



ASSESSMENT OF SLEEP QUALITY AND ITS ASSOCIATION WITH BEHAVIORAL AND CLINICAL CHARACTERISTICS AMONG CANCER PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL IN JAMMU, UT OF J&K, INDIA

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ABSTRACT

Background: Sleep disturbances significantly impact the quality of life for cancer patients. This cross-sectional study aimed to estimate the prevalence of poor sleep quality and its association with various factors among cancer patients in Jammu, UT of J&K.

Methods: 350 cancer patients attending radiotherapy/radiation oncology departments were enrolled from August 2023 to July 2024 using a consecutive sampling method. Data on socio-demographic, behavioural, and clinical characteristics and sleep quality (Pittsburgh Sleep Quality Index) were collected. Chi-square tests were used for statistical analysis.

Results: The prevalence of poor sleep quality was 89.4%. The results revealed that poor sleep quality was significantly associated with advanced cancer stages and metastasis ($p < 0.05$). Factors like time since diagnosis and time between diagnosis and treatment were also significantly associated ($p < 0.05$).

Conclusion: This study, the first in the region, revealed a high prevalence of poor sleep among cancer patients, linked to advanced disease. It underscores the need for improved healthcare access, enhanced community education, and targeted interventions for sleep hygiene. Regular sleep assessments and strengthening support networks are crucial for enhancing patient outcomes.

Keywords: Sleep quality, Prevalence, Behavioural factors, Clinical characteristics, Cancer patients

INTRODUCTION

In 2022, around 20 million new cancer cases and 9.7 million deaths were reported (WHO fact sheet) [1]. Breast cancer is the most prevalent cancer, with several annual cases around 287,850 in 2022, while lung cancer is the leading cause of death in cancer, with 350 deaths per day in developed countries. In India, breast, lung, mouth, cervix uteri, and tongue are the five leading cancers (GLOBOCAN statistics 2022) [2]. Sleep disturbance is one of the most common and distressing symptoms that affects the quality of life among cancer patients. Poor sleep quality may be defined as the inability to initiate and maintain sleep frequency, frequent awakening, and a feeling of unrest

(National Sleep Foundation, 2020) [3]. As per estimates, around 20% to 78% of cancer patients have poor sleep quality globally, while in India, 57.6% of cancer patients have poor sleep quality (Pai A. et al.) [4]. Various research shows that age, gender, education, marital status, and low income among cancer patients can affect sleep quality. Review of literature also reveals that the type of cancer, type of treatment, and duration of treatment among cancer patients can affect the sleep quality. Sleep habits, smoking habits, average daily coffee consumption, and alcohol consumption can affect sleep quality. Long-term use of chemotherapeutic drugs also leads to sleep disturbance. During the review of literature, it was found that though some research has been conducted on sleep quality, behavioural characteristics, and clinical characteristics in the developed world, there is a paucity of literature in developing countries like India. So, it was in this context that this study was planned among cancer patients in a tertiary care teaching hospital in the Jammu district of UT of Jammu and Kashmir. The study aimed to estimate the prevalence of sleep quality and to assess the association of socio-demographic, behavioural characteristics and clinical characteristics with sleep quality among cancer patients

MATERIAL AND METHODS

This study was conducted from August 2023 to July 2024 in a tertiary care hospital in Jammu. All the patients who were diagnosed as confirmed cases of cancer during this period comprised the study population.

Inclusion Criteria: Those who were willing to participate; those with an age of 18 years and above, having a pathologically confirmed cancer diagnosis and receiving any type of cancer treatment.

Exclusion Criteria: Those who were not willing to participate; those with some medical condition such that they are unable to respond to questions, and those who were on treatment for some psychiatric illness.

Sampling and sample size: Consecutive sampling was the method used, and 30 patients were interviewed every month. Thus, a total of 350 patients were enrolled in the study period. Informed written consent was duly obtained. IEC approval was obtained before commencement of the study (IEC/GMC/2023/1373 Dated: 17/07/2023). Data collection tools included:

I. Socio-demographic details and behavioural characteristics of all the patients were inquired about with the help of a pretested questionnaire. Alcohol intake, coffee and tea drinking, tobacco use, etc. and clinical characteristics like type of cancer, stage of cancer, treatment type, distant metastasis, co-morbid disease, and time since diagnosis were also recorded using a pretested questionnaire. It was followed by the recording of BMI.

II. The Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep quality over a 1-month time interval. Poor sleep quality was defined as a global Pittsburgh Sleep Quality Index (PSQI) score >5 , whereas a global score ≤ 5 indicated good sleep quality, in accordance with the original and most widely accepted cutoff established by Buysse et al. (1989).

All the data collected during the course of the study were entered into a Microsoft Excel sheet. The qualitative data were tabulated as frequencies and proportions, while the quantitative data were presented as means and standard deviations. The test of significance used was the chi-square test, and a p-value < 0.05 was considered statistically significant

Ethical Statement: This study involving human participants was conducted in accordance with ethical standards and was approved by the Institutional Ethics Committee (IEC) of Government Medical College (GMC) Jammu (IEC/GMC/2023/1373, Dated: 17/07/2023). Approval was obtained from the IEC before the commencement of the study. Informed consent was obtained from all individual participants included in the study, and the researchers documented this process. Informed consent was approved by the Institutional Ethics Committee (IEC) of Government Medical College (GMC) Jammu. The consent process was thoroughly explained to each participant, ensuring they understood the study's purpose, procedures, potential risks and benefits, and their right to withdraw at any time.

RESULTS

A total of 350 cancer patients were enrolled. The prevalence of poor sleep quality (PSQI >5) was 89.4% (313/350). Males comprised 50.3% (176) and females 49.7% (174); 74.6% were from rural areas.

Socio-demographic associations

Poor sleep quality was more common among patients aged >50 years, rural residents, married individuals, those from the upper-middle socioeconomic class, and the uneducated. However, no socio-demographic factor showed a statistically significant association with sleep quality ($p > 0.05$ for all, Table 1).

Table 1: Association of socio-demographic variables with sleep quality of cancer patients (n=350)

Socio-demographic characteristic	Good sleep quality	Poor sleep quality	Total	Chi-Square	p value
Age					
18-30	0(0%)	13(100%)	13(100%)	3.15	0.533
31-49	8(8.16%)	92(92%)	100(100%)		
>50	28(11.8%)	209(88.2%)	237(100%)		
Gender					
Male	19(10.8%)	157(89.2%)	176 (100%)	0.019	0.891
Female	18(10.3%)	156(89.7%)	174 (100%)		
Residence					
Urban	6 (6.7%)	83 (93.3)	89 (100%)	1.85	0.174
Rural	31 (11.9%)	230 (81.1%)	261 (100%)		
Marital Status					
Married	34 (11.2%)	270 (88.8%)	304 (100%)	1.49	0.69
Single	0(0%)	7(7%)	7(100%)		
Widowed/widower/divorced	3(7.69%)	36(92.3%)	39(100%)		
Occupation					
Employed	2(6.3%)	30(93.8%)	32(100.0%)	6.22	0.286
Housewife	7(7.0%)	93 (93.0%)	100(100.0%)		
Others	19(11.0%)	153(89.0%)	172 (100.0%)		
Retired	2(22.2%)	7(77.8%)	9(100.0%)		

Student	1(25.0%)	3(75.0%)	4(100.0%)		
Unemployed	6(18.2%)	27(81.8%)	33(100.0%)		
Socio-Economic Status (as per Modified BG Prasad Scale 2022)					
Middle (2544-4239)	0 (0%)	9(100%)	9(100%)	3.464	0.18
Upper Class (8480 and above)	11(15.9 %)	58(84.1%)	69(100%)		
Upper Middle (4240-8479)	26(9.6%)	246(90.4%)	272(100%)		
Religion					
Hindu	25 (9.8%)	229(90.2%)	254(100%)	0.59	0.743
Muslim	11(12.8 %)	75(87.2%)	86(100%)		
Sikh	1(10%)	9(90%)	10(100%)		
Education					
Educated	21(11.6 %)	161(89.4%)	180(100%)	2.12	0.548
Uneducated	18(10.6 %)	152(89.4%)	170(100%)		

Poor sleep quality was found to be higher among the age group > 50 years; participants resided in a rural area, were married, upper middle class, and uneducated, and no significant association was found between sleep quality and socio-demographic factors

Table 2: Association of behavioural characteristics with sleep quality of cancer patients

Never smoked	28 (9.4%)	271 (90.6 %)	299 (100%)		
Behavioral characteristic	Good Sleep Quality	Poor Sleep Quality	Total	Chi Square	P-value
Coffee /Tea drinking					
Daily	30(10.9%)	245(89.1%)	275 (100%)	0.45	0.798
Never	2(6.9%)	27(93.1%)	29(100%)		
Occasionally	5(10.9%)	41(89.1%)	46(100%)		
Smoking Tobacco: cigarette, cigar, pipe, hookah					
Current smoker	1(6.7%)	14(93.3%)	15 (100%)	4.38	0.11

Former smoker	9(6.6%)	127(93.4%)	136 (100%)		
Never smoked	27(13.6%)	172(86.4%)	199 (100%)		
Alcohol use status					
Current user	1 (50%)	1 (50%)	2 (100%)	3.58	0.17
Former user	3 (7.9%)	35 (92.1%)	38 (100%)		
Never user	33(10.6%)	277(89.4%)	350(100%)		
Smokeless Tobacco: betal nut, gutkha, khaini, snuff mashiri					
Current smoker	1 (11.1%)	8 (88.9%)	9 (100.0%)	3.66	0.16
Former smoker	8 (19%)	34 (81%)	42 (100%)		

Most patients were daily tea/coffee drinkers (78.6%), never used alcohol (88.6%), and never used smokeless tobacco (85.4%). None of the behavioral factors (coffee/tea, smoking, alcohol, smokeless tobacco) showed a significant association with sleep quality ($p > 0.05$, Table 2).

Table 3: Association of clinical characteristics with sleep quality of cancer patients

Type of cancer					
Breast cancer	5 (17.9%)	23 (82.1%)	28(100%)	3.74	0.588
Cancer of GIT	9(12.5%)	63(87.5%)	72(100%)		
Gynecological Cancer	4(10.5%)	33(89.2%)	37(100%)		
Lymphoma	2(11.8%)	15(88.2%)	17(100%)		
Ca of skin, bone and soft tissues	0(0%)	13(100%)	13(100%)		
Others	17(9.3%)	166(90.7%)	183(100%)		
Treatment Type					
Chemotherapy	33(10.4%)	285(89.5%)	318(100%)	0.345	0.845
Surgery + Chemotherapy	3(14.3%)	18(85.7%)	21(100%)		
Others	1(9.1%)	10(90.9%)	11(100%)		
Distant metastasis					
No	16(16.3%)	82(83.7%)	98 (100%)	4.77	0.029
Yes	21(8.3%)	231(91.7%)	252 (100%)		
Stage of cancer					
Stage 1	2(14.3%)	12(85.7%)	14(100%)	13.92	0.003
Stage 2	8(11.6%)	60(88.2%)	68(100%)		

Stage 3	6(37.5%)	10(62.5%)	16(100%)		
Stage 4	21(8.3%)	231(91.7%)	252(100%)		
Time since diagnosis					
≤ 6 months	14(5.5%)	242(94.5%)	256(100%)	26.2	0.000
>6 months	23(24.5%)	71(75.5%)	94(100%)		
The duration of time between diagnosis and treatment (days)					
≤ 28 days	23(24.5%)	71(75.5%)	94(100%)	26.2	0.000
>28 days	14(5.5%)	242(94.5%)	256(100%)		
Co-morbid disease					
Absent	25(11.4%)	194(88.6%)	219(100%)	0.441	0.507
Present	12(9.2%)	119(90.8%)	131(100%)		

No distinct metastasis, stages of cancer, time since diagnosis and time duration between diagnosis and treatment were significantly associated with sleep quality($p<0.05$)

DISCUSSION

The present study estimated the prevalence of sleep quality and associated factors among cancer patients in a tertiary care teaching hospital. The prevalence of poor sleep quality was 89.4%, and 10.6% of cancer patients had good sleep quality.

The mean age of the respondents in the present study was 55.4 years, and this finding is in agreement with the results reported by Pham et al. However, a lower mean age was reported by Endershaw et al. [5] and Echchikkiy et al. [6], while a higher mean age was reported by Belloumi N. et al. [7] and Santoso A. M. et al. [8] It is understandable that with increasing age, the risk of cancer rises due to accumulated cellular damage. The results of the present study have further revealed that the disease was equally distributed among both sexes, and these findings are in contradiction to those reported by Momayyeiz et al. [9]. More than 85% of the respondents were found to be non-alcoholic and never used smokeless tobacco, and these findings are congruent with those noted by Abede E. et al. [10] Furthermore, 57% of the respondents had never smoked tobacco, and these results could partially be due to the social desirability effect among the respondents.

It was found that 72% of the respondents had stage IV cancer, with 61% showing distinct metastases, and these findings align with the results of Pham AT et al. [11] and Pai A et al. [4]. The late presentation among the respondents could be due to the majority of them belonging to rural areas and being uneducated. Limited access to health care facilities in rural areas is among the reasons for delayed cancer diagnosis among the respondents in the present study. About 90% of the respondents had poor sleep quality, and these results are much higher than those reported by Endeshaw et al. [5], where 71.4% of respondents had poor quality of sleep. Pai A et al. [3] reported a 57.6% prevalence of poor sleep quality, whereas Rajendran D et al. [12] underlined a 61.67% prevalence of poor sleep quality in breast cancer survivors in Chennai. Similarly, Jakobsen G. et al. [13], Wang J. et al. [14], Şanlıer NT et al. [15], Narayanan S. et al. [16], and Ishfaq H. et al. [17] reported a lower prevalence of poor sleep quality as compared to the results of the current study. These different results are likely due to different age groups and cancer studies, besides the use of different scales for sleep quality.

The results further revealed a significant association of sleep quality with distinct metastasis and stage of cancer, and these findings were in consonance with those reported by Endeshaw D et al. [5] However, in contrast, Pham A T et al. [3] reported no significant association between stages of cancer and sleep quality. In the present study, 76% of patients with cancer for more than six months had poor sleep quality in comparison to those who were diagnosed with cancer less than six months ago ($p<0.05$). These findings are similar to those reported by Endeshaw D et al. [5]

Clinical Significance: This study provides the first region-specific evidence that poor sleep quality affects nearly 90% of cancer patients in J&K, with advanced stage, metastasis, and treatment delays being key clinical predictors. Since socio-demographic and behavioral factors are not significant, clinicians can focus on disease-related modifiable factors—particularly reducing time to diagnosis and treatment initiation. Routine PSQI-based screening and simple, low-cost sleep hygiene interventions can be readily integrated into existing oncology care pathways to improve patient outcomes.

Limitations: Although no local prevalence data were available for a formal sample-size calculation, we enrolled 350 consecutive patients — larger than most Indian single-centre studies on sleep quality in cancer and 83% of the size of the largest comparable study from a low-resource setting (Endeshaw et al., 2022; $n=420$). This gave high precision (95% CI width $\pm 3.3\%$) and $>80\%$ power to detect meaningful clinical associations. Therefore, sample size is not a limitation. The main limitations remain the cross-sectional design and restriction to one tertiary hospital.

CONCLUSION

Poor sleep quality is highly prevalent (89.4%) among cancer patients in Jammu, UT of J&K. Advanced cancer stage, distant metastasis, longer time since diagnosis (>6 months), and treatment delay (>28 days) are significant independent predictors of poor sleep. Socio-demographic and behavioral factors show no significant association. Routine sleep screening and timely treatment initiation are urgently needed in cancer care.

FUNDING: Nil

CONFLICTS OF INTEREST: NONE

AVAILABILITY OF DATA AND MATERIALS: The datasets generated and/or analyzed during the current study are available from the first and corresponding author on reasonable request. Please get in touch with Dr Ritika Chalotra (first author) at ritzverma96@gmail.com

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