Evaluation of a Focused Intervention for Sleep Disturbance in a Cancer Nutrition - Rehabilitation Program

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Background

- Sleep disturbance is gaining increased recognition in the context of cancer. Prevalence rates of between 30-75% have been observed and recent research points to the interplay of sleep with other symptoms such as pain,depression, fatigue and diminished quality of life.[1]
- The Cancer Nutrition – Rehabilitation (CNR) Program at the McGill University Health Centre provides outpatient interdisciplinary support to patients experiencing severe fatigue, weight changes, deconditioning and challenging symptoms including sleep disturbance.

CNR Interdisciplinary Team
- physicians
- nurses
- physiotherapist (PT)
- occupational therapist (OT)
- nutritionist
- psychologist
- social worker
- researchers

CNR Program Design
- 8-week program
- supervised exercise program with PT (1-2x/wk)
- home exercise plan
- individual follow-up in clinic with CNR team
- referrals for psychosocial support as required
- weekly psycho-educational groups
- caregiver education and support

- In 2008, the program introduced a focused nursing intervention targeting sleep disturbance.

Objectives

- To determine the prevalence and parameters of sleep disturbance in patients participating in CNR.
- To evaluate the effect of a focused nursing intervention that includes detailed evaluation of sleep disturbance and sleep hygiene instruction.
- To examine the overall symptom burden of CNR patients with and without sleep disturbance.

Methods

- A retrospective analysis of prospectively collected data was conducted on 156 cancer patients enrolled in the 8-week CNR program at the Royal Victoria Hospital in Montreal, QC, Canada from April, 2007 – December, 2009.
- All CNR participants completed the Modified - Edmonton Symptom Assessment Scale (ESAS) at the start and upon completion of the 8-week program.
- Sleep disturbance was defined at the initial patient evaluation as follows:
  - Sleep score ≥ 4 on the Edmonton Symptom Assessment Scale (ESAS)

    Slept Well | 0 1 2 3 4 5 6 7 8 9 10 | Didn't Sleep

    OR
  - Sleep/Insomnia problem indicated on the Distress Thermometer (DT).
- Patients with sleep disturbance who entered the program after August, 2008 received the focused nursing sleep intervention consisting of
  - Evaluation of sleep disturbance using the Pittsburgh Sleep Quality Index (PSQI)
    - 19 self-rated questions which assess 7 sleep components on a 0 – 3 scale yielding a Global PSQI score out of 21.
    - A Global PSQI score ≥ 8 warrants attention in cancer patients.[2]
  - Individualized teaching based on PSQI results.
  - Provision of written information on sleep hygiene.
- Paired t-tests were used to evaluate changes in ESAS scores and PSQI scores between the start and end of the CNR program.

Characteristics of Sleep Disturbed Patients

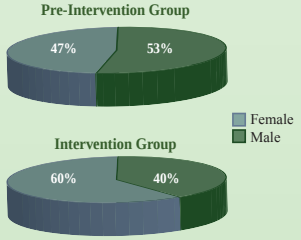
Table 1. Age Distribution

Age Range	Pre-Intervention Group; n = 47	Intervention Group; n = 54
< 18	0	1
18 - 40	3	10
41 - 65	29	31
> 65	15	12

Table 2. Cancer Diagnoses

Diagnosis	Pre-Intervention Group; n (%)	Intervention Group; n (%)
Breast	9 (19)	10 (19)
Head and Neck	6 (13)	6 (11)
Colorectal	2 (4)	8 (15)
Hepato-biliary, Pancreas	8 (17)	5 (9)
Leukemia / Lymphoma	4 (9)	6 (11)
Lung	3 (6)	4 (8)
Gynecological	1 (2)	3 (6)
Prostate	1 (2)	2 (4)
Other	13 (28)	9 (17)
Total	**47 (100)**	**53 (100)**

Figure 2. Sex Distribution



- Sleep disturbed patients in the Pre-Intervention and Intervention groups were similar in age, sex and type of cancer diagnoses.

Results

Figure 1. Flowchart of Patients and Group Assignments

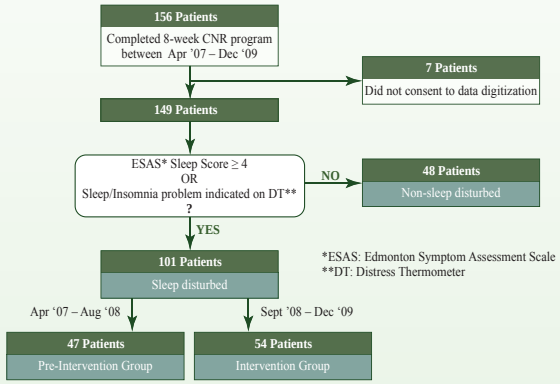
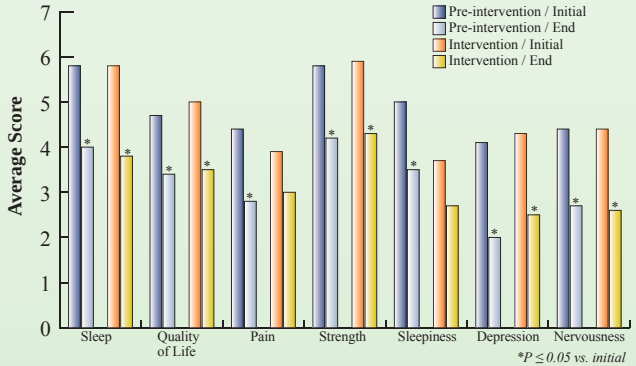


Figure 1 displays the resulting 3 distinct patient groups: those not reporting sleep disturbance (Non-Sleep Disturbed), those with sleep disturbance prior to the intervention (Pre-Intervention Group) and those who received the sleep intervention (Intervention Group).

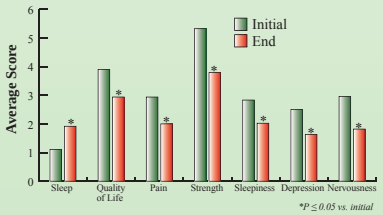
- 101/149 patients met the criteria for sleep disturbance – a prevalence of 67.8%

Figure 3. Changes in ESAS Scores for Sleep Disturbed Patients



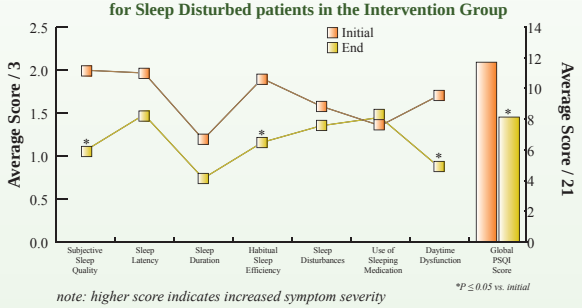
- Overall, sleep-disturbed patients showed a highly significant improvement (decrease) in their ESAS sleep scores (1.90 ± 2.50, P <0.0001) upon program completion. However there was no significant difference in the degree of improvement between the Pre-Intervention and Intervention groups.
- Sleep Disturbed patients also showed high initial ESAS scores (> 4) for quality of life, pain, strength, depression and nervousness, and improvement in these symptoms at the end of the CNR program ($P \leq 0.05$).

Figure 4. Changes in ESAS Scores for Non-Sleep Disturbed Patients



- In contrast, ESAS scores for sleep in the Non-Sleep Disturbed group significantly worsened (increased) (P = 0.01), although not to a level > 4. Only the ESAS score for strength in this group was > 4 at program outset. Nevertheless, all symptoms except for sleep, significantly improved upon program completion ($P \leq 0.05$).

Figure 5. Changes in PSQI Components and Global Score for Sleep Disturbed patients in the Intervention Group



note: higher score indicates increased symptom severity

- Sleep Disturbed patients who received the intervention significantly improved their subjective sleep quality, habitual sleep efficiency and daytime dysfunction ($P \leq 0.05$) which gave rise to an overall improvement in the Global PSQI score (3.32 ± 4.00, P = 0.0007). Sleep latency, sleep duration, sleep disturbances and use of sleeping medication, however, did not change after the 8-week CNR program.
- Interestingly, no correlation (r = 0.05, P = 0.25) was found between the sleep improvement as measured by the PSQI global score and ESAS sleep score.

Discussion

- Sleep disturbed CNR participants described a higher overall symptom burden. Similar symptom clusters have been reported to adversely affect both short and long term outcomes in cancer patients of various diagnoses.[3,4] This highlights the need to identify and eliminate factors that trigger and perpetuate sleep problems in this group.
- During the 8-week CNR program, many sleep quality interventions were undertaken by various team members including exercise, behavioural therapy, relaxation training, meditation and treatments for pain, anxiety and depression. The interdisciplinary nature of the program may therefore account more for sleep improvement than the focused nursing intervention itself.
- Despite lower overall symptom severity, ESAS sleep scores for those patients not reporting sleep disturbance actually worsened suggesting that this group could also benefit from guidance to promote good sleep.

Limitations

- Use of a single item, short-term measure to select patients with sleep disturbance may have resulted in a skewed estimation of overall prevalence.
- Cancer patients referred to CNR have complex needs requiring interdisciplinary support. Our findings cannot be generalized to other settings.
- We used patient self-report measures to evaluate sleep disturbance. Use of objective measures (actigraphy or polysomnography) may have strengthened our findings.

Conclusions

- Sleep disturbance is a prevalent problem in CNR participants which can be significantly reduced through participation in an 8-week interdisciplinary CNR program.
- The PSQI provides a comprehensive understanding of sleep disturbance which helps individualize interventions for this important symptom.
- Future research is needed to examine sleep disturbance in different cancer populations and at specific times in the cancer trajectory using both subjective and objective measures.

References

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Acknowledgements: Thanks to the team members for their contribution to the success of the CNR – Dr. N. MacDonald, M. Jelowicki, J. Lemoignan, S. Amdouni, Dr. P. Di Dio, V. Lee, S. Schulman, S. Carrière, & J. Murphy