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Original Research Article

Efficacy of postural awareness by booklet on back pain among the sweet makers

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ABSTRACT

Background: The purpose of the study was to identify the efficacy of postural awareness by a booklet on back pain among sweet makers. Objective was to explore socio-demographic (age, gender, educational status, occupation) characteristics of sweet-makers with back pain. To compare the rating of pain intensity before and after postural awareness by a booklet with the back pain of sweet-makers.
Methods: This study was conducted by pre-test post-test experimental study in which a total of 25 sweet-makers were selected with back pain from January 2021 to December 2022. Data were collected by using the functional rating index questionnaire to evaluate the activity of daily living and pain measured by the visual analogue scale questionnaire. Statistical package for the social sciences (SPSS) was used for data analysis.
Results: In this study, the results showed significant improvement in the reduction of back pain and increase functional activities of daily living by postural awareness with an educational booklet among sweet-makers. The NPRS score in pair sample t-test before and after 15 days of postural awareness by booklet was the level of significant 0.000123, the mean of 0.640±0.700. The pattern of pain before and after 15 days of postural awareness by booklet was the level significant 0.042896 when the mean difference was -0.160±0.374. The referred pain before and after 15 days of postural awareness by booklet was 0.000032 level significant where the mean difference was -0.520±0.510.
Conclusions: The result of this study suggests that postural awareness through a booklet on back pain was effective and it also improves activities of daily living among sweet-makers.

Keywords: Back pain, Postural awareness, Sweet-makers, Pain

INTRODUCTION

Pain is a common reason for seeking medical treatment and is a significant source of human suffering and disability. Chronic pain, including chronic back pain, is a leading cause of years lived with disability (YLDs) worldwide. Chronic low back pain has been identified as the primary cause of YLDs, highlighting its prevalence and impact on individuals' quality of life. Other conditions such as chronic neck pain, migraine, and arthritis also contribute to YLDs. The recognition and classification of chronic pain as a health condition have been improving, emphasizing the need for effective interventions. [1]

Sweet-making is a popular industry found in many countries, particularly in Asia. In India and other Asian countries, the sweet-making sector is a significant part of the unorganized labour market and plays a crucial role in producing traditional and delicious sweet dishes.

However, workers in this sector often face challenges related to poor working postures, unsafe working environments, and heavy workloads. The majority of the workforce in India belongs to the unorganized sector, and they often experience adverse working conditions. The strenuous postures involved in sweet-making have been associated with work-related musculoskeletal disorders (WMSDs), which can lead to physiological risks and reduced productivity.[2]

Postural syndrome, characterized by pain resulting from sustained loading and relieved by posture correction, is often observed in the lumbar spine due to prolonged sitting. Chronic low back pain (CLBP) is a prevalent and costly musculoskeletal condition affecting a significant portion of the adult population. Home-based exercises and ergonomic advice have been provided to CLBP patients, demonstrating the potential for pain management. Alternative approaches such as Pilates, the MK approach, the Feldenkrais method, and back schools have also shown effectiveness in reducing pain and improving outcomes.[3]Ergonomic and psychosocial factors in the workplace can influence the development of low back pain (LBP) with disability. Work-related interventions targeting both ergonomic and psychosocial stress are essential in preventing and managing LBP. Studies conducted in different populations have indicated the importance of these factors in LBP onset and disability. Japanese workplaces should focus on comprehensive interventions addressing both ergonomic and psychosocial aspects to reduce the prevalence of LBP.[4]

Musculoskeletal disorders are a significant health concern among workers, particularly in industries with high ergonomic risks. Bakery workers are exposed to such risks, leading to an increased prevalence of musculoskeletal pain. Comprehensive intervention programs that consider physical and psychosocial factors should be implemented to prevent and manage musculoskeletal pain, thereby protecting workers and improving productivity.[5]

Back pain assessment instruments play a crucial role in evaluating back pain and associated risk factors. Back pain is a significant concern worldwide and leads to substantial economic and social costs. Valid and reproducible assessment tools are necessary for effectively addressing back pain. In Brazil, back pain was the leading cause of disability, resulting in significant economic losses. Similar economic burdens have been observed in developed countries like the United States.[6]

The working postures of sweet-makers have been found to be strenuous, resulting in discomfort and pain in various body regions such as the head, neck, shoulders, wrists, and back. The implementation of proper workstations is recommended to improve the working conditions and well-being of sweet-makers.[2] Musculoskeletal disorders, including nerve disorders, spondylosis, and soft tissue disorders, have been identified as significant risks among workers, emphasizing the importance of addressing ergonomic factors.[7] Dental professionals also experience high rates of musculoskeletal disorders, particularly in the neck, lower back, shoulders, and upper back.[8]

Postural syndrome, characterized by pain caused by prolonged postural stresses, can affect joint surfaces, muscles, and tendons. Correcting abnormal posture can alleviate the pain associated with the postural syndrome. Sustained postures and positions contribute to the development of this syndrome.[9] Providing educational programs on proper working postures and the effects of weight gain can help reduce the prevalence of musculoskeletal problems. Prioritizing the health and safety of workers, particularly in the food and drug sectors, is crucial for preventing and reducing these issues.[10]

Pain self-efficacy and fear of movement are important factors in understanding the relationship between pain and disability, particularly in chronic low back pain. Higher levels of pain self-efficacy are associated with lower levels of pain and disability, and cognitive behavioral interventions can improve self-efficacy ratings and outcomes in chronic low back pain.[11]

Objectives of this study is to explore socio-demographic (age, gender, educational status, occupation) characteristics of sweet-makers with back pain. To compare the rating of pain intensity before and after postural awareness by a booklet with the back pain among sweet-makers.

METHODS

A pre-test and post-test experimental study were conducted over the course of one year (from January 2021 to December 2022), employing standardized data collection methods, in the working population of sweet makers at a sweet factory in Dhaka city and Ulla Para Upazila in the Sirajganj district. Due to the limited number of participants and the large area to cover, the tasks were not easily accomplished. The study included 25 adult sweet makers based on inclusion criteria (adult age, both gender, having 5 years working experiences along with back pain) and exclusion criteria (back pain due to pathological or traumatic issues, under aged workers and mentally retard persons). Statistical analysis was performed using Microsoft office excel and a scientific calculator. The data was analyzed using statistical package for the social sciences (SPSS) 20 version to compute descriptive statistics, frequency distributions, and parametric tests such as paired samples statistics, paired samples correlations, pair sample test in pair difference, and Mann-Whitney test. The researcher calculated the mean and standard deviation of the variables and determined whether they significantly differed from the standard table values.

To gather data for the study, various data collection tools were employed. The researcher utilized the numeric pain

rating scale (NPRS) and the functional reading independence index scale (FRI). After obtaining consent from the sweet makers with back pain, the researcher collected information about their condition, including traumatic history, working hours, posture during work, previous treatment, and other relevant details. Pain levels were measured using the NPRS, and functional activities of daily living (ADL) were assessed for pain intensity using the FRI scale in both the pre-test (before postural awareness education with a booklet) and the post-test (after 15 days of postural awareness education with a booklet).

The whole process of this research project was done by following the Saic Collage of Medical Science and Technology afield by medical faculty of Dhaka University, the Bangladesh Medical Research Council (BMRC) guideline and World Health Organization (WHO) research guidelines. Before the beginning of data collection, the researcher obtained the permission ensuring the safety of the participants from the concerned authorities of the clinical setting and was allotted with a witness from the authority for the verification of the collected data. The researcher strictly maintained the confidentiality regarding participant's condition and treatments.

RESULTS

In this study, among 25 participants' male 24, female 1, mean age 40.76 years found 4% (n=1) participant was below 25 years old, 76% (n=19) participants were between 26-50 years and 20% (n=5) participants were more than 50 years old. In this study, I found 4% (n=1) participants worked below 7 hours a day, 40% (n=10) participants worked 8-12 hours a day and 56% (n=14) participants worked more than 12 hours in a day.

In standing, I found before the postural awareness among 25 participants, mild pain was 1 person with a good posture where no moderate pain and 2 people were in severe pain. Among the fair posture-maintained people there were 8 people with mild pain 12 was moderate pain and 1 was severe pain. There only 1 person was mild pain person in poor posture.

Table 1: Participant characteristics.

Variable	Number of participants (N)	Percentage (%)
Gender		
Male	24	96
Female	1	4
Participant age group (years)		
<25	1	4
26-50	19	76
>50	5	20
Working hours per day		
<7	1	4
8-12	10	40
12	14	56

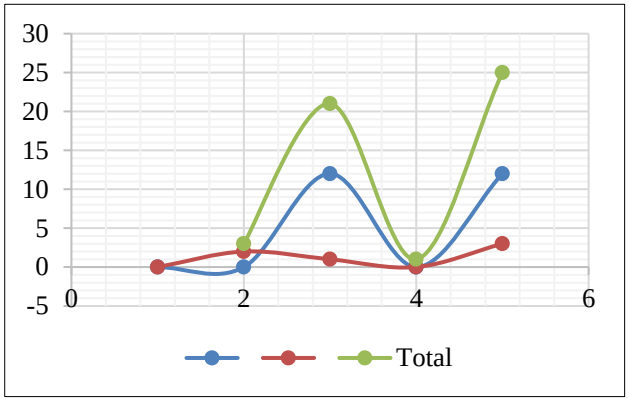

Figure 1: Pretest pain severity as measured by the NPRS scale in working posture.

Table 2: Working posture – standing.

Working posture	Severity of pain by NPRS scale in pretest			Total
	Mild pain (1-3)	Moderate pain (4-6)	Severe pain (7-10)	
Good	1	0	2	3
Fair	8	12	1	21
Poor	1	0	0	1
Total	10	12	3	25

NPRS: Numeric pain rating scale.

Table 3: Working posture seating.

Working posture	Severity of pain by NPRS scale in pretest			Total
	Mild pain (1-3)	Moderate pain (4-6)	Severe pain (7-10)	
Good	1	0	1	2
Fair	9	10	1	20
Poor	0	2	1	3
Total	10	12	3	25

In seating, I found before the postural awareness among 25 participants, the good posture maintained 1 person was in mild pain and 1 was in severe. There 9 persons were in mild pain, 10 persons were in moderate and 1 was in severe pain in fair posture. There 2 persons were in moderate pain and 1person was in severe pain with poor posture.

I found in this study the mean of pre-test severity of pain by NPRS scale was 2.72±0.678. The mean of post-test severity of pain by NPRS scale was 2.08±0.702. The mean of the pre-test pattern of pain was 1.76±0.436. The mean of a post-test pattern of pain was 1.92±0.277. The mean of pre-test referred pain was 1.44±0.507. The mean of post-test referred pain after the test was 1.96±0.200.

Table 4: Paired sample statistics of the provided information on outcomes.

Pair	Outcome	Mean± SD
Pair 1	Pre-test severity of pain	2.72±0.678
	Post-test severity of pain	2.08±0.702
Pair 2	Pre-test pattern of pain	1.76±0.436
	Post-test pattern of pain	1.92±0.277
Pair 3	Pre-test referred pain	1.44±0.507
	Post-test referred pain	1.96±0.200

The NPRS score in pair sample t-test before and after 15 days of postural awareness by booklet was the level of significant 0.000123, the mean was 0.640±0.700. The pattern of pain before and after 15 days of postural awareness by booklet was the level significant 0.042896 when mean was -0.160±0.374. The referred pain before and after 15 days of postural awareness by booklet was 0.000032 level significant where mean was -0.520±0.510.

Table 5: Pair sample calculated t-test results.

Pair	Mean± SD	t-value	Sig. (2-tailed)
Pre-test and post-test severity of pain by NPRS scale	0.640± 0.700	4.571	0.000123
Pre-test and post-test pattern of pain	-0.160± 0.374	-2.138	0.042896
Pre-test and post-test referred pain	-0.520± 0.510	-5.099	0.000032

The severity of pain by NPRS scale of Mann-Whitney U was 64.500, Wilcoxon W 130.500, Z -0.753 and Asymp. Sig.0.451, Exact Sig0.501[b].

The test statistics provide information about the Mann-Whitney U test conducted on the severity of pain by NPRS scale. It includes the Mann-Whitney U value, Wilcoxon W value, Z-score, asymptotic significance (2-tailed), and exact significance [2*(1-tailed Sig.)]. The grouping variable mentioned in the note is "Do you have referred pain?". The exact significance is indicated to not be corrected for ties (denoted as "b" in the table).

Table 6: Mann-Whitney Test.[18]

Test statistics	Value
Mann-Whitney U	64.500
Wilcoxon W	130.500
Z	-0.753
Asymp. sig. (2-tailed)	0.451
Exact sig. [2*(1-tailed sig.)]	0.501[b]

Table 7: The functional rating index scores.

ADL by FRI scale	Mean±SD
Pain intensity pre-test	1.40±0.707
Pain intensity post-test	0.60±0.764
Sleeping pre-test	0.84±1.028
Sleeping post-test	0.44±0.961
Personal care (washing, dressing etc.) pre-test	0.20±0.577
Personal care (washing, dressing etc.) post-test	0.16±0.473
Travel (driving etc.) pre-test	0.48±0.714
Travel (driving etc.) post-test	0.12±0.440
Work pre-test	1.32±0.627
Work post-test	0.60±0.707
Recreation pre-test	0.24±0.523
Recreation post-test	0.04±0.200
Frequency of pain pre-test	1.16±0.943
Frequency of pain post-test	0.36±0.757
Weight lifting pre-test	0.88±0.666
Weight lifting post-test	0.44±0.768
Walking pre-test	0.56±0.768
Walking post-test	0.16±0.374
Standing pre-test	0.92±0.759
Standing post-test	0.24±0.436

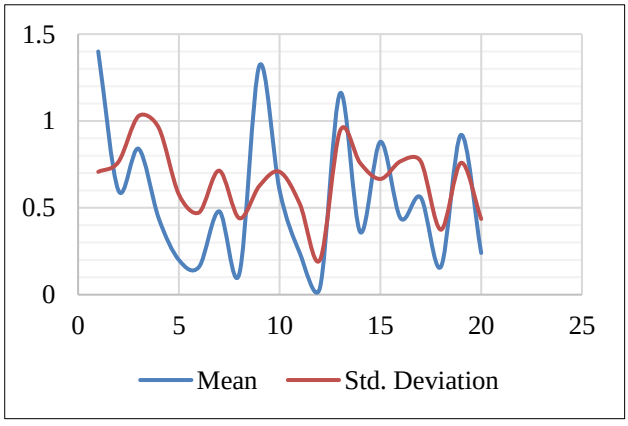

Figure 4: ADL to FRI ratio scores from the functional rating index.

DISCUSSION

The discussion highlights several key findings and observations from the research studies conducted on sweet makers and their association with musculoskeletal issues,

specifically back pain. Firstly, Sahu et al recommended the implementation of proper workstations to improve the well-being of sweet makers.[2] Their study emphasized the detrimental effects of strenuous postures on workers, leading to work-related musculoskeletal disorders (WMSDs) and decreased productivity.

Similarly, Hossain et al conducted a cross-sectional study among workers in the readymade garment (RMG) industry and found that lower back and neck pain were the most common issues.[12] They highlighted the importance of ergonomic interventions to address musculoskeletal risk factors and emphasized the need for research and policy changes to reduce exposure levels. Gender differences and working hours were also explored in relation to backache. Pradhan and Shrestha study found that female workers had longer working hours and were more prone to backache compared to male workers. They attributed this to the gender division of labor, with women taking on additional household responsibilities.[13]

The impact of chronic low back pain on individuals was investigated by Vieira et al. They discovered that low self-efficacy and high fear avoidance were associated with higher levels of disability. Their findings emphasized the importance of implementing targeted intervention strategies to address these beliefs and improve overall well-being.[14]

The relationship between postural syndrome and pain was studied by May et al. They found in this study in standing, before the postural awareness among 25 participants, mild pain 1person with a good posture where no moderate pain and 2 people were in severe pain. Among the fair posture-maintained people there were 8 people with mild pain 12 was moderate pain and 1 was severe pain.[15]

There only 1 person was mild pain person in poor posture. In seating, before the postural awareness among 25 participants, good posture was maintained 1 person was in mild pain and 1 was in severe. There 9 persons were in mild pain, 10 persons were in moderate and 1 was in severe pain in fair posture. There 2 persons were in moderate pain and 1person was in severe pain with poor posture.

The efficacy of interventions such as postural awareness through booklets and Reiki therapy was examined by Jaromi et al. In this study showed that pre-test pain severity means of 2.72±0.678 decreased in the post-test 2.08±0.702. Pre- and post-test patterns of pain also showed slight changes, as did referred pain. Statistical analyses indicated significant differences in pain levels before and after 15 days of postural awareness, based on VAS scores mean of 0.640±0.700, pain patterns -0.160±0.374, and referred pain -0.520±0.510.[16]

The severity of the ache and the ADL have measured through the use of visible analogue scale (VAS) pain and ADL–Instrumental ADL questionnaire before and after the intervention. A large distinction turned into discovered in pain intensity and ADL improvement between Reiki and drug therapy. There was no full-size distinction between Reiki and physiotherapy agencies in managing pain and improving ADL. Reiki and physiotherapy are effective strategies for managing aches and improving ADL in sufferers with IVDH.

According to Jahantiqh et al, Reiki was found to be a more cost-effective and faster treatment technique compared to physiotherapy. The study revealed that pain intensity, as measured by the FRI scale, decreased from a pre-test mean of 1.40±0.707 to a post-test mean of 0.60±0.764. Various activities such as sleeping, personal care, travel, work, recreation, frequency of pain, weight lifting, walking, and standing also showed improvements in post-test scores compared to their respective pre-test scores.[17]

Limitations

Time constraints resulted in data collection from only 25 out of 45 potential participants. The small sample size of 25 sweet-makers with back pain limits generalizability to a larger population. Monitoring activities of daily living (ADL) was not feasible during the study. The study only examined the short-term effects of postural awareness booklet, with no exploration of long-term effects. Limited availability of research in Bangladesh limited the study's access to relevant information and specific interventions for sweet-makers with back pain.

CONCLUSION

The pre-test post-test study found significant improvement in back pain and functional activities among sweet-makers through postural education using booklets, supporting the effectiveness of postural awareness. However, additional factors and treatments may influence outcomes.

Recommendations

As a consequence of this study is recommended to do further study including as real experimental as RCT. Because it was not to possible full investigation and diagnosis the condition about the back pain. It should need to long period of study. It also needs to assess the patriciates by specialist. There needs a big budget about the study. Postural awareness should be trained by a perfect workshop.

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