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Effectiveness of Behavioral and Lifestyle Changes in Reducing TMD Symptoms: Evidence from a Structured Intervention

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Abstract

Objective: To assess the effectiveness of behavioral measures in managing TMDs with an emphasis on pain, joint mobility and psychosocial status.

Methods: Forty-eight subjects with TMDs were enrolled based on the RDC/TMD criteria. Stress management, ergonomics training, dietary changes and stretching exercises were recommended as individualized lifestyle plans. The clinical, psychosocial and functional evaluations were done before and after three months of intervention.

Results: The frequency of myofascial pain without limited mouth opening was 45. 8% which was reduced to 20. The percentage of subjects with right and left TMJ arthralgia was also seen to have reduced significantly (70. 8% to 43. 7%, p = 0. 0133; 75% to 41. 6%, p = 0. 001). Right TMJ osteoarthrosis and osteoarthritis showed a considerable improvement (p < 0. 05) while the changes in the left TMJ were not significant. Disc displacement with reduction on the right and without reduction on the left side was also found to have improved markedly (p = 0. 036; p = 0. 041). Depression severity was also found to have reduced significantly with the normal levels increasing from 45. 8% to 83. 3% (p < 0. 05). Pain intensity as measured by VAS also reduced from 4. 72 ± 1. 44 to 3. 43 ± 1. 38 (p = 0. 001). There was also an enhancement in the non-specific physical symptoms but the differences were not statistically significant.

Conclusions: The present study demonstrated that the implementation of lifestyle modifications helps in decreasing the symptoms of TMD, increases the joint function and has a positive effect on the psychosocial status of the patients and therefore should be considered as the first-line treatment in the management of TMD.

Keywords: Stress management; Ergonomics; Dietary changes; Stretching exercises.

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Introduction

Temporomandibular disorders, or TMDs, are a group of diseases that affect the temporomandibular joint, masticatory muscles, and the other structures around it. TMDs are defined by pain, limited functionality, and auditory manifestations, including clicking or crepitus [1]. They are common in the international community with important consequences for oral health, quality of life, and health care expenses. Causes of TMD include occlusal irregularities, parafunctional habits, stress, and some systemic diseases [2]. However, non-invasive treatments are still the mainstay of managing these disorders even with the new pharmacological and surgical management [3].

Lifestyle changes have been identified as a way of managing TMDs, as they help manage the variables that can be altered [4]. Changes in behavior that include stress management, proper posture, changes in diet, and regular exercise have been seen to decrease muscle tension and

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improve the joint's flexibility, thus improving the overall health of patients [5]. These include relaxation techniques, ergonomic measures, and certain stretching and strengthening exercises for the TMJ and surrounding muscles that may be helpful in the management of symptoms in the long term [6].

Material and Methods

Study Design

A prospective interventional study was used to determine the efficacy of lifestyle changes in managing TMD. The study design involved 62 participants who were followed up for three months during which the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) was used to determine the diagnosis and intensity of the symptoms of the participants before and after the lifestyle changes. At the end of the assessment period, only 48 patients committed to the instructions, and all other uncommitted participants were excluded.

The inclusion criteria were as follows: adults between the ages of 18-60 years with primary TMD as per RDC/TMD, reporting at least one of the symptoms which include pain, joint sounds or limited jaw

This paper highlights the need to adopt a holistic view when managing TMDs, as evidenced by the relationship between lifestyle and TMJ health. Knowing which lifestyle factors may aggravate or reduce TMD symptoms will help patients and healthcare providers find the right direction for a noninvasive treatment. This research therefore seeks to assess the effectiveness of lifestyle function. The history of TMJ surgery, systemic diseases that affect the TMJ including rheumatoid arthritis, or concurrent medication or physical therapy for TMDs was excluded from the study.

Baseline Assessment:

1. Clinical Examination: The RDC/TMD Axis 1 protocol [7] involved a trained oral medicine specialist who conducted a structured procedure for assessing pain (through palpation), joint sounds like clicking or crepitus, and the range of motion of the mandible.

2. Symptom Severity: Pain intensity was measured using the Visual Analog Scale (VAS).

3. Psychosocial Assessment: RDC/TMD Axis II criteria were used to assess psychological distress and parafunctional habits.

Intervention:

alterations on TMJ health and their efficacy in decreasing TMD symptoms to suggest best practice for their application in the clinical setting. To enable individuals with TMDs to be more involved in the management of their condition and enhance their quality of life, this study seeks to encourage and support the implementation of cost-efficient measures.

All participants were given individualized lifestyle change guidelines that included the following: All participants received a written personalized lifestyle modification plan, including:

1. Stress management measures such as mindfulness, deep breathing, and meditation.

2. Ergonomic training with video record reference to teach participants correct posture.

3. Dietary changes that entail avoiding hard or chewy foods and using small bites during food chewing.

4. Exercises for the neck and TMJ region to be done regularly.

5. Sleep quality improvement.

The participants were then reassessed for myofascial pain using the same RDC/TMD criteria and scales three months after the intervention.

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Chi-square test and Fisher's exact test were used to test the differences between the records before and after intervention, which was significant at a level of a p-value < 0.05.

Results

As shown in table 1, initially, a large proportion of patients had myofascial pain without limited mouth opening (45.8%), which significantly decreased to 20.8% (p=0.0172). A reduction in number of right TMJ arthralgia cases also was recorded from 70.8% to 43.7% (p=0.0133), while left TMJ arthralgia decreased from 75% to 41.6% (p=0.001). Similar records were observed for right TMJ osteoarthrosis (68.7% to 45.8%) with significant difference (p<0.05) and right TMJ osteoarthritis, which also was significantly reduced in the second records (P-value <0.05). while the reductions in left TMJ osteoarthrosis and osteoarthritis were not statistically significant (P-value >0.05).

Table 1. TMD symptoms (RDC/TMD Axis I for patients before and after 3 months from intervention (* Chi-square test.

	Before intervention (n=48)	**After 3 months (n=48)**	**P-value**
Myofascial pain without limited mouth opening	22(45.8%)	10(20.8%)	0.0172*
Right TMJ Arthralgia	34(70.8%)	21(43.7%)	0.0133*
Left TMJ Arthralgia	36(75%)	20(41.6%)	0.001*
Right TMJ Osteoarthrosis	33(68.7)	22(45.8)	0.0107*
Left TMJ Osteoarthrosis	12(25%)	7(14.5%)	0.25*
Right TMJ Osteoarthritis	17(35.4%)	6(12.5%)	0.022*

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Left TMJ Osteoarthritis	18(37.5%)	6(12.5%)	0.317*
Right disc displacement with reduction	33(68.7)	18(37.5%)	0.036*
Right disc displacement without reduction	12(25%)	6(12.5%)	0.157*
Left disc displacement with reduction	22(45.8)	13(27%)	0.128*
Left disc displacement without reduction	20(41.6%)	9(18.7%)	0.041*

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Table 2. RDC/TMD Axis II levels of depression and non-specific physical symptoms for patients before and after 3 months of intervention (*Chi-square test, **Fisher's exact test).

	Depression		P-value	Non-specific physical symptoms		P-value
	Initial records n=48	After 3 months n=48		Initial records n=48	After 3 months n=48	
Normal	22(45.8)	40(83.3%)	0.022*	26	30	0.596*
Moderate	16(33.3%)	6(12.5%)	0.033*	13	12	0.841*
Severe	10(20.8%)	2(4.2%)	0.016**	9	6	0.439*

Table 3. Visual Analogue Scale before and after intervention (Paired t-test).

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	n	VAS Mean (SD)	P-value
Before treatment	48	4.72 (1.44)	0.001*
After treatment	48	3.43 (1.38)	

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For disc displacement conditions there was a notable change. The number of patients with right disc displacement with reduction declined from 68.7% to 37.5% (p=0.036), while the number with left disc displacement without reduction decreased significantly too (41.6% to 18.7%, p=0.041).

Depression levels also showed improvement, the percentage of participants with normal levels increased significantly from 45.8% to 83.3% (P-value < 0.05). Moderate and severe depression ratios showed significant reductions too (P-value < 0.05). Although there were slight improvements in non-specific physical symptoms, changes were not statistically significant across severity levels (e.g., severe symptoms reduced slightly from 9 to 6 participants, p=0.439) (Table2).

As in Table 3, pain intensity measured by VAS scores significantly decreased from a mean of 4.72 (±1.44) before treatment to 3.43 (±1.38) in the final record (p=0.001).

Discussion

The results of this research also show that there are huge advantages of lifestyle changes in managing symptoms and clinical diagnoses of temporomandibular joint disorder. TMJ disorders are acute and chronic pain, dysfunction and structural changes of the joint which are often complicated for the patient and the healthcare giver. It shows that focusing on the factors that can be changed can help to decrease the symptoms and increase the quality of life of the patient.

The best result was the enhancement of TMJ-related diagnosis after the intervention. Some of the diseases that were observed include myofascial pain, arthralgia and osteoarthrosis which revealed a decrease especially on the right side. These changes depict that non-invasive measures can also be used in the management of not only muscular aches but also joint dysfunctions [8]. The reduction in osteoarthritis severity also supports the notion that lifestyle changes may help in lessening degenerative processes which may include reduction of joint stress and inflammation [9]. However, there were no significant changes in some of the conditions on the left side suggesting possibly different responses which could be attributed by factors such as the asymmetry of TMJ loading or differing ability of individuals to adapt to the intervention.

About disc displacement conditions, the improvements seen point to the potential of behavioral changes to enhance joint dynamics. Changes in parafunctional habits and mandibular positioning using stress management, posture alignment, and dietary changes may be useful in the restoration of disc positioning and

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enhancement of joint stability [10]. These results also support the notion that the management of TMJ disorders should encompass the treatment of the biomechanical and behavioral factors that lead to the condition, in an addition to other noninvasive types of management like sleep quality improvement and diet habit correction [11,12].

Pain and psychological well-being were also found to have improved markedly after the intervention. The reduction in pain intensity is very promising especially because pain is a major factor that affects the quality of life of people with TMJ disorders [13]. The decrease in depressive symptoms also supports the link between psychological health and pain. Some of the lifestyle changes that are recommended also help in reducing stress and thus have the potential of improving the physical wellbeing of an individual and the mental health as well. This is an important finding because mood disorders are known to worsen the TMD and may interfere with the treatment process [14].

However, the changes in the non-specific physical symptoms were not statistically significant therefore suggesting that these changes might not have been significant or consistent within the study sample. This shows that there is still a need to explore more about these symptoms and how they are related to TMD. Further research could also examine whether longer durations of intervention or more individualized management plans may produce better results in this regard.

The findings of this study support the need to take a systemic approach when managing TMJ disorders. Many surgical and pharmacological strategies were tested in previous research for the management of TMD [15-17]. This paper shows that behavioral, lifestyle and dietary changes can be as effective as pharmacological and surgical interventions but at a cheaper and with no side effects [18-20]. Modifying these behavioral, postural and dietary factors can help manage the various symptoms of TMDs therefore offering a complete management plan [21-23]. This implies that there could be differences in the response rates based on the diagnosis and the symptom profiles hence possibly needing tailored treatment plans to enhance the best results.

Conclusion

This research shows that implementing lifestyle changes is an effective way of enhancing the TMJ and thus reducing the severity of TMDs. The reduction of pain, psychological distress and the pathologies of the TMJ demonstrates the effectiveness of these interventions to

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improve the quality of life of the sufferers. Further research should also entail the enhancement of these measures, the evaluation of their maintenance over time and the assessment of the results in different people and environments.

Availability of data

Data are available on request to the corresponding author.

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Conflicts of interest

There are no conflicts of interest.

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