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RESEARCH ARTICLE

RELATIONSHIP BETWEEN SLEEP QUALITY AND CHRONIC NECK PAIN IN ADULTS

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ABSTRACT

Introduction and purpose: The aim of the study is to observe the relation between chronic neck pain and sleep quality in the adult population. **Materials and Methods:** For declared purpose; 100 volunteer adults (aged between 18 to 45) having neck pain more than three months filled the Neck Disability Index (NDI) and Pittsburg Sleep Quality Index (PSQI). Participants excluded if they had specific neck pain, surgery in the past one year, physical therapy in the last six months or if they are pregnant. **Results:** Due to all information and statistically analysis run in the SPSS Version 1.6; The mean age of the sample was 29.5 ± 4.25 ; and gender distribution is 64% female 36% male. NDI score mean 9.7 ± 10.37 under 50 points and participants score ranging between 0 and 36. BMI mean 25.31 ± 7.12 and PSQI mean 6.91 ± 2.50 under 21. Correlation between neck pain and sleep quality was found 0.62. **Conclusion:** Negative findings in individuals with non-specific chronic neck pain can affect the individual's sleep quality. Although medium correlation found between neck pain and sleep quality in response, patients may face many of the traditional compensatory strategies in an effort to improve sleep quantity and quality.

INTRODUCTION

Chronic pain has an "International Association for the Study of Pain" (IASP) definition. According to their literature, "Chronic pain is that pain which persists past the normal time of healing. In practice, this may be less than a month or more than six months". It is conservatively estimated that between 40 and 70 million people are affected by Chronic pain and that as many as 70% of the patients complain of poor sleep (R. Hadzic *et al*, 2017). Neck pain may result in disability, limitations in activities and restrictions in participation in daily living. Current acute pain from any source can lead to sleep disruption simply because a person is uncomfortable or activated by the pain. The majority of previous research into sleep disturbance and musculoskeletal pain were based upon self-report measures in heterogeneous patient groups (e.g. headache, neck pain, back pain, fibromyalgia) (G.M. O'Donoghue *et al*, 2009; J.E. Graham & K.L. Streitel, 2010). Impaired physical functioning and psychological distress, such as high levels of anxiety and depression, are seen in association with the pain. The physiological mechanisms behind the pain relieving effects, and possibly the ability to improve psychological functioning, are to some extent explained by activation of central mechanisms (M. Engstrøm *et al*, 2013). Insufficient quantity and quality of sleep could well be related to the increased prevalence of musculoskeletal pains.

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Some early studies suggest that tiredness, difficulties in falling asleep, awakening at night and other sleep problems are risk factors for musculoskeletal pains. The quantity and quality of sleep could be a potentially modifiable risk factor for musculoskeletal pains (J.P. Auvinen *et al*, 2010). Most of the studies examining sleep and pain have been conducted with Chronic pain sufferers and have found the association between current pain intensity and sleep complaints to be positive, moderate and significant (A.Long *et al*, 2008; J.P. Auvinen *et al*, 2010; S. Evans *et al*, 2017; S. Davin *et al*, 2014). The importance of this study is to investigate the relation between sleep disorders and non-specific chronic neck pain and to realise if they are associated more frequently than one would expect.

MATERIALS AND METHODS

100 volunteer included to the study which designed to claim relationship between sleep quality and chronic neck pain. Inclusion criterias for this study were; non-specific chronic neck pain (3 months duration), being age between 18 and 45 years as the exclusion criterias were having specific neck pain, having surgery in the cervical region in the last 1 year, having cardiovascular or pulmonary diseases, having physical therapy for cervical area in last 6 months, having significantly diminishing physical capacity, pregnancy, addiction to drugs, extensive psychological or behavioral problems. Outcome parameters were assessed with 2 questionnaires: Pittsburg Sleep Quality Index (M. A. Grandner *et al*, 2006) (PSQI) and Neck Pain Disability Index (I. A. Young *et al*, 2010)

(NPDI), socio-demographic information collected by self questionnaire (gender, age, habit for sport, body-mass index). Statistical analysis were performed by using SPSS.Version.16. The PSQI is a 19 item questionnaire, which assesses subjective sleep quality and quantity, sleep habit related to quality and occurrence of sleep disturbances in adults over a 1-month interval. The 19 individual items are used to generate the following seven component scores: subjective sleep quality (one item), sleep latency (two items), sleep duration (one item), habitual sleep efficiency (three items), sleep disturbances (nine items), use of sleep medication (one item), and daytime dysfunction (two items). Each component score is equally weighted on a 0–3-scale, where 0 indicates no difficulty and 3 indicates severe difficulty. Collectively, the aforementioned result to a score that corresponds to global subjective sleep quality, ranging between 0 and 21; higher scores on the global index indicate more sleep complaints and lower sleep quality (M. Y. Ağargün *et al.*, 1996). The NDI consists of 10 items. Each item has six different assertions expressing progressive levels of pain or limitation in activities. Item scores range from 0 (no pain or limitation) to 5 (as much pain as possible or maximal limitation). The total NDI score ranges from 0 to 5 points. Higher scores indicate greater disability (M. J. H. McCarthy *et al.*, 2007).

RESULTS

There were 100 respondents to the study. Sleep quality was assessed in 100 patients with non-specific chronic neck pain. Baseline characteristics of the study population are presented in the Table 1. The majority were females (64%) and most participants were student (58%). In the Table 2, severity of the pain are presented, as results of NDI and PSQI scores are shown in the Table 3. NDI score mean 9.7 ± 10.37 under 50 points and participants score ranging between 0 and 36. BMI mean 25.31 ± 7.12 and PSQI mean 6.91 ± 2.50 under 21. Correlation between neck pain and sleep quality was found 0.62 which indicates large correlation. ($r= 0.5-1.0$ was large; $r= 0.30-0.49$ was medium; and $r= 0.1-0.29$ was small).

Table 1. Baseline characteristics of the study population

	N	Min	Max	Mean	SD
Bmi	100	16.53	35.05	25.32	7.12
Age	100	18	65	29.50	4.25
Habit for sport	100	1 (NO)	2 (YES)	1.68	0.17

Table 2. Severity of the pain

		severity of the pain			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no pain now	61	61,0	61,0	61,0
	low pain	18	18,0	18,0	79,0
	mid severity pain	17	17,0	17,0	96,0
	mid severity but everytime	4	4,0	4,0	100,0
	Total	100	100,0	100,0	

Table 3. Results of study outcomes

	Mean	SD
PSQI Score	6.91	2.50
NDI Score	9.70	10.37

DISCUSSION

M.T.Smith *et al.* (2000) characterize the extent and nature of sleep complaints of chronic pain patients and to examine the factors that predict sleep quality. A heterogeneous sample of

51 outpatients with benign, chronic pain was recruited from newspaper and pain clinic advertisements. Patients completed a variety of self-report instruments including the Multidimensional Pain Inventory, the Pittsburgh Sleep Quality Index, the Pre-Sleep Arousal Scale, and the Beck Depression Inventory. Sleep complaints were reported by 88% of the sample. Presleep cognitive arousal, rather than pain severity, was found to be the primary predictor of sleep quality such interventions may also positively affect pain perception and/or patients' ability to cope with chronic pain (M.T. Smith *et al.*, 2000). In this study we can support the idea of acute pain may effect with the ability to initiate or maintain sleep. In response, patients may face many of the traditional compensatory strategies in an effort to improve sleep quantity and quality. Engstrom M. *et al.* (2013) have performed a blinded, prospective exploratory study with case-control design. Thirty-four healthy controls, 33 sleep-related migraine attacks, 15 non-sleep related migraine attacks, questionaired on sleep and headache related aspects. Findings indicating foregoing sleep deprivation as foregoing sleep times were normal (M. Engstrom *et al.*, 2013). In our research, we don't have control group maybe in further studies that can be considered by the researchers. According to research findings belong to Auvinen JP. (2009) *et al.* insufficient quantity or quality of sleep is an independent risk factor or at least concomitant with neck and low back pain. The potential mechanisms behind the effect of insufficient quantity and quality of sleep on neck and low back pains are highly speculative and require further research (J.P. Auvinen *et al.*, 2010). As our research claims medium correlation between neck pain and sleep quality, we agree that the further researchers are required. Kovacs FM *et al.* (2015) studied on 422 adults, claim that curing neck pain by physiotherapy intervention can improve sleep quality. Reduction in pain level indicates better sleep as they show in the study (F. M. Kovacs, J *et al.*, 2015). These information are paralel to our research findings. Intervention studies should be carried out to test whether interventions aimed at improving quality and/or increasing quantity of sleep are effective in the prevention and treatment of musculoskeletal pains. The current findings generalise to other long term conditions that are characterised by neck pain and reduced sleep quality to varying degree. But further researches, with higher number of volunteers are needed.

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