Relationship between Sleep Quality and Anxiety-Depressive Disorders in Moroccan Women with Breast Cancer: A Cross-Sectional Study

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Abstract

Background: Breast cancer is the most common female cancer in the world. Sleep disruption is one of the major problems of breast cancer patients. This study aimed to evaluate the quality of sleep in a group of Moroccan women with breast cancer and analyze the association between sleep quality, depression, and anxiety.

Methods: This cross-sectional study was carried out among 337 Moroccan women treated for breast cancer at the Mohammed VI Cancer Treatment Center in Casablanca in 2019. A questionnaire was designed for this purpose based on two scales: Pittsburgh Sleep Quality Index (PSQI) and Hospital Anxiety Depression Scale (HADS).

Results: 71.5% of the participants had significant sleep disturbances; the subjective quality of patients' sleep was considered to be quite poor (20.8%) and 43.9% of participants need more than 60 minutes to fall asleep. The average sleep duration was 6.16 h/night and 84.3% of patients had not taken sleep medicines in the last month. The most common reasons for sleep disturbances were getting up to use the bathroom (67.4%) and waking up in the middle of the night or early morning (54%). Anxiety and depression were positively correlated with PSQI scores.

Conclusion: The present study highlights how much breast cancer patients are vulnerable to psychological disorders and then incites the decision makers in oncology departments to implement rigorous psychological health care strategies in order to ameliorate mental health and sleep quality of breast cancer patients.

Keywords: Breast cancer; Sleep quality; Anxiety; Depression; Associated factors

Introduction

Breast cancer is the most frequently diagnosed type of cancer in the vast majority of countries around the world with an incidence of 2.1 million new cases in women in 2018, representing almost

1 in 4 cancer cases in women. This type of cancer is also the leading cause of cancer death in women in more than 100 countries (1). In Morocco, like many other lower-middle-income countries, breast cancer is a major public health problem. According to data from the Greater Casablanca Cancer Registry of 2012, breast cancer is the first common cancer among women in Morocco (2).

During the treatment trajectory, cancer patients experience physical and psychological distress (3). One of the main complaints in cancer patients is sleep disturbances. Sleep problems were found in 30%-75% of newly diagnosed or recently treated cancer patients. This rate is quite high and double what is recorded in the general population (4). Therefore, the major sleep issues largely described in cancer patients were insomnia (31%) and excessive sleepiness (28%). The highest prevalence was found in those with breast cancer and among its indicators were fatigue, restless legs, fears, and recent cancer surgery (5). Likewise, another study suggests a positive association between depression and sleep disturbances in breast cancer patients, the depressive symptoms were found in 56% of the patients (6). In addition, patients with advanced cancer revealed an association between quality of sleep and hopelessness (7).

Very few Moroccan studies have evaluated the quality of sleep in patients with cancer. Indeed, the present study mainly aims to assess firstly the quality of sleep in a group of Moroccan women with breast cancer and secondary to analyze the association between sleep disorders, socio-demographic characteristics as well as anxiety and depressive disorders.

Methods

Participants and procedures

We conducted a descriptive cross-sectional study in the oncology department of the Ibn Rochd University Hospital Center (IRUHC) of Casablanca over a period of ten months from 01/02/2019 to 01/11/2019. The sample included 337 patients with histologically confirmed breast cancer. Patients who were older than 22 yr of age and who had the ability to communicate effectively with study staff with knowledge of the disease diagnosis were included. Patients with a history of psychiatric disorders, drug abuse, cancer metastases or mental disorders that could affect the comprehension of the questionnaires were excluded.

Finally, all patients were informed of the nature of the study, and if they were willing to participate, they were asked to provide prior written consent (for illiterate patients, verbal consent followed by a fingerprint was used as proof of consent). We gave these patients a questionnaire and two scales in an interview. We used a validated version translated into dialectal Arabic. Patients took between five and ten minutes to complete it. The questionnaire focused on socio-demographic characteristics.

Pittsburgh Sleep Quality Index

The first scale used was the Pittsburgh Sleep Quality Index (PSQI) (8,9), it evaluates subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The PSQI consists of 19 self-assessment questions and 5 questions asked by the bed partner or roommate. In addition, it can be applied to all types and stages of cancer and all therapeutic situations. Only self-assessment questions are included in the score. The 19 self-assessment questions combine to give seven "components" of the overall score, with each component receiving a score from 0 to 3. In all cases, a score of zero indicates no difficulty, while a score of 3 indicates severe difficulty. The 7 components of the score add up to give an overall score ranging from 0 to 21 points, with 0 indicating no difficulty and 21 indicating major difficulties. The threshold value to differentiate good sleepers and bad sleepers is eight. Patients with a PSQI greater than 8 are considered as poor sleepers.

Hospital Anxiety and Depression Scale

The second scale was the Hospital Anxiety Depression Scale (HADS) by Zigmond and Snaith

(1983), used to identify and evaluate anxiety and depression in a population and to assess the severity of these disorders. It is composed of two 7-item subscales, one for anxiety and one for depression. The sum of each subscale identifies patients with depressive or anxiety symptoms on three levels: 1) 0 to 7: no anxiety or depressive disorders, 2) 8 to 10: suspected anxiety or depressive disorders, and 3) 11 to 21: known anxiety or depressive disorders. The sum of the overall score identifies patients with anxiety depressive syndromes on two levels: 1) from 0 to 14: no anxio-depressive disorders and 2) from 15 to 42: existence of anxio-depressive disorders (10) (11).

Ethical considerations

The present study was conducted in a framework that respects the ethics and dignity of participants. Ethical approval was obtained from the Moroccan Association for Research and Ethics, Research Ethics Committee, (N° 02/REC/20). All procedures performed in this work involving patients were in accordance with the ethical standards of the institutional and/or national research committee. Confidentiality and anonymity criteria were met as charted by the declaration of Helsinki and its later amendments. Informed consent was obtained from all participants included in this study.

Statistical analyses

Descriptive statistics were performed to describe the following: socio-demographic, medical characteristics of patients, sleep quality, and anxiety and depression scores. Percentage comparisons were made using Pearson's Chi2 test. All *P*-values equal to or less than 0.05 were considered statistically significant. The statistical analysis was carried out using the SPSS ver. 20.0 (IBM Corp., Armonk, NY, USA) software.

Results

The mean age of the patients was 49.72 yr with extremes ranging from 22 to 82 yr. 39.76% were married, 51.63% of the patients were illiterate, 64.39% had a low socio-economic level and 7.42% had a professional activity. Concerning medical coverage, the vast majority of patients (92.58%) had RAMED, which allows patients to access health services. The minority of patients (27.6%) live in rural areas (Table 1).

Table 1: Socio-demographic characteristics

Patient characteristics	Values
Age in years [mean (range)]:	49.72 (22-82)
Family status [n (%)]:	
Married	134 (39.76%)
Single + Divorced + Widow	203 (60.24%)
Working status :	
▪ Active woman	25 (7.42%)
▪ Active spouses	103 (76.3%)
Education level :	
▪ For the woman	174 (51.63 %)
• Illiterate	84 (24.93 %)
• Primary	79 (23.44 %)
• Secondary + High	
▪ for the spouse	
• Illiterate	80 (59.26 %)
• Primary	25 (18.52 %)

• secondary + High	30 (22.22 %)
Residency :	
• Rural	93 (27.6 %)
• Urban	244 (72.4 %)
Economic status :	
• Poor	217 (64.39 %)
• Good	120 (35.61 %)
Medical coverage system:	
▪ CNSS + CNOPS	25 (7.42 %)
▪ RAMED	312 (92.58 %)

Table 2 shows that the mean value of the PSQI was 10.04 with a standard deviation of 4.01. Concerning the prevalence of anxiety, the results of the HADS score (A): 13.35 with a standard deviation of 3.97 indicate that the majority of patients suffer from proven anxiety. In addition, the mean HADS value (D) was 11.50 with a standard deviation of 4.44, indicating that depression is also present. The overall score: 24.88 shows the existence of anxiety and depressive disorders in cancer patients.

Table 2: Descriptive data for sleep quality, anxiety and depression scores

Variables	*Mean*	*S.D.*	*Minimum*	*Maximum*
Subjective sleep quality	1.83	1.021	0	3
Sleep latency	1.94	1.110	0	3
Sleep duration	1.43	1.176	0	3
Habitual sleep efficiency	0.94	1.086	0	3
Sleep disturbances	1.62	0.636	0	3
Use of sleeping medication	0.36	0.885	0	3
Daytime dysfunction	1.91	0.910	0	3
PSQI	10.04	4.010	1	21
Depression (HADS-D)	11.50	4.443	0	21
Anxiety (HADS-A)	13.35	3.977	2	21
Anxiety and Depression (HADS-T)	24.88	7.671	4	42

Evaluation of the PSQI component scores showed that the subjective quality of patients' sleep was considered to be quite poor (20.8%) or very poor (35.6%), 32.3% of participants need 31 to 60 min to fall asleep, and 43.9% fell asleep after more than 60 min. The average sleep duration was 6.16 h/night, 26.1% slept less than 5 hours per day, and 21.7% slept between 5 and 6 hours per day. 84.3% of patients did not take sleep medicines in the last month. In this study, 55.8% of participants suffered from sleep disturbances, and the most common reasons for sleep disturbances was having to get up to use the bathroom (67.4%) and waking up in the middle of the night or early morning (54%). In addition, 30.9% of the target population suffer from a very poor state of well-being during the day, with (36.2%) stating that their well-being during the

day is quite poor. According to a threshold value of eight on the PSQI, 71.5% of breast cancer women were considered as poor sleepers.

As shown in Table 3, there is a significant correlation between marital status and sleep disturb-ance (P=.001), also between socio-economic level and sleep disturbance (P=.003), while there is no significance between other factors and sleep disturbance.

Table 3: Association between the PSQI total scores and socio-demographic characteristics

Variables		*PSQI total score*			
		N	Mean	S.D	*P*
Age intervals (yr):	<35	28	8.29	3.568	0.053
	35-49	162	10.17	3.933	
	>50	147	10.23	4.117	
Family status:					
Married		134	9.17	3.132	
Single + Divorced + Widow		203	10.61	4.411	0.001*
Working status:					0.30
▪ Active women		25	9.24	4.055	0.53
▪ Active spouses		103	9.27	3.052	
Education levels:					
▪ For the women					
● Illiterate		174	10.16	4.151	0.06
● Primary		84	10.61	4.095	
● Secondary + High		79	9.16	3.469	
					0.48
▪ For the spouse					
● Illiterate		80	8.91	3.115	
● Primary		25	9.72	2.923	
● Secondary + High		30	9.43	3.319	
Residency:					
● Rural		93	9.99	4.213	0.89
● Urban		244	10.06	3.938	
Economic status :					
● Poor		217	10.52	4.169	
● Good		120	9.18	3.561	0.003*
Medical coverage system:					
▪ CNSS + CNOPS		25	9.60	3.979	0.57
▪ RAMED		312	10.07	4.017	

*P<0.05

Table 4 shows the relationship between PSQI components, depression, anxiety, and anxiety-depressive syndromes. Statistically significant associations were found between the PSQI total score and the HADS components, and most of the PSQI components were strongly correlated with the assessed variables.

Table 4: Correlation between the PSQI (components and total score) and the HADS components (HADS-D, HADS-A, HADS-T)

Characteristics		HADS-D			HADS-A				HADS-T		
		N	Mean ± SD	P	N	Mean ± SD	P		N	Mean ± SD	P
Subjective sleep quality	0-7	71	1.18 ± .946	.001**	37	.86 ± .948	.001**	0-14	40	.83 ± .813	.001**
	8-10	60	1.70 ± .979		37	1.49 ± .731		15-42	297	1.96 ± .970	
	11-21	206	2.09 ± .954		263	2.01 ± .979					
Sleep latency	0-7	71	1.46 ± 1.132	.001**	37	1.35 ± 1.136	.001**	0-14	40	1.20 ± 1.043	.001**
	8-10	60	1.68 ± 1.066		37	1.43 ± 1.068		15-42	297	2.04 ± 1.082	
	11-21	206	2.17 ± 1.015		263	2.10 ± 1.065					
Sleep duration	0-7	71	1.30 ± 1.126	.004*	37	1.03 ± 1.093	.076	0-14	40	1.08 ± 1.095	.040*
	8-10	60	1.05 ± 1.032		37	1.41 ± 1.040		15-42	297	1.48 ± 1.180	
	11-21	206	1.59 ± 1.205		263	1.49 ± 1.198					
Habitual sleep efficiency	0-7	71	.82 ± 1.004	.005*	37	.70 ± .909	.292	0-14	40	.73 ± .960	.175
	8-10	60	.60 ± .906		37	.86 ± 1.110		15-42	297	.97 ± 1.099	
	11-21	206	1.09 ± 1.136		263	.99 ± 1.103					
Sleep disturbances	0-7	70	1.34 ± .587	.001**	37	1.35 ± .676	.001**	0-14	40	1.25 ± .630	.001**
	8-10	60	1.65 ± .633		37	1.35 ± .538		15-42	297	1.67 ± .621	
	11-21	206	1.70 ± .630		263	1.69 ± .625					
Use of sleeping medication	0-7	71	.25 ± .670	.485	37	.30 ± .812	.511	0-14	40	.35 ± .834	.963
	8-10	60	.43 ± .963		37	.22 ± .630		15-42	297	.36 ± .893	
	11-21	206	.37 ± .926		263	.38 ± .925					
Daytime dysfunction	0-7	71	1.54 ± .876	.001**	37	1.38 ± .794	.001**	0-14	40	1.40 ± .744	.001**
	8-10	60	1.92 ±		37	1.65 ±		15-42	297	1.98	
	11-21	206			263						

Variable	Category	N	Mean ± SD	P	N	Mean ± SD	P	Category	N	Mean ± SD	P
			2.04 ± .944 … ± .880			2.03 ± .949 … ± .888				± .910	
PSQI	0-7	71	7.90 ± 3.104	.001**	37	6.97 ± 3.346	.001**	0-14	40	6.83 ± 2.934	.001**
	8-10	60	9.00 ± 3.390		37	8.41 ± 2.630		15-42	297	10.47 ± 3.941	
	11-21	206	11.08 ± 4.096		263	10.70 ± 3.999					

*P<0.05, **P<0.001

Subjective Sleep Quality is highly correlated with the variables assessed. Moreover, Sleep duration is correlated with depression and anxiety-depressive syndromes. However, there was no significant correlation between use of sleeping medication and the HADS components.

Discussion

To our knowledge, this is the first Moroccan study assessing the relationship between sleep quality impairment and anxiety-depressive disorders in breast cancer patients. The examination of the overall sleep quality revealed that the majority of patients had scores at or above the threshold of 8. This finding is similar to those described in the literature and indicating a significant decrease in sleep quality (12).

In many studies, poor sleep quality was described in elderly patients (13). According to our study, there was no statistically significant difference between the PSQI and age, which is consistent with the work of Dogan et al (14). However, a noticeable difference was revealed between mean PSQI scores and family status; thus, the highest mean scores were found in the single, widowed and divorced groups. Data are in line with those published by Dogan et al (14).

The mean PSQI score of the patients was examined according to education level, with the highest mean score was found among the illiterate group, but the difference between the groups was not statistically significant, these findings are in agreement with other recent study (14).

Our results showed also that 55.8% of cancer subjects complained about sleep disturbances. In addition, the PSQI components revealed that 76.2% of participants reported that sleep latency was greater than 30 min, 47.8% reported that sleep duration was less than 6 hours, 43.38% had usual sleep efficiency less than 85%, and 56.4% of the respondents described the quality of their sleep as fairly or very poor. However, despite the high prevalence of sleep disorders in the population, the majority (84.3%) did not use sleep medications. These results are consistent with another study at INO Rabat, where 48% of patients exhibited sleep disorders (15).

In Chicago, using the Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality in 72 breast cancer patients, 61% of samples had a significant sleep deficit, 40% reported sleep latency greater than 15 min, 36% of patients reported sleeping less than 6 hours, 46% of patients had usual sleep efficiency scores of less than 85%, and 29% described their sleep quality as fairly or very poor (16).

One of the most common factors affecting the sleep quality among our target population was getting up to use the bathroom (67.4%) and waking up in the middle of the night or early morning (54%). This finding is in line with previous study (12).

Regarding the relationship between PSQI components and depression, subjective sleep quality was strongly associated with depression (*P*<0.001) and this is consistent with another work (12). In concordance with our findings, a

recent study conducted on 266 breast cancer survivors in South Korea found that alteration of subjective quality of sleep induced depression (17). Furthermore, a higher correlation was found between sleep latency and depression, this finding is consistent with the conclusions of Mystakidou et al (12).

Our results show a significant correlation between anxiety and sleep disorders, which is consistent with the work of Redeker et al, who confirmed that anxiety is positively correlated with sleep disorders (18).

In addition, our study shows that the correlation between depression and sleep disorders is highly significant ($P<0.001$). In line with these findings, a study conducted on women with breast cancer before surgery found a significantly positive correlation between depression and poor sleep quality in these patients (19).

Regarding the anxiety-depressive syndrome, the majority of participants (86.67%) suffer from anxiety and depressive disorders. The prevalence of anxiety and depressive disorders is high in women with breast cancer (20,21).

This study has certain limitations. On the one hand, the sample recruited from a single hospital center cannot represent the general population of Moroccan women with breast cancer. On the other hand, the study adopted is of the transversal one, the results obtained must be confirmed by a longitudinal study.

Conclusion

Overall, patients suffering from breast cancer are a potential target for sleep disturbances, anxiety and depression leading together to poor quality of life. The implementation of a dedicated and permanent psychological care besides the therapeutic one is highly requested within the oncology departments. Such strategy could affect positively the quality of life of patients and prolonging their life expectancy.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Conflict of interest

The authors declare that there is no conflict of interests.

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