia, anterior ou posterior a prostatectomia radical e/ou radioterapia. **Métodos:** Estudo transversal com abordagem quantitativa. Foram entrevistados 50 homens entre fevereiro e maio de 2012, utilizando-se o Índice de Qualidade de Sono de Pittsburgh (PSQI) e o *European Organization for Research and Treatment of Cancer* (EORTC-QLQ-C30). **Resultados:** Pontuação global de Pittsburgh com média de 8,76, indicativo de má qualidade de sono. Em relação às correlações entre as dimensões do EORTC-QLQ-C30, os escores de sono mostraram-se de forte a moderado para as funções sintomas e capacidade funcional, sendo estatisticamente significantes na maioria das correlações. **Conclusão:** Os homens em geral apresentaram distúrbios de sono e queda na qualidade de vida, demonstrando a necessidade de um planejamento na assistência, a fim de minimizar os efeitos colaterais do tratamento.

**Palavras-chave:** Enfermagem; Neoplasias da próstata; Transtornos do sono; Qualidade de vida.

## RESUMEN

**Objetivo:** Analizar el sueño y la calidad de vida de hombres con cáncer de próstata sometidos a la terapia hormonal, antes o después de la prostatectomía radical y/o radioterapia. **Métodos:** Estudio transversal y cuantitativo. Fueron entrevistados 50 hombres, entre febrero y mayo de 2012, mediante el *Pittsburgh Sleep Quality Index* (PSQI) y la Organización Europea para la Investigación y Tratamiento del Cáncer (EORTC-QLQ-C30). **Resultados:** Puntuación total de Pittsburgh con media de 8,76, que indica baja calidad del sueño. Sobre las correlaciones entre las dimensiones de EORTC-QLQ-C30, las puntuaciones de sueño se presentaron desde fuerte a moderada para las funciones síntomas y capacidad funcional, siendo estadísticamente significativas en la mayoría de las correlaciones. **Conclusión:** En general, los hombres mostraron trastornos del sueño y disminución de la calidad de vida. Se hace necesaria la planificación en la asistencia para minimizar los efectos secundarios del tratamiento.

**Palabras-clave:** Enfermería; Neoplasias de la próstata; Trastornos del sueño; Calidad de vida.

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## INTRODUCTION

Cancer affects million of people and is one of the main causes of death and illness in the world. Prostate cancer is the second most frequent type of neoplasia among men; there were 1.1 million new cases in 2012. About 70% of the cases occur in developed countries. This large number may be explained by improved screening practices. In Brazil, increased expectancy of life, the improvement and development of diagnostic methods and the quality of information systems, as well as screening practices such as the Prostatic-Specific Antigen (PSA) and rectal examination, have increased incident rates over time. A total of 68,800 new cases are expected for 2014<sup>1</sup>.

Risk factors associated with prostate cancer, especially for more aggressive cancers, contribute to the disease high incidence<sup>1</sup>, such as: family history, race or ethnicity (the disease is more common among Afro-descendants than among Caucasians), a diet rich in beef, sausages and calcium, and obesity.

Even though active surveillance, radical prostatectomy, radiotherapy and hormone therapy<sup>2</sup> are among the possibilities of treatment for prostate cancer, this study specifically addresses hormone therapy because this is a therapeutic option that is possible in any of the disease stages. This is a first-line hormone treatment constituted of analogues, gonadotropin releasing hormone (GnRH), goserelin, leuprolide and triptorelin. Reports of pain are expected during this treatment due to osteoporosis, gynecomastia, hot flashes and impotency, fatigue, and decreased quality of life<sup>2,3</sup>.

Since the second half of the 20<sup>th</sup> century, improved diagnosis and more efficient treatments have enabled the survival of patients. The quality of life of individuals with cancer is frequently addressed in the literature due to the potential impact of each different treatment on the lives of patients<sup>4,5</sup>. Knowledge of factors affecting quality of life is key to identifying, understanding, and developing intervention strategies to prevent a decline in quality of life domains<sup>6</sup>.

Change in sleep patterns related to cancer is one of the most prevalent symptoms affecting patient quality of life. Two studies addressing prostate cancer and sleep patterns and their repercussions for quality of life stand out in the literature. The results of one of the studies indicate that men experienced expressive poor quality of sleep and the second study reports that half of the men experienced insomnia<sup>7,8</sup>.

Evidence found in the literature contributed to the establishment of this study's objective, which was to analyze the sleep patterns and quality of life of men with prostate cancer undergoing hormone therapy prior to or after radical prostatectomy and/or radiotherapy.

## METHOD

This cross-sectional study is an excerpt of a Master's thesis defended for the Master's Program in Health Care at the Federal

University of Triangulo Mineiro (UFTM) titled "Quality of life of men with prostate cancer" approved in October 2011 by the Institutional Review Board at UFTM (Protocol N<sup>o</sup> 2015).

Data were collected in the cancer outpatient clinic of a cancer hospital located in Uberaba, Minas Gerais, Brazil from February to May 2012.

After signing free and informed consent forms, 50 men aged 18 years old or older, with a diagnosis of prostate cancer and undergoing hormone therapy prior to or after radical prostatectomy and/or radiotherapy treatment, were interviewed.

Two standardized instruments were used: the Pittsburgh Sleep Quality Index (PSQI) and the European Organization for Research and Treatment of Cancer (EORTC-QLQ-C30).

The Pittsburgh Sleep Quality Index (PSQI) was validated in Brazil<sup>9</sup> and is used to measure subjective quality of sleep and the occurrence of sleep disorders in the previous month. It may be self-administered or applied as an interview. It is composed of ten questions, the scores of which are totaled. The cut-off point of the overall score is five. Scores above five indicate poor sleep and those below five indicate good quality of sleep<sup>9</sup>.

The European Organization for Research and Treatment of Cancer (EORTC-QLQ-C30) was also validated in Brazil, together with its respective complement for lung cancer, in 2006<sup>10</sup> and is used to address quality of life among cancer patients. It is composed of 30 questions with a scale ranging from 9 to 100 and is divided into three subscales: a Global Health Status Scale (ESG), which assesses general health aspects and quality of life (questions 29 and 30); Functional Scale (FS), which addresses the physical, emotional, cognitive, functional and social domains (questions 1 to 7 and 20 to 27); and the Symptoms Scale (SS) addressing fatigue, pain, insomnia, nausea and other symptoms (questions 8 to 19 and 28)<sup>10</sup>.

After collection, data were coded and inserted into a Microsoft<sup>®</sup> Excel XP<sup>®</sup> spreadsheet and later transferred to the Statistical Package for the Social Sciences<sup>®</sup> (SPSS<sup>®</sup>), Windows XP<sup>®</sup>. An analysis of the relationships between scores and quantitative variables of the instruments was performed together with Person's Correlation text.

## RESULTS

Among the 50 interviewees, 36 (72%) were Caucasian, 35 (70%) were aged from 60 to 79 years old, 30 (60%) were married, and 33 (66%) had from one to five children (Table 1).

The analysis of the medical charts revealed that the tumors of 28 (56%) men were in stages III or IV. Of the participants, 46 (92%) were undergoing or had already undergone radiotherapy, and eight (16%) had undergone radical prostatectomy. In regard to hormone therapy, which all of the men experienced, 34 (68%) were in the first year of treatment, 43 (86%) took the medication monthly. Goserelin was the most frequent treatment for 36 (72%) individuals among those not in metastases, followed by clodronato, 20 (40%) individuals among those with metastasis.

**Table 1.** Distribution of men according to socio-demographic characteristics (n = 50). Uberaba - MG, 2012

Variables		N	%
City of residence	Uberaba	25	50
	Other	25	50
Race	Caucasian	36	72.0
	Non-Caucasian	14	28.0
Age	Up to 59 years old	6	12.0
	60-79 years old	35	70.0
	80+ years old	9	18.0
Marital status	No partner	20	40.0
	With partner	30	60.0
Complete years of formal education	Zero	16	32.0
	1 to 4 years	25	50.0
	5 to 8 years	5	10.0
	9 or more	4	8.0
Current working status	Retired	43	86.0
	On sick leave with government benefits	1	2.0
	Formal employment contract	1	2.0
	No formal employment contract	1	2.0
	Self-employed	4	8.0
Lives with*	Does not apply	10	20.0
	Alone	8	16.0
	Spouse or partner	26	52.0
	Children	22	44.0
	Grandchildren	8	16.0
	Other relatives	6	12.0

\* Categories are not mutually exclusive. Data collected by Izabel Cristina Soares Araujo (2012).

Appropriate internal consistency was observed for the PSQI, with 0.64 for Cronbach's alpha. The PSQI global score with the highest average was 8.76, which indicates poor quality of sleep. Among the components, the one with the highest score, i.e., the one indicating the worst quality of sleep, was "habitual sleep efficiency" with an average of 2.18. On the other hand, the component with the lowest score, i.e., indicating better sleep, was the "use of sleeping medications", with an average of 0.38 (Table 2).

The internal consistency of EORTC-QLQ-C30 was satisfactory and it obtained a Cronbach's alpha of 0.87. The highest score in the domain "functional" presented an average of 78 and the lowest in the "social" domain was 20. The domain "physical function" obtained an average of 58.95. In the domain "symptoms" of EORTC-QLQ-C30; the subdomain with the third worst quality was insomnia with an average of 31.78 and the subdomains with no negative impact on the quality of life of men were diarrhea, with an average of 9.24, followed by nausea and vomiting with an average of 9.33 (Table 3).

Correlations among the EORTC-QLQ-C30 and sleep components in the functional domain were strong-to-moderate and statistically significant. The higher the scores obtained in the sleep components, the lower the domains of functions, negatively impacting quality of life. In the domains of symptoms, the correlations were strong-to-moderate, meaning that the higher the scores of the sleep components, the more frequent the symptoms, indicating a worse quality of life.

## DISCUSSION

So far, age is the risk factor best identified for the development of prostate cancer. A total of 62% of prostate cancer occurrences in the world are diagnosed for men 60 years old or older<sup>1</sup>. Likewise, this study's participants were aged from 60 to 79 years old (70%). Studies from different countries also report that the average age of men with prostate cancer undergoing hormone therapy was above the age of 60<sup>9-11</sup>.

**Table 2.** Measures of location and variability for the sleep components. Uberaba - MG, 2012

PSQI	Min.	Max.	Average	Median	Standard deviation
Subjective quality of sleep	1	3	1.28	1.00	0.54
Sleep latency	0	3	1.00	1.00	1.05
Duration of sleep	0	3	1.72	2.00	0.97
Habitual sleep efficiency	0	3	2.18	3.00	1.08
Sleep disorders	0	2	1.42	1.00	0.54
Use of medication to sleep	0	3	0.38	0.00	0.99
Daytime dysfunction	0	3	0.78	1.00	0.81
PSQI's global score	2	18	8.76	9.00	3.13

Data collected by Izabel Cristina Soares Araujo (2012).

**Table 3.** Measures of location and variability for the domains of quality of life - Uberaba - MG, 2012

EORTC-QLQ-C30	Min.	Max.	Average	Median	Standard deviation
General Health Status (EGS)	25	100	60.33	66.66	17.62
*Physical Function (FF)	0	100	58.95	60.00	28.00
*Role performance (DP)	0	100	62.48	67.00	34.56
*Emotional Function (FE)	0	100	65.74	75.00	30.51
*Cognitive Function (FC)	0	100	68.92	67.00	28.57
*Social Function (FS)	0	100	78.20	92.00	28.35
*Fatigue (FAD)	0	100	36.00	22.22	30.33
**Nausea and vomiting (NAV)	0	100	9.33	0.00	21.60
**PAIN	0	100	33.65	33.33	3.58
**Dyspnea (DIS)	0	100	12.56	0.00	24.92
**Insomnia (INS)	0	100	31.78	33.00	35.45
**Loss of Appetite (PAP)	0	100	21.24	0.00	36.63
**Constipation (CON)	0	100	23.80	0.00	29.95
**Diarrhea (DIA)	0	66	9.24	0.00	17.69
**Financial hardship (DIF)	0	100	27.82	0.0	35.71

\* Domains of functions; \*\* Domains of symptoms. Data collected by Izabel Cristina Soares Araujo and Elizabeth Barichello (2012).

American studies addressing men with prostate cancer undergoing hormone therapy and/or radiotherapy also show the prevalence of the disease among Caucasians in comparison to Afro-descendent individuals<sup>9-11</sup>. Statistical analysis, however, confirms that prostate cancer is approximately 1.6 times more common among Afro-descendants than among Caucasians and susceptibility can be attributed to heredity from the fact that Americans, Jamaicans, and Caribbean individuals of Afro-descendant presented the highest rates of this type of cancer around the world<sup>1</sup>. It is important to note there is miscegenation both in Brazil and in American Caucasian and Afro-American men, which could explain, at least in part, the prevalence of the disease among the self-reported Caucasian population.

The high number of men with a partner (60%) is in agreement with Brazilian studies addressing cancer in general for

both sexes<sup>12,13</sup>. Similar results are found in studies conducted in other countries addressing prostate cancer, with a prevalence among married men<sup>11,14</sup>.

The tumors of 56% of this study's participants were in the stages III or IV, i.e., advanced stages of the disease. A study conducted in Canada assessed 861 men with prostate cancer who did not undergo hormone therapy but were treated with radiotherapy, brachytherapy or prostatectomy, reporting that 99 men were in stage II and 319 in stage III<sup>15</sup>.

Different results were found in an international study addressing 475 men with prostate cancer who did not undergo hormone therapy. The results were distributed into groups who had undergone radiotherapy brachytherapy or prostatectomy surgery. It reports that the disease of 216 of the men was in stage I<sup>5</sup>. In regard to staging, the tumor may be classified as

stage I, II, III, or IV. The earlier the disease is diagnosed, e.g., in the first stages, the higher the chances of survival and the need for a less invasive treatment.

In regard to quality of life, sleep is essential to people's quality of life and studies report that sleep disorders impact the lives of individuals with neoplasia<sup>13</sup>. The results of the questionnaires show that the PSQI's global score obtained in this study were 8.76 on average, which indicates poor quality of sleep. There is, therefore, potential for a negative impact on the lives of patients.

One Brazilian study addressing 140 elderly individuals with cancer of the digestive tract, breasts, or with gynecological cancer show that 62% of the individuals experienced sleep disorders<sup>13</sup>. Note that most of the individuals addressed in this study were men older than 60 years old and who also experienced sleep disorders.

Additionally, a study addressing 60 men with prostate cancer receiving hormone therapy verified that these individuals experienced problems both falling to sleep and during sleep, with an average score of 2.7 for nighttime awakenings<sup>16</sup>. Additionally, studies conducted in other countries addressing men with prostate cancer report that these patients experience poor sleep<sup>7,17,18</sup>. These studies corroborate our findings and most of them used the PSQI.

Given this context, one north american study investigated sleep disorders and quality of life for 861 men with prostate cancer undergoing radiotherapy (tele- and/or brachytherapy) or radical prostatectomy surgery reports that those who initially received radiotherapy experienced higher levels of depression, fatigue, insomnia, and a worse quality of life<sup>15</sup>.

## CONCLUSION

This study used instruments to analyze the sleep and quality of life of men with prostate cancer who have undergone hormone therapy and found that these patients experienced poor quality of sleep and poor quality of life.

The studied male population was characterized by a predominance of Caucasians aged between 60 and 79 years old, married, retired and with a partner. The analysis of clinical data showed that more than half of the individuals had tumors classified as stage III or IV, most were in the first year of their hormone therapy and had undergone or were undergoing radiotherapy.

This was a cross-sectional study, which limited the assessment of how quality of life and sleep patterns progressed over time.

The possibility, however, of nursing professionals using instruments to assess sleep disorders and quality of life can lead to the early treatment of symptoms whenever alterations are verified. Additionally, gaps in this study can be further investigated in the

nursing field, enabling greater quality of care to be provided to these individuals.

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