

The evaluation of the impact of the use of wool in patients with fibromyalgia on life quality

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KEY WORDS

Fibromyalgia, wool, life quality, pain, sleep
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ABSTRACT

Objective

The study was conducted to evaluate the impact of the use of wool on the quality of life of patients with fibromyalgia.

Design

The study was conducted in two stages with a single-group pre-test/post-test model (before trial test model).

Setting

The research was conducted in a physical therapy and rehabilitation outpatient clinic and in patient's homes in Ankara, Turkey.

Subjects

36 patients diagnosed with fibromyalgia according to the criteria of the American College of Rheumatology were included in the study.

Interventions

The patients did not use wool in the first stage (7 weeks) and used woollen underwear, bed coverings, mattresses and woollen cushions in the following second stage (20 weeks).

Main outcome measures

Study data was collected using a general questionnaire, a Life Quality Scale (Nottingham Health Profile), Visual Analogue Scale (VAS 0-10), Pittsburg Sleep Quality Index, the number of tender points, and checklists.

Results

During the period when the patients used wool, it was found there were significant improvements in pain score (before using wool= 7.26 ± 1.42 ; after using wool= 1.93 ± 0.74), tender points count (before= 14.88 ± 2.43 ; after= 5.97 ± 2.56), Nottingham Health Profile (before= 74.28 ± 10.73 ; after= 5.98 ± 1.07) and Pittsburg Sleep Quality Index (before= 10.02 ± 3.59 ; after= 2.52 ± 1.69) ($p < 0.001$).

Conclusion

There were significant improvements in pain score, tender points count, Nottingham Health Profile in all sections, and the Pittsburg Sleep Quality Index and its components, as a result of the use of woollen underwear, woollen bed coverings, woollen mattress cover and woollen cushions in patients with fibromyalgia.

INTRODUCTION

The syndrome of fibromyalgia has been defined as a constellation of complaints including diffuse chronic pain and the presence of tender points (Burkham and Haris 2005). It is often accompanied by generalised weakness, muscle and joint aches, unrefreshing sleep, fatigue, stiffness, tension headache, irritable bowel and bladder syndrome, cognitive dysfunction, complaints of dry eyes, paresthesias, and restless leg syndrome (Goldenberg 2003; Cantürk 2000; Çapaci and Hepgüler 1999). The aetiology of fibromyalgia is unknown and the pathogenesis is not clearly understood. Treatment of fibromyalgia is difficult and requires a multi-disciplinary approach using both pharmacological and non-pharmacological interventions (Goldenberg 2003; Lash et al 2003; Çapaci and Hepgüler 1999). The goals of treatment are to reduce pain, improve quality of sleep, and increase physical activity to maintain muscle health and activities of daily functioning (Lash et al 2003; Cantürk 2000).

In various studies it was found that the quality of life for patients with fibromyalgia was lower than that for healthy controls (Madenci et al 2003; Martinez et al 2001; Neumann et al 2000). Limitations caused by pain, fatigue, decreased muscle strength and endurance, influence work capacity (Hendriksson et al 2005) and affected activities of daily living and quality of life (Karaaslan 2003; Akgün and Eryavuz 2001).

Patients with fibromyalgia were particularly affected by the cold, with cold weather aggravating the symptoms (Fan 2004; Öncel 2001; Jeffrey and Thompson 2000; Cantürk 2000; Çapaci and Hepgüler 1999). For most women with fibromyalgia, the pain was most severe when the weather was damp, rainy or cool (Schafer 1997), however all patients with fibromyalgia showed weather sensitivity (Jennifer et al 2004). Research demonstrated that cold or humid weather increased symptoms in patients with fibromyalgia while warm, dry weather reduced or relieved symptoms (Yunus et al 1981).

In humans, a function of clothes is to protect the body against the climate and changes in climate (Guyton

and Hall 2001; Ulusoy and Görgülü 1997; Çakircali 1996). Wool, in particular, an animal fibre, has been shown to have better a heat retaining capacity than fibres made from plants or synthetic fibres and is often used to keep people warm (Gürçüm 2005; Yazicioğlu 2000; Turkish Ministry of National Education 1996). It was thought that if patients with fibromyalgia, who have sensitivity to cold, used woollen underwear, woollen bed coverings, woollen mattress cover and woollen cushions they would be better able to maintain their body heat and their quality of life would be improved.

Aim

This study was conducted to evaluate the impact of the use of wool on the quality of life of patients with fibromyalgia.

METHODS

Patients

36 patients diagnosed with fibromyalgia according to the criteria of the American College of Rheumatology, who did not have other diseases, who were older than 18 years of age and who lived within the boundaries of Ankara metropolitan municipality, Turkey, were included in the study. Two months before the patients commenced the study and throughout the research, they did not participate in any other physical treatment programs and did not use regular anti-depressant drugs.

Study Design and Interventions

The study, which was a single-group pretest/post test model (before trial test model) was carried out in two stages. In the first period of seven weeks, the patients did not use wool. At the start of the first stage, the Nottingham Health Profile and the Pittsburg Sleep Quality Indexes were applied (before wool-1) to the patients. During the first stage, the patients assessed their pain levels by means of the Visual Analogue Scale (VAS 1-10) for each day and recorded on a checklist the pharmacologic and non-pharmacologic methods used. At the end of the first stage, Nottingham Health Profile and Pittsburg Sleep Quality Index (before wool-2) were applied to the patients and tender points (before wool) were examined and recorded.

In the second stage of 20 weeks duration, the patients used woollen underwear, woollen bed covers, woollen mattresses and woollen cushions every day. Woollen underwear used by the patients was made from 75% merino wool and 25% acrylic. The mattresses and cushions used by the patients were made from 100% lambs wool. A 100% lambs wool sheet which was nearly 1 cm thick was used as a mattress cover.

The patients assessed their pain levels daily by means of Visual Analogue Scale and recorded on a checklist the pharmacologic and non-pharmacologic methods used. In the 10th week (middle of wool) and in the 20th week (end of wool), Nottingham Health Profile and Pittsburg Sleep Quality Index were applied. An examination of tender points was made at the end of the 20 week period (after wool).

Data was collected during the period 14 November 2005 and 2 June 2006. Throughout the study, patients were interviewed four times and each of the patients was visited in their house nine times. Additionally, telephone interviews were often made.

Measurements

The data was collected using a general questionnaire, the Visual Analogue Scale (VAS 0-10), Nottingham Health Profile, Pittsburg Sleep Quality Index, tender points count, and checklists.

A general questionnaire was used to collect socio-demographic data and clinical features of the patients.

The Visual Analogue Scale (VAS 0-10) was used for the assessment of pain intensity (0=no pain, 10=most severe pain).

The Nottingham Health Profile (NHP) is one of the generic health states instruments that have been used in a wide range of diseases to assess subjective perception of physical, emotional and social aspects of illness and to monitor the progress of the disease and impact of therapy. It comprises 38 statements (answered 'yes' or 'no') in six sections: physical mobility (8 items), pain (8 items), sleep (5 items), emotional reaction (9 items), social isolation (5 items) and energy level (3 items). Scores for each section can range between 0-100 with a higher score

indicating a more severely compromised quality of life. A Turkish version of NHP scale has been developed and thoroughly tested for reliability and validity for use in Turkey (Küçükdeveci et al 2000).

In order to measure sleep quality, the Pittsburg Sleep Quality Index (PSQI) was used. The Pittsburg Sleep Quality Index is a self-administered questionnaire which assesses quality of sleep during the previous month and contains 19 self-related questions with seven components: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, the use of sleep medications, and daytime dysfunction. Each component is scored from 0 to 3, yielding a global PSQI score between 0 and 21, with higher scores indicating lower quality of sleep. This study administered the Turkish validated version of the PSQI (Ağargün et al 1996). The tender points examination and count was made by a physical treatment and rehabilitation expert.

Daily checklists were developed to determine the pharmacologic (analgesics, muscle relaxants, nonsteroidal anti-inflammatory medications and sleeping medications) and non-pharmacologic (massage, heat and exercises) methods patients used. The checklists consisted of statements which were answered as either 'yes' or 'no'.

Data Analysis

The data from the study were assessed using the Statistical Package for Social Sciences (SPSS) 11.5 for Windows.

Socio-demographic data and patient's clinical features included in the study were calculated as number-percentage and mean-standard deviation.

Pain scores of the patients calculated every day were divided by the number of days and mean pain scores were obtained. When pain score averages in the before wool (7 weeks) and the after wool (20 weeks) were compared, paired samples t-test was used.

In the comparison of before wool and after wool tender points count, paired samples t-test was used.

In the comparison of Nottingham Health Profile in all sections and Pittsburg Sleep Quality Index before and after the patients used wool, paired samples t-test was used.

The answers given in the checklist by the patients were calculated as two different data sets, as in 'before' the wool (the first stage 7 week period) and 'after' the wool (the second stage 20 week period). When the scores, using the formula 'yes/total number of days' were compared, paired samples t-test was used.

Ethical Consideration

Ethics approval for the research was given in writing by the Ethics Board of Hacettepe University, Surgery and Medicine Applications.

FINDINGS

The mean of age of participants in this study was 38 and mean disease duration was 7 year. All the patients were female; 69.4% were elementary school graduates; 88.9% were married; and 72.2% were not employed. All the patients used cotton or synthetics underwear; 86.1% slept on ready-made beds using a synthetic mattress; and 91.7% used synthetic cushions. All the patients reported sensitivity to cold (table 1).

Table 1: Baseline clinical and socio-demographic characteristics of patients (n=36)

Variables	n (%)
Age, years mean (SD)	38.31 (8.38)
Disease duration years, mean (SD)	6.86 (4.92)
Female	36 (100.0)
Married	32 (88.9)
Single	4 (11.1)
Elementary school	25 (69.4)
Secondary school	6 (16.7)
University / high school	5 (13.9)
Employed	10 (27.8)
Not employed	26 (72.2)
Cold sensitivity	36 (100)
The feature of the underwear Cotton and/or synthetic	36 (100)
The feature of the bed Orthopaedic ready-made bed	36 (100)
The feature of the mattress Synthetic	31(86.1)
Cotton	5 (13.9)
The feature of the cushion Synthetic	33 (91.7)
Bird feather	3 (8.3)

(SD=standard deviation)

In the first stage of 7 weeks when the patients did not use wool (before wool-1) and at the end of this period (before wool-2), there were no significant differences in the Nottingham Health Profile in all sections and the Pittsburg Sleep Quality Index in all its components ($p>0.05$).

During the period when the patients used the wool, there was significant improvement in all components of the Pittsburg Sleep Quality Index and Nottingham Health Profile in all sections, pain score, and tender points count (table.2).

During the period when the patients used the wool, a reduction in the use of pharmacologic (analgesics, muscle relaxants, nonsteroidal anti-inflammatory medications, sleep medications) and non- pharmacologic (massage, heat and exercises) was observed ($p<0.05$), (table 2).

No significance was observed in the Nottingham Health Profile in all sections and the Pittsburg Sleep Quality Index in all its componets when comparing the middle of the period when the patients used the wool (middle of wool) and at the end of the period when the patients used the wool (end of wool) ($p>0.05$).

DISCUSSION

In a study carried out by Jeschonneck et al (2000) it was found that the temperature of skin on tender points was lower in patients with fibromyalgia than in healthy individuals and that the concentration of erythrocytes was higher but their speed and fluidity was lower in patients with fibromyalgia compared to healthy individuals ($p<0.001$). Jeschonneck et al attributed the pain in tender points in fibromyalgia to the reduction of local blood flow (Jeschonneck et al 2000). In this study, woollen underwear used by patients covered all the tender points such as trapezius, supraspinatus, gluteal, greater trochanter, low cervical, second rib and lateral epicondyle except for tender points such as those that occur on occiput and knee. In this study it was found that, in the period when the patients used wool, there was a significant reduction in pain score and tender points count (table 2). The reason for the reduction in pain level and tender point counts is thought to relate to the warmth of the wool leading to an increase in local blood flow reducing the pain as circulation increases.

Table 2: Comparisons of pain, tender points count, Nottingham Health Profile, Pittsburg Sleep Quality Index scores and pharmacologic and non-pharmacologic methods used (n=36)

Measure (score range)	Before using wool	After using wool	Significance	
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
Pain, VAS (0-10)	7.26±1.42	1.93±0.74	t=21.43	0.000
Tender points count (0-18)	14.88±2.43	5.97±2.56	t=14.71	0.000
Nottingham Health Profile and sections (0-100)				
Total NHP score	74.28±10.73	5.98±1.07	t=26.67	0.000
Physical mobility	52.43±11.86	12.5±6.68	t=17.58	0.000
Energy	97.22±9.34	2.77±9.33	t=38.02	0.000
Pain	97.57±7.20	3.47±7.07	t=53.47	0.000
Sleep	60.55±24.60	3.88±9.34	t=12.28	0.000
Social isolation	65.55±28.53	5.24±11.4	t=11.01	0.000
Emotional reactions	85.66±19.98	5.24±11.4	t=19.35	0.000
Pittsburg Sleep Quality Index (0-21) and components (0-3)				
PSQI scores	10.02±3.59	2.52±1.69	t=10.43	0.000
Subjective sleep quality	2.11±0.57	0.41±0.50	t=11.44	0.000
Sleep latency	1.88±1.18	0.69±0.74	t=5.009	0.000
Sleep duration	0.72±0.97	0.11±0.31	t=3.92	0.000
Habitual sleep efficiency	0.55±0.96	0.05±0.23	t=2.91	0.006
Sleep disturbances	1.91±0.36	0.94±0.33	t=13.07	0.000
Use of drugs for sleep	0.44±0.99	0.00±0.00	t=2.67	0.011
Daytime dysfunction	2.38±0.72	0.30±0.52	t=13.33	0.000
Used pharmacologic and non-pharmacologic methods (0-1)				
Analgesics	0.44±0.29	0.08±0.10	t=7.84	0.000
Other drug	0.30±0.40	0.09±0.22	t=3.66	0.001
Massage	0.31±0.24	0.07±0.05	t=6.58	0.000
Heat	0.33±0.28	0.07±0.08	t=5.84	0.000
Exercise	0.23±0.27	0.15±0.24	t=2.67	0.011

(\bar{X} = mean, SD = standard deviation, t = paired samples t-test)

Women with fibromyalgia report difficulties in managing practical tasks requiring muscle strength and muscle endurance. Commonly mentioned work tasks and activities include repetitive movements, static muscle work as in holding tools and other objects and standing or sitting in the same position for long periods (Hendriksson et al 2005). During the period when the patients used wool in this study, they reported they were able to carry heavy loads, were able to stay in the same position for a longer period, and were able to perform repetitive movements and physical activities more easily.

In this study during the period when patients used wool, there were significant improvements in

the physical mobility and energy sections of the Nottingham Health Profile (table 2). It is thought that the warmth generated by the wool affected muscle strength and endurance in the patients with fibromyalgia in a positive direction.

Patients with fibromyalgia usually report unrefreshing and non-restorative sleep. They have an abnormality of the deepest stage of sleep, delta-wave sleep (Burkham and Haris 2005). In the literature, it is emphasised that body heat is reduced in the deepest stage of normal sleep (Potter and Perry 1997). During the period when the patients used wool in this study, it was found there were significant improvements in the Pittsburg Sleep Quality Index

in all its components (table 2). From the first day when the patients commence to use the wool, they reported they had a refreshing sleep. It is thought that the use of the wool (bed covers, mattress cover and cushions) prevented heat loss during sleep, thus promoting refreshing and restorative sleep.

CONCLUSION

This study found significant improvements in pain score, tender points count, Nottingham Health Profile in all sections, and the Pittsburg Sleep Quality Index in all its components as a result of the use of woollen underwear, woollen bed covers, woollen mattress cover and woollen cushions in patients with fibromyalgia.

RECOMMENDATION

In order to evaluate the efficacy of wool in patients with fibromyalgia, it is suggested that controlled studies using a broader sampling group should be conducted.

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