



PRELIMINARY EFFICACY OF ESSENTIAL OILS FOR IMPROVING SLEEP QUALITY AND FATIGUE IN AN INDIVIDUAL WITH PROSTATE CANCER: A CASE REPORT

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Abstract – Objective: Androgen deprivation therapy (ADT) is the main treatment for metastatic hormone-sensitive prostate cancer (mHSPC). Fatigue and loss of sleep quality are the side effects of ADT, which reduces the quality of life in these patients. Aromatherapy is one of the complementary and alternative medicines (CAM) that are effective on psychological indices.

Patients and Methods: In an A₁B₁A₂B₂ study, from February to September 2019, a 64-year-old man treated with methadone, with diagnosis of localized prostate carcinoma after radical prostatectomy and receiving ADT was selected through Respondent-Driven Sampling (RDS). The patient was treated with underwent aromatherapy massage in two three-week stages (B₁ and B₂) and received Routine Therapy in the other two stages (A₁ and A₂). The effectiveness of treatment on two indices of sleep quality and fatigue severity was considered as primary outcomes and the association of two indices was considered as secondary outcomes. Data were analyzed by means of a generalized estimation equation (GEE) and repeated measures correlation (rmcorr) through IBM SPSS Statistics Version 20.

Results: Primary outcomes showed that aromatherapy massage was associated with improvement in sleep quality and decreased fatigue ($p < 0.01$). Secondary outcomes also showed that there was a significant negative relationship between sleep quality and fatigue severity ($p < 0.05$).

Conclusions: The results of this study, while confirming the effectiveness of aromatherapy on psychological aspects in a patient with cancer, can be promising in designing new therapeutic in CAM and be used by oncology setting.

KEYWORDS: Aromatherapy, Prostate cancer, Fatigue, Sleep, Surgical oncology.

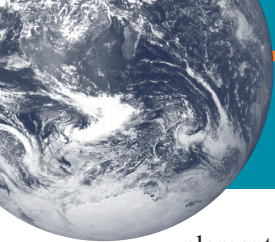
INTRODUCTION

The prostate cancer is considered as one of the most common cancers in men. Androgen deprivation therapy (ADT) is the main treatment in the hormonal-sensitive metastatic prostate cancer¹. Fatigue is a common side effect in cancer patients². In addition, an increase in fatigue was observed in patients un-

dergoing new hormonal treatments in prostate cancers, especially ADT³. Significant decrease in the serum level of testosterone induced by ADT causes many side effects such as cognitive dysfunction, sexual dysfunction, fatigue, and poor sleep quality and can reduce quality of life⁴. Patient with prostate cancer undergoing androgen deprivation therapy are at risk of sleep disorder⁵. Today, the use of com-



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plementary therapies in the field of cancers attracted many attentions by the therapists⁶. Over 30% of European patients with cancer are using some form of Complementary or/and Alternative Medicine (CAM) and are named as new care dimension: integrative medicine in oncology⁷. Conventional medicine is replaced with alternative medicine and evidence showed that using CAM is growing globally⁸. The use of essential oils (EOs) has been used in traditional medicine for a long time and the effectiveness of aromatherapy massage for managing fatigue, insomnia, stress, anxiety and depression has been reported to be desirable in patients with cancers⁹. In contrast, the results of the study by Tamaki et al¹⁰ suggest the ineffectiveness of aromatherapy massage on sleep quality in women with breast cancer. At the same time, the relaxation and pleasure effects of aromatherapy massage has been reported as significant by this study.

Considering the contradictory findings in this area and in light of the suggestion of Kim et al¹¹ regarding the importance of fatigue index in predicting the quality of life in men receiving ATD and the necessity of designing effective interventions in this field, the present study was carried out.

CASE REPORT

We used a reversal ABAB design with multiple baselines, which A was the stage line and B was the intervention phase. The patient was a 64-year-old man treated with methadone maintenance treatment (MMT), who has had done radical prostatectomy for localize prostate cancer two years ago (according to the union for international cancer control's (UICC) criteria) and was receiving ADT and was selected through Respondent-Driven Sampling (RDS). The patient was diagnosed as a substance use disorder according to the international classification of diseases, ninth revision, clinical modification (ICD-11). RDS was used in this study that is a combination of snowball or chain sampling and a mathematical model (Markov Chain Theory and Network Bias) and it is taken into consideration nowadays in large health organizations such as World Health Organization (WHO). In addition to aromatherapy massage, the patient was treated with 40 mg per day Degarelix (Firmagon) and methadone (Syrup, 30-35 cc/per day). Patient was entered in the process of treatment while complaining of fatigue and insomnia. The entire treatment process was 12 weeks that was provided throughout the course of MMT. In the baseline A₁ (three weeks, three evaluations) and A₂ (three weeks, three evaluations), only ADT was provided along with maintenance treatment, and at the intervention stage B₁ (three weeks, six evaluations) and B₂ (three

weeks, six evaluations), in addition to methadone, aromatherapy (weekly forty minutes) was presented. After doing medical examinations, clinical interview and receiving informed consent, aromatherapy massage was performed for 40 minutes, twice a week in the intervention stages by a trained therapist. A bottle containing 20 mg of oil mixed with 4 drops of lavender, peppermint and rosemary oils in 15 mL of jojoba oil was provided to the participant (Tisserand, London, England). The treatment dose was selected based on previous reports. According to the same protocol, the participant was provided with the necessary training on massage and the use of mixed oils on the back of the ears. In this study, demographical checklist, Structured Clinical Interview for DSM-5 (SCID-5), Pittsburgh Sleep Quality Index (PAQI) and Fatigue Severity Scale (FSS) were used. The evaluation of two indices of sleep quality and fatigue severity was considered as the primary outcome and the relationship between the two indices was considered as the secondary outcome. The data was analyzed by means of a generalized estimation equation (GEE) and repeated measures correlation (rmcorr) through IBM SPSS Statistics Version 20 (IBM Corp., Armonk, NY, USA). All stages of the study were performed according to the latest version of the Declaration of Helsinki (DoH).

RESULTS

Primary outcomes showed that 6 weeks of treatment in stages B₁ and B₂ had a significant effect on Sleep Quality and Fatigue Severity (Figure 1 and 2).

The GEE model results showed that there is a significant decrease in the PSQI ($p < 0.01$, Figure 1).

Also, the GEE results showed that there is a significant decrease in the FSS ($p < 0.01$, Figure 2). Also, the results of r_{mcorr} showed that there is a significant negative relationship between the two Sleep Quality and Fatigue Severity ($p < 0.05$).

$$r_{\text{mcorr}}(1, \text{Sleep Quality} - \text{Fatigue Severity}) = 0.69, 95\% \text{ CI } [0.78, 0.59], p < 0.05.$$

DISCUSSION

The present study was conducted aimed to investigate the effectiveness of aromatherapy massage on improving quality of life and reducing fatigue in a patient with prostate cancer. The primary outcomes showed that aromatherapy massage improved the sleep quality and decreased fatigue. Secondary outcomes also showed a reverse relationship between the two indices. Our results are consistent with the results of the study by Izgu

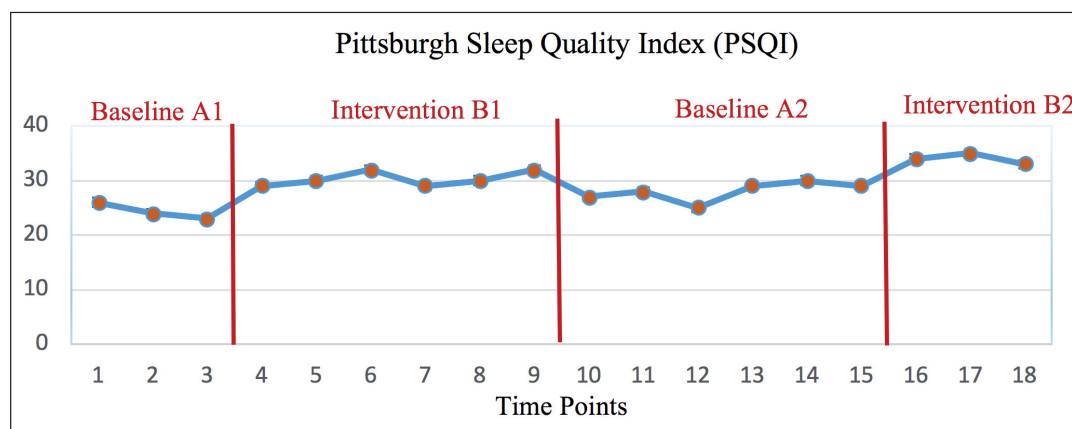


Fig. 1. Pittsburgh Sleep Quality Index over the eighteen time points.

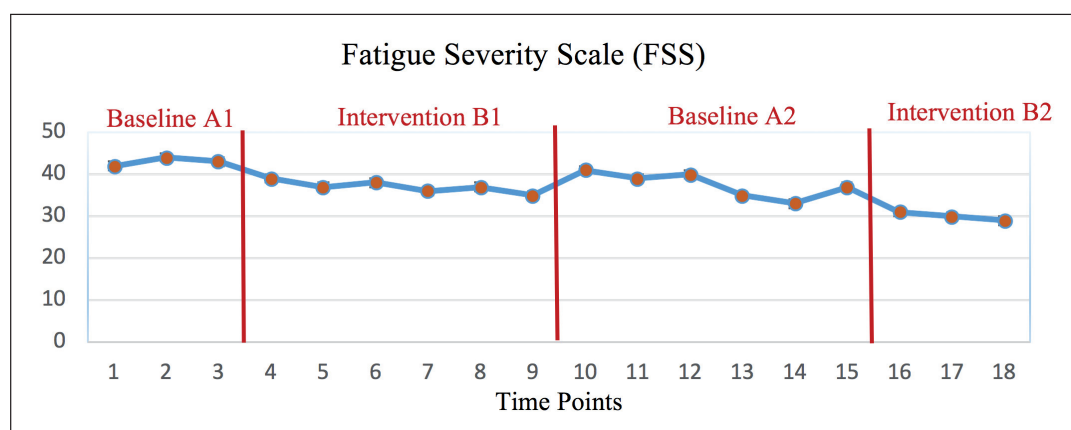


Fig. 2. Fatigue Severity Scale over the eighteen time points.

et al¹² that showed that the use of aromatherapy massage in fatigue management in patients with cancer was desirable by this study. Also, in line with the results of the present study, Blackburn et al⁹ in a study showed that aromatherapy massage was effective in controlling insomnia and reducing fatigue, stress, anxiety and depression in patients with cancer. Contrary to the results of this study, the effectiveness of aromatherapy massage on the quality of sleep in women with breast cancer was reported insignificant by Tamaki et al¹⁰. However, this difference in the two results can be explained based on the difference in the used fragrances. One of the limitations of the present study was the lack of control of the role of the massage position (in isolation) and the relationship between the position with the olfactory system, which can be investigated in future studies. It is suggested that manual massagers, visual podcasts and other aromatherapy essences could be used in future studies. A clinical trial to evaluate the optimization of non-pharmacologic pain management can be a good route for future studies.

CONCLUSIONS

The findings of the present study were in line with research background suggesting the efficacy of aromatherapy to improvement in sleep quality and decreased fatigue. Also, there was a significant negative relationship between sleep quality and fatigue severity. These findings can be promising in designing new therapeutic in oncology setting.

ACKNOWLEDGMENTS:

Special thanks to all participants who took part in this study. The authors appreciate the personnel at the Cancer Clinic for their contribution in data collection.

AUTHOR CONTRIBUTION:

BP designed the study, wrote the protocol and managed the literature searches, collected data, and wrote the first draft of the manuscript. KP performed the statistical analysis. PS provided advice for the study design and helped in writing the manuscript. PM and A.R.Z provided advice for the study design and helped in writing the manuscript. All authors read and approved the final draft of the manuscript.



CONFLICT OF INTEREST:

The authors declare that they have no conflict of interests.

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