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Effect of nursing management on improving manifestations of patients with temporomandibular joint disorders

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Abstract
The temporomandibular joint disorders concerns an heterogeneous group of pathologies that manifest in the orofacial region, head and neck, and result from the dysfunctional interrelationship between temporomandibular joints, masticatory and cervical muscles, teeth and dental tissues as well as the central and peripheral nervous systems.
Aim: To evaluate the effect of nursing management on improving manifestations of patients with temporomandibular joint disorders.
Research design: Pre/post-test research design was utilized on 50 adult patients.
Setting: The study was conducted in the maxillofacial surgery outpatient clinic at Assiut University Hospital.
Tools: Structured questionnaire sheet & Temporomandibular Joint Disorder Questionnaire Assessment.
Results: About half of the sample of the study group their age range between 18-29 years old, with mean of (29.12±9.82) and about three quarter of the study group were females. There is statistically significant difference for the study group regarding pain symptoms pre / post 4 weeks after implementation of the nursing management.
Conclusion: It was concluded that conservative management including counseling, self-care, exercises, occlusal splint therapy, and massage are considered as the first choice treatment for temporomandibular joint disorders and the majority of temporomandibular joint disorders patients can be successfully treated safely.
Recommendations: Pamphlets and simple illustration booklets should be available for patients to provide them with simple explanation about conservative management to maintain normal temporomandibular joint function.

Keywords: disorders, joint, nursing, management, manifestations, temporomandibular

Introduction

The temporomandibular joint (TMJ) is one of the most important and complex joints in the body which provides the articulation between the movable mandible and the fixed temporal bone of the cranium. The TMJs are bilateral, diarthrodial, ginglymoid, synovial, and freely movable. The term diarthrodial is used because the joint has two articular bone components, the mandibular condyle inferiorly and the articular eminence and glenoid fossa of the temporal bone superiorly. The term ginglymoid is used because the joint has a hinge-like movement component. The joint is lined by the synovial membrane and is freely movable (David & Elavarasi *et al*., 2016) [9].

The American Academy of Orofacial Pain defined temporomandibular joint disorders (TMJDs) as a group of musculoskeletal and neuromuscular conditions that involve the TMJs, the masticatory muscles and all associated structures in reciprocal interaction and influence (Leeuw & Klasser, 2013) [29].

The etiology of TMJDs is not fully understood and is related to the presence of risk factors such as trauma, para-functional habits, postural condition, occlusal micro-trauma, systemic predisposition, sleep disorders, and deleterious psychosocial alterations. The diagnosis of TMJDs is achieved by evaluating the medical history and by physical examination (Hunter & Kalathingal, 2013) [21].

Common symptoms of TMJ disorders may affect one or both jaw joints include one or more of the following; headache of moderate to severe intensity are often the first and most common symptom of TMJ disorders. Headaches may occur on both sides or affect only one side of the head. The common areas affected are the temples, forehead, behind the eye, and/or around the ear (Nilsson *et al*., 2013) [36]. Tenderness in the scalp and forehead muscles is also common. Pain in the jaw muscles, face, sinuses, neck, and/or shoulders may present. Ear symptoms including pain, ringing, pressure and/or congestion in the ears. Jaw symptoms including clicking, popping, and/or grating sounds while opening and closing the mouth; limited jaw opening, and pain in the TMJ, improper bite or inability to bring the teeth together. Also, TMJ disorders may cause disturbed sleep, dizziness, or vision problems in some people. Jaw sounds without associated pain or other TMJ disorders symptoms may not always indicate a TMJ disorders, and mostly

go away on their own (Caldas *et al*., 2016) [5].
Diagnostic imaging methods of TMJ are used to assess the integrity of its components and their functional association, to confirm the extent or progression of an existing disease, and to assess and document the effects of an already established treatment. They are essential for assessment in cases of trauma, occlusal alterations and sudden limitation of mouth opening, presence of joint noises, systemic joint diseases, infection and failure of conservative treatments (Ferreira *et al*., 2016) [15].
Management of temporomandibular joint (TMJ) disorders aims at addressing the underlying cause of the disorder, reduce pain as pain represents the main reason for medical seek and/or to restore normal function of the lower jaw or mandible. Non-surgical treatments are considered first and may have positive results in treating TMJ disorders (Gil-Martínez *et al*., 2018) [16].
Applying moist heat over the TMJ may help improve function and reduce pain. Cold packs help reduce swelling by constricting small blood vessels and decrease inflammation. Cold and/or heat therapy is limited to 15 or 20 minutes at a time with at least a 2-hour break in between applications to reduce the risk for a skin injury. Eating soft or mashed foods helps avoid the need for biting and chewing, which helps reduce the load on the TMJ. Avoid activities or habits that may worsen TMJ disorders, such as chewing gum, clenching the jaw, and cradling the phone between the ear and the shoulder, which may irritate the muscles of the jaw and neck (Dimitroulis, 2018) [10].
While at rest, maintaining a correct jaw posture is essential for creating a harmony between the lips, face and jaw muscles, teeth, and tongue. Using the fist to support the chin while yawning may help prevent the jaw from locking. Sleeping on the side with a pillow to support the neck and shoulder may help prevent stretching the jaw and neck muscles. Relaxation techniques such as Yoga, massage, meditation, guided imagery, and/or slow and deep breathing exercises may be useful in calming TMJ disorders pain (Dimitroulis, 2018) [10].

2. Significance of the study
Temporomandibular joint disorders (TMJDs) are one of the common disorders in the maxillofacial region. From the researcher's clinical experience in the surgical unit it was observed that the patients who complain from TMJDs need special nursing management to improve patients' manifestations so this study will be conducted to help in care of patients with TMJDs.

3. Aim of the study
To evaluate the effect of nursing management on improving manifestations of patients with TMJDs.

4. Research Hypothesis
The studied group of patients will have fewer manifestations after application of the nursing management than before application of it.

5. Subjects and methods
5.1. Research design
Pre / post-test research design was utilized in this study.

Technical design

5.2. Setting
The study was conducted in the maxillofacial surgery outpatient clinic at Assiut University Hospital.

5.3. Subjects
Sample of 50 adult patients of both sexes in maxillofacial surgery outpatient clinic at Assiut University Hospital, age ranges from 18 to 65 years old. The sample size was calculated statistically by power analysis according to the patients flow with precision levels 5% at confidence levels 95% & $P< 0.05$.

5.4. Tools
Two tools were utilized to collect data for this study
Tool (1): A structured questionnaire sheet: to assess demographic data and patient's medical data developed by the researcher based on literature review.

This tool consists of three parts
Part (1): Demographic data for patients as (age, gender and level of education……etc.).

Part (2): Patient's medical data: the presence of trauma, previous surgery (dental implants and open reduction internal fixation), and/or repetitive trauma, migraine, headaches, earaches or tinnitus, fibromyalgia, osteoarthritis, rheumatoid arthritis …etc.).

Part (3): Factors associated with TMJDs: as occlusal factors, psychological factors, parafunctional habits, malocclusion and trauma.

Tool (I2): Temporomandibular Joint Disorders (TMJ/TMDs) Questionnaire Assessment adopted by (Cramin, 2014) [8] used to assess TMJDs manifestations, it consists of 3 parts such as (pain symptoms, dysfunction, miscellaneous and associated complaints). It was done pre implementation of the nursing management during 1st interview at maxillofacial surgery outpatient clinic and after 4 weeks from 1st interview post implementation of the nursing management.

Scoring System: for Temporomandibular Joint Disorders (TMJ/TMDs) Questionnaire Assessment which consist of 3 parts. As regard pain symptoms which included 16 items, 15 items were observed, categorized and scored into either Rt. = 1, Lt. = 2, Both = 3 or None = 4 on all items. While the item number 16 that contain 12 steps was observed, categorized and scored into either Yes = 1or No = 0.
While as regard universal pain assessment tool using 0-10 scale for patient self-assessment was observed, categorized and scored into either 0=No pain, 1-3=Mild pain, 4-6=Moderate pain, 7-9=Severe pain or 10=Worst pain. The remaining 6 questions about pain characteristics were observed, categorized and scored into either Yes =1or No =0 on all items.
As regard dysfunction which included 5 items, 1st item was observed, categorized and scored into either Normally= 1, Partially= 2 or almost not at all= 3.While for 2 & 5 items were observed, categorized and scored into either Yes = 1or No = 0. Item number 3 was observed, categorized and scored into either Rt. = 1, Lt. = 2, both = 3 or none = 4. Item number 4 was

observed, categorized and scored into either Frequent= 1, Occasional= 2 or none= 3.
As regard miscellaneous and associated complaints which included 13 items, each item was observed, categorized and scored into either Yes =1or No =0 on all items.

Procedure: The study was carried out on three phases:

The preparatory phase
Preparation of tools for data collection and teaching management was done during this phase. It was reviewed by a 5 panel of medical-surgical nursing and medical experts. To facilitate the implementation of the teaching protocol, researcher prepared the teaching places, teaching aids and media (pictures and handouts). This was followed by arranging for the teaching management schedule based on the contents of protocol, number of patients and time availability.

Tools development
The researchers developed the study tools after extensive review of relevant literature. Modifications were made accordingly, and then the tools were designed in their final format and tested for reliability.

Administrative approval
An official approval and administration permission were obtained from the head of the maxillofacial surgery unit to collect the necessary data, and the purpose of the study was explained.

A pilot study
- A pilot study on (10%) 5 patients was conducted during April 2018 in order to test the clarity and applicability of the tools. According to this pilot study, the required modifications were made. Those patients who were involved in the pilot study weren't included in the study.
- Data collection covered a period of 6 months starting from April 2018 till the end of November 2018.

Implementation phase
During admission
- Each patient was interviewed individually after receiving medical management.
- Each patient was asked to answer interview questionnaire sheet. Initial assessment of temporomandibular joint disorder was done and recorded

The nursing management sessions
The nursing management had been implemented for the study group in term of sessions. The nursing management sessions aimed to evaluate the effect of nursing management on improving manifestations of patients with TMJDs. The educational protocol was developed by the researchers based on the review of relevant literature and available resources. There were a total three sessions were conducted for each patients, each session ranged between (15-20) minutes.
Each session usually started by a summary of what had been taught during the previous session and the objectives of the new session. After each session there was 10 minutes for discussion and gave feedback. Reinforcement of teaching was performed according to patient's needs to ensure their understanding. Each patient in the study group obtains a copy of the teaching booklet.

The researcher used pictures for illustration, and diagram to Educate the patient.

The first session: Was started during 1st interview at maxillofacial surgery outpatient clinic, it contains two parts:

Part I: Information about TMJ and TMJDs as definition, function, etiology, clinical manifestations of TMJDs.

Part II: Home self-care instructions with modified diet; load reduction on the TMJ is achieved by modifying the patient's diet to reduce joint loading from forces of mastication. This is achieved primarily by a non-chewing diet such as liquid or pureed food. As the joint pain improves, the diet may be advanced.

The second session: was started immediately after 1st session and it contains two parts

Part I: Instructions about habits modification; about oral par functional muscle tension produced by habits such as teeth clenching, jaw thrust, gum chewing, jaw tensing and poor positioning of the head, neck, or tongue.

Part II: Instructions about jaw exercises and massage; includes stretch and/ or range of motion exercises, massage and moist warm towels on sensitive areas for 10-15 minutes can decrease sensitivity, pain, increase the range of mandibular movements and relaxes muscles and the use of maxillomandibular appliances (night guard).

The third session: was started after 2nd session, it contains patient education and stress control; successful management lies in awareness, patient motivation and cooperation. In stressful situations, patients were instructed to utilize stress management techniques to prevent unproductive tensing of jaw, face and neck muscles.

Evaluation phase

The last phase of proposed nursing management is the evaluation phase. In which the patients was evaluated after 4 weeks from 1st interview post implementation of the nursing management.

Ethical consideration

The study was approved by an institutional ethics committee. An oral consent was obtained from patients to participate in the study after explanation the purpose of the study to them. The patients were informed that participation is voluntary and they could withdraw at any time of the study.

Statistical analysis

The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by number and percent (N, %), where continuous variables described by mean and standard deviation (Mean, SD). Chi-square test and fisher exact test used to compare between categorical variables where compare between continuous variables by t-test. A two-tailed $p < 0.05$ was considered statistically significant. All analyses were performed with the IBM SPSS 20.0 software.

6. Results

Table 1: Frequency distribution of demographic characteristics for studied patients (n=50).

Variables	No.	%
Age by years		
18-29 years	27	54.0
30-39 years	17	34.0
40-49 years	3	6.0
50-65 years	3	6.0
Mean ±SD	29.12±9.82	
Gender		
Male	14	28.0
Female	36	72.0
Marital status		
Single	27	54.0
Married	20	40.0
Widow	3	6.0
Level of education		
Illiterate	7	14.0
Read and write	4	8.0
Primary school	1	2.0
Preparatory school	5	10.0
Secondary school	18	36.0
University	15	30.0
Occupation		
Unemployed	10	20.0
Housewife	15	30.0
Student	13	26.0
Employer	12	24.0

Table 2: Distribution of the sample according to medical data for the study group (n = 50)

Variables	Yes		No	
	N	%	N	%
1. Presence of trauma				
▪ Motor car accident	3	6.0	47	94.0
▪ Bicycle accident	---	----	50	100.0
▪ Quarrel problems	2	4.0	48	96.0
▪ Assault	----	---	50	100.0
▪ Athletic trauma	----	---	50	100.0
2. Repetitive trauma	----	---	50	100.0
3. Previous surgery				
▪ Dental implants	6	12.0	44	88.0
▪ Open reduction internal fixation	3	6.0	47	94.0
4. Earaches	5	10.0	45	90.0
5. Tinnitus	2	4.0	48	96.0
6. Headaches	31	62.0	19	38.0
7. Migraines	3	6.0	47	94.0
8. Dizziness	8	16.0	42	84.0
9. Fibromyalgia	2	4.0	48	96.0
10. Osteoarthritis	5	10.0	45	90.0
11. Muscles pain	16	32.0	34	68.0
12. Hearing changes	1	2.0	49	98.0
13. Neck ache	2	4.0	48	96.0
14. Bone pain	12	24.0	38	76.0
15. Ulcers	3	6.0	47	94.0
16. Sensitive teeth	28	56.0	22	44.0
17. Periodontal disease	25	50.0	25	50.0
18. Rheumatoid arthritis	------	------	50	100.0
19. Trouble sleeping	33	66.0	17	34.0

Table 3: Frequency distribution of factors associated with TMJDs for studied patients (n=50).

Variables	NO.	%
Occlusal factors	20	40%
Psychological factors	37	74%
Parafunctional habits	30	60%
Malocclusion	5	10%
Trauma	8	16%

Table 4: Distribution of the sample according to pain symptoms after implementation of the nursing management pre / post 4 weeks for the study group (n = 50).

Pain symptoms	Pre								Post 4 weeks								P.V
	Rt.		Lt.		Both		None		Rt.		Lt.		Both		None		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
1. Pain in joint	23	46.0	11	22.0	14	28.0	2	4.0	8	16.0	9	18.0	7	14.0	26	52.0	.001**
2. Pain in ear	7	14.0	3	6.0	5	10.0	35	70.0	1	2.0	2	4.0	4	8.0	43	86.0	.131ns
3. Pain around eyes	5	10.0	2	4.0	2	4.0	41	82.0	0	0.0	1	2.0	1	2.0	48	96.0	.102ns
4. Pain in lower jaw	8	16.0	7	14.0	7	14.0	28	56.0	3	6.0	1	2.0	2	4.0	44	88.0	.004**
5. Pain in upper jaw	1	2.0	0	0.0	1	2.0	48	96.0	0	0.0	0	0.0	0	0.0	50	100.0	.360ns
6. Pain in neck	2	4.0	0	0.0	0	0.0	48	96.0	0	0.0	0	0.0	0	0.0	50	100.0	.247ns
7. Pain in shoulder	3	6.0	1	2.0	0	0.0	46	92.0	0	0.0	0	0.0	0	0.0	50	100.0	.125ns
8. Pain in forehead	3	6.0	1	2.0	7	14.0	39	78.0	0	0.0	0	0.0	0	0.0	50	100.0	.006**
9. Pain in facial area	7	14.0	2	4.0	5	10.0	36	72.0	2	4.0	1	2.0	0	0.0	47	94.0	.023*
10. Click sound in joint	14	28.0	5	10.0	7	14.0	24	48.0	8	16.0	2	4.0	2	4.0	38	76.0	.031*
11. Subjective hearing loss	2	4.0	0	0.0	2	4.0	46	92.0	0	0.0	1	2.0	0	0.0	49	98.0	.165ns
12. Ringing sound in ears (tinnitus)	6	12.0	5	10.0	4	8.0	35	70.0	1	2.0	1	2.0	1	2.0	47	94.0	.020*
13. Headache	21	42.0	6	12.0	14	28.0	9	18.0	3	6.0	4	8.0	7	14.0	36	72.0	.001**
14. Fullness, pressure blockage in ear	8	16.0	4	8.0	2	4.0	36	72.0	0	0.0	0	0.0	1	2.0	49	98.0	.002**
15. Pain in tongue	0	0.0	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	0	0.0	50	100.0	-----

Chi-Square Tests *=Significant difference *p≤0.05 **= highly significance *p≤0.01 Ns= Non-significant difference P>0.05

Table 5: Distribution of the sample according to normal daily activities cause pain symptoms after implementation of the nursing management pre / post 4 weeks for the study group (n = 50).

Normal daily activities	Pre				Post				P.V
	Yes		No		Yes		No		
	N	%	N	%	N	%	N	%	
1. Yawning	41	82.0	9	18.0	9	18.0	41	82.0	.001**
2. Chewing	49	98.0	1	2.0	20	40.0	30	60.0	.001**
3. Swallowing	10	20.0	40	80.0	2	4.0	48	96.0	.014*
4. Speaking	22	44.0	28	56.0	1	2.0	49	98.0	.001**
5. Singing	2	4.0	48	96.0	0	0.0	50	100.0	.247ns
6. Shouting	39	78.0	11	22.0	16	32.0	34	68.0	.001**
7. Brushing	19	38.0	31	62.0	1	2.0	49	98.0	.001**
8. Moving head	8	16.0	42	84.0	0	0.0	50	100.0	.003**
9. Moving neck	6	12.0	44	88.0	0	0.0	50	100.0	.013*
10. Moving shoulders	4	8.0	46	92.0	1	2.0	49	98.0	.181ns
11. Moving arms	2	4.0	48	96.0	0	0.0	50	100.0	0.500ns
12. Moving trunk	0	0.0	50	100.0	0	0.0	0	100.0	-----

Chi-Square Tests *=Significant difference *p≤0.05 **= highly significance*p≤0.01 Ns= Non-significant difference P>0.0

Table 6: Comparison of universal pain assessment and characteristics of pain for the study group pre / post 4 weeks after implementation of the nursing management (n = 50).

Variables	Pre-test		Post-test		P.V
	N	%	N	%	
I- Universal pain assessment:					
▪ No pain	1	2.0	21	42.0	
▪ Mild pain	8	16.0	20	40.0	
▪ Moderate pain	25	50.0	8	16.0	0.001**
▪ Sever pain	15	30.0	1	2.0	
▪ Worst pain	1	2.0	0	0.0	
II- Characteristics of pain:					
1. Kinds of pain:					

▪ Sharp	34	68.0	4	8.0	0.001**
▪ Superficial	19	38.0	16	32.0	.338ns
▪ Aching	48	96.0	9	18.0	0.001**
▪ Burning	2	8.0	0	0.0	.247ns
▪ Dull	13	26.0	17	34.0	.257ns
▪ Deep	27	54.0	6	12.0	0.001**
▪ Pulsating	6	12.0	5	10.0	.500ns
▪ Spreading	22	44.0	3	6.0	001**
2. When is the pain worse:					
▪ Mornings	4	8.0	0	0.0	.059*
▪ Evenings	3	6.0	0	0.0	.121ns
▪ At Meals	24	48.0	13	26.0	.019*
▪ No Specific Time	20	40.0	16	32.0	.266ns
1. Is the pain constant?	16	32.0	2	4.0	.001**
2. Is the pain Intermittent?	33	66.0	27	54.0	.154
3. Pain last for:					
▪ A moment	0	0.0	8	16.0	.003**
▪ Minutes	19	38.0	16	32.0	.338ns
▪ Hours	21	42.0	4	8.0	.001**
▪ All day	9	18.0	1	2.0	.008**
4. Pain start suddenly.	34	68.0	17	34.0	.001**
5. Pain start gradually.	15	30.0	12	24.0	.326
6. Pain stop suddenly.	3	6.0	7	14.0	.159
7. Pain stop gradually.	45	90.0	22	44.0	.001**

Chi-Square Tests *=Significant difference *p≤0.05 **= highly significance
*p≤0.01 Ns= Non-significant difference P>0.05

Table 7: Distribution of study group as regard dysfunction pre / post 4 weeks after implementation of the nursing management (n = 50).

Dysfunction	Pre		Post		P.V
	N	%	N	%	
1. Can you open your mouth:					
▪ Normally	41	82.0	47	94.0	.061ns
▪ Partially	9	18.0	3	6.0	
▪ Almost not at all	0	0.0	0	0.0	
2. You ever open so wide your mouth locks open:					
▪ Yes	4	8.0	2	4.0	.339ns
▪ No	46	92.0	48	96.0	
3. Do you have clicking sound in the joint:					
▪ Clicking right	13	26.0	8	16.0	
▪ Clicking left	5	10.0	3	6.0	.079ns
▪ Clicking both	7	14.0	2	4.0	
▪ None	25	50.0	37	74.0	
4. Do you have popping sound in the joint**:**					
▪ Popping right	3	6.0	0	0.0	
▪ Popping left	3	6.0	0	0.0	.041*
▪ Both	0	0.0	0	0.0	
▪ None	44	88.0	50	100.0	
5. If you have any of these sounds is it occurrence?					
▪ Frequent	17	34.0	4	8.0	
▪ Occasional	12	24.0	10	20.0	.006**
▪ None	21	42.0	36	72.0	
6. Have you noticed any change in your bite?					
▪ Yes	4	8.0	4	8.0	.643ns
▪ No	46	92.0	46	92.0	

Chi-Square Tests *=Significant difference *p≤0.05 **= highly significance
*p≤0.01 Ns= Non-significant difference P>0.05

Table 8: Frequency distribution of study group as regard miscellaneous and associated complaints and questions pre / post 4 weeks after implementation of the nursing management (n = 50).

Variables	Pre				Post				P.V
	Yes		No		Yes		No		
	N	%	N	%	N	%	N	%	
1. Are your jaw muscles ever tired?	40	80.0	10	20.0	14	28.0	36	72.0	.001**
2. Do you have a jaw thrust habit or nervous twitch about the face (tic)?	26	52.0	24	48.0	15	30.0	35	70.0	.021*
3. Does your face swell?	12	24.0	38	76.0	3	6.0	47	94.0	.011*
4. Have you ever noticed production of more saliva or less saliva?	4	8.0	46	92.0	0	0.0	50	100.0	.059*
5. Do tears form in your eyes for no apparent reason?	1	2.0	49	98.0	0	0.0	50	100.0	.500ns
6. Did the symptoms start after any of the following conditions? (*Check if yes)*									
▪ Severe emotional upset	33	66.0	17	43.0	25	50.0	25	50.0	.078ns
▪ A blow on the jaw	12	24.0	38	76.0	3	6.0	47	94.0	.011*
▪ Excessively large bite	40	80.0	10	20.0	11	22.0	39	78.0	.001**
▪ Moving jaw forward or to the side	14	28.0	36	27.0	6	12.0	44	88.0	.039*
▪ Chewing hard food	49	98.0	1	2.0	19	38.0	31	62.0	.001**
7. Have you had cortisone injected into the joint?	9	18.0	41	82.0	5	10.0	45	90.0	.194ns
8. Have you had recent dental treatment?	22	44.0	28	56.0	3	6.0	47	94.0	.001**
9. Have you had orthodontia?	4	8.0	46	92.0	2	4.0	48	96.0	.339ns
10. Have you had your bit adjusted by your dentist?	1	2.0	49	98.0	0	0.0	50	100.0	.500ns
11. Do you clench your teeth?	31	62.0	19	28.0	9	18.0	41	82.0	.001**
12. Has anyone mentioned that you grind your teeth (bruxism) at night during sleep?	12	24.0	38	76.0	5	10.0	45	90.0	.054*
13. Do you chew gum? (*Check if yes)*									
▪ Frequently	23	46.0	27	54.0	0	0.0	50.0	100.0	.001**
▪ Moderately	16	32.0	34	68.0	2	4.0	48	96.0	.001**
▪ Infrequently	9	18.0	41	82.0	2	4.0	48	96.0	.026**
▪ Never	2	4.0	48	96.0	46	92.0	4	8.0	.001**

*Chi-Square Tests *=Significant difference *p≤0.05 **= highly significance*p≤0.01 Ns= Non-significant difference P>0.05*

Table (1): This table reveals that, about half of the sample of the study group their age range between 18-29 years old, with mean of (29.12±9.82) and about three quarter of the study group were females 72.0%, single 54.0%, have secondary school 36.0% and housewife 30.0%.

Table (2): This table shows that, about more than half of the study group have headache, sensitive teeth, periodontal disease and trouble sleeping (62%, 56%, 50%, and 66%) respectively.

Table (3): This table illustrates that, psychological factors followed by parafunctional habits and occlusal factors are present the highest percent of risk factors causing TMJD (74%, 60% and 40%) respectively.

Table (4): This table illustrates that, there is statistically significant difference for the study group regarding pain symptoms (joint, lower jaw, forehead, facial area, click sound in joint, ringing sound in ears, headache and fullness or pressure in ear) pre / post 4 weeks after implementation of the nursing management.

Table (5): This table demonstrates that, there are statistically significant differences for the study group regarding normal daily activities cause pain symptoms in all items except singing, moving shoulders and moving arms pre / post 4 weeks for the study group after implementation of the nursing management.

Table (6): This table shows that, there are statistically significant differences for the study group regarding universal pain assessment pre / post 4 weeks for the study group after implementation of the nursing management and there are statistically significant differences regarding characteristics of pain about kinds of pain (sharp, aching, deep and spreading), worsening of pain (morning and at meals), duration of pain (constant and lasts for a moment, hours or all day) and the pain start suddenly and stop gradually pre / post 4 weeks for the study group after implementation of the nursing management.

Table (7): This table shows that, there are statistically significant differences for the study group regarding dysfunction about sound in joint (popping) and it is occurrence pre / post 4 weeks for the study group after implementation of the nursing management.

Table (8): This table shows that, there are statistically significant differences for the study group as regard miscellaneous and associated complaints and questions in all items except do tears form in your eyes for no apparent reason?, severe emotional upset, have you had cortisone injected into the joint?, have you had orthodontia?, have you had your bit adjusted by your dentist?, pre / post 4 weeks for the study group after implementation of the nursing management.

7. Discussion

Regarding demographic characteristics of the patients; the present study clarified that, maximum percentage of patients with TMJ disorders was between the age ranges of 18–29 years old. This finding consistent with (Al Shaban & Gul Abdul Waheed, 2018) [2] who revealed that, maximum percentage of patients was between the age ranges of 19–29 years old. In disagreement with (Bonjardim *et al*., 2009, Macfarlane *et al*., 2009, Ingawalé & Goswami, 2009, Marklund & Wänman, 2010 and Yekkalam & Wänman, 2014) [4, 31, 43] who have demonstrated that, the frequency of TMJDs symptoms varies with age, as it increased greatly between 20-40 years and in adolescents, then declined after 50 years of age while (Pimentel *et al*., 2008) [39] observed an increasing characteristic until the age group 30 to 44 years old.

Also the incidence of female was more than male regarding TMJ disorders which are consistent with most of the studies

(Ebrahimi *et al*., 2011, Bahrani *et al*., 2012, Fernandes *et al*., 2016 & Murad *et al*., 2016) [11, 3, 13, 35] which have shown clearly the predominance of the female with TMJ disorders.

Also (Hirsch *et al*., 2012) [20] who reported in their study, the predominance of the female with TMJ disorders during pubertal development, but the diagnosis remains unknown and more researches are needed to try to demonstrate the relationship between female hormones and TMJ disorders (cause and effect). While according to (Kim *et al*., 2012) [27], there is a tendency of female patients to be predisposed to TMJDs more than male patients.

In disagreement with (Lee *et al*., 2013) [28] reported in their study, the predominance of the male with TMJ disorders; another study (Modi *et al*., 2012) [34] concluded that no significant relationship between females and males regarding TMJ disorders.

In the researcher view the reason of higher prevalence of TMJDs among females than males because females more sensitive and perceive more stress than males as stress during pubertal development, family habits and the mores and values of the community.

Regarding to medical data; the results of the present study revealed that, about more than half of the study group have headache, sensitive teeth, periodontal disease and trouble sleeping. These results are in the same line with (Goncalves *et al*., 2011 & Graff-Radford& Abbott, 2016) [13, 19] who reported that, TMJDs involving muscle pain predisposes to migraines and chronic daily headaches and the more painful the TMJDs, the more likely it is to be associated with headache. According to (Smith *et al*., 2013) [42], some patients may have a history of headaches resistant to treatment; therefore, the TMJDs trigger should not be overlooked in such patients.

As regard factors associated with TMJDs; the following study revealed that psychological factors followed by parafunctional habits and occlusal factors are present the highest percent of risk factors causing TMJDs. Psychological stress can be considered an etiologic factor of temporomandibular joint disorders. In most cases the psychological factors are associated with physiological/functional factors, so it is important to identify the degree of involvement of each, which will enable optimal treatment scheme for the improvement and elimination of temporomandibular joint disorders debilitating symptoms.

The most prevalent occlusion factor in patients with TMJDs was the absence of teeth in agreement with (Costa *et al*., 2012) [7] who report that the loss of posterior teeth is associated with joint changes, particularly increasing the risk of cracking, and disc displacement.

Parafunctional or behavioral habits are a common cause of TMJ disorders. These include repetitive teeth clenching and/or grinding, also called bruxism, excessive gum chewing have been extensively studied as possible risk factors for TMJDs, Other parafunctional habits such as pen chewing, lip and cheek biting, jaw thrusting, nail biting and eating very hard foods are also suggested to contribute to the development of TMJDs. Such repetitive habits may be caused due to stress and other psychological factors, and may also disrupt other functions, such as sleep and/or mood. Also emotional stress can cause muscle hyperactivity, characterizing the so-called bruxism or clenching.

In the researcher view, more studies about etiological factors of TMJDs are needed as early and correct identification of the possible etiologic factors will enable the appropriate treatment plan application in order to reduce or eliminate TMJDs debilitating signs and symptoms.

As regard pain symptoms; the present study mentioned that, there are statistically significant differences for study group after implementation of the nursing management as regard pain symptoms about (pain in joint, pain in lower jaw, pain in forehead, pain in facial area, click sound in joint, ringing sound in ears, headache and fullness or pressure in ear) in agreement with (Alkhudhairy *et al*., 2018 & Kaushal *et al*., 2018) [1, 25]. Out of the symptoms present, in this study pain in joint followed with click sound in joint and headache were most common problems in disagreement with (Rani *et al*., 2017) [40] who stated that TMJ sound (clicking or crepitus) was the most common problem which was in accordance with the study done by (Gopal *et al*., 2014) [18].

Also the present study found that, there are statistically significant differences for the study group regarding normal daily activities cause pain symptoms. The pain may occur with yawning, chewing, swallowing, speaking, shouting, brushing, moving head and moving neck. Pain usually appears in the joint itself, in front of the ear, or it may move elsewhere on the face, scalp or jaw and lead to headaches, dizziness, and even symptoms of migraines.

Also the data reveals that, there are statistically significant differences for the study group regarding universal pain assessment tool. According to (Campos *et al*., 2008) [6] has reported significant associations between intra articular disorder stages and jaw pain. Conversely, according to (Palconet *et al*., 2012) [37] did not find an association between intra articular disorder stages and TMJ pain.

The present study showed statistically significant differences for the study group regarding characteristics of pain about kinds of pain (sharp, aching, deep and spreading), worsening of pain (morning and at meals), duration of pain (constant and lasts for a moment, hours or all day) and the pain start suddenly and stop gradually. According to (Pedroni *et al*., 2006) [38] stated that, the majority of the subjects described their pain as rhythmic, periodic or intermittent, suggesting the perception of intervals between painful events by the patients, a common characteristic of mechanical pain.

As regards dysfunction; the present study showed statistically significant difference for the study group about sound in joint (popping) and it is occurrence in agreement with (Mishra *et al*., 2015) [32] who stated that there was statistically significance difference regarding jaw sounds with regular follow up.

In some studies it has been stated that clicking sound from TMJ is the first and the foremost symptom of TMJDs (Khan, 2016) [26] as clicking sound during opening and closing of jaw is characteristic clinical sign of disc displacement with reduction. Disc displacement can be defined as abnormal position of articular disc against condyle and articular eminence of TMJ, these clicking sounds can be heard in those individuals who may or may not present with temporomandibular joint disorders (TMJDs).

While other studies (John & Robert *et al*., 2015) [23] suggested that, these joint sounds are harmless unless they are

accompanied by another sign or symptom. TMJ sound is an indication for mechanical interferences with joint. Methods and criteria for recording joint sounds differ in every study thus variable reports are possible reason for wide range of joint sounds (Fale *et al*., 2018) [12].

As regard miscellaneous and associated complaints and questions; the present study clarified that, there are statistically significant differences for the study group as regard tiredness of jaw muscles, jaw thrust habit or nervous twitch about the face, face swelling and production of more saliva or less saliva. In the researcher view the success of conservative management is often enough to control an uncomplicated TMJDs problem. Instruction in a self-care routine should include the following: rest of the masticatory system through voluntary reduction of mandibular function, habit awareness and modification, and a home physiotherapeutic program.

Also the study revealed statistically significant differences for the study group as regard blow on the jaw, excessively large bite, moving jaw forward or to the side, chewing hard food, clenching teeth, bruxism and chewing gum. These results are in agreement with (Fernandes *et al*., 2016 & Karibe *et al*., 2015) [13, 24] which showed that parafunctional habits were found to be strongly associated with painful TMJDs.

Also there are statistically significant differences for the study group as regard recent dental treatment in agreement with (Mitrirattanakul & Jariyasakulroj, 2018) [33] and in accordance with (Sahebi *et al*., 2010) [41] who stated that lengthy dental treatments can harm TMJ and masticatory muscles and wide opening of the mouth during such appointments can worsen the situation. Therefore, it is wise to break the appointment into shorter intervals and let the patients rest during treatment to close their mouth to prevent iatrogenic damage to TMJ. In researcher view it is considered an important point as many of patients in the study complained from TMJDs after dental treatment.

8. Conclusion

Conservative management including counseling, self-care, exercises, occlusal splint therapy, massage, manual therapy should be considered as the first choice treatment for TMJ disorders because of their low risk of side effects. The majority of TMJDs patients can be successfully treated by non-surgical therapies so a specialized nursing management was designed, implemented and evaluated. Study group showed improvement in TMJDs symptoms post implementation of the nursing management.

9. Recommendations

Based on the findings of the present study the following recommendations are suggested:

1. Awareness programs for patients who have TMJDs and require additional verbal and written information about improving TMJDs manifestations.
2. Pamphlets and simple illustration booklets should be available for patients to provide them with simple explanation about conservative management and safely living to maintain normal TMJ function.
3. Counseling included helping patients develop awareness and understand the cause and condition of the disorder and guiding the patients to avoid undesirable habits such as resting the chin on one hand, sleeping on one's stomach and excessive chewing habit.
4. The patients must understand the importance of following instructions to avoid further complications.
5. Tell the patients about the importance of regular follow-up at regular times.

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