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Influence of progress into the study of undergraduate dental program on prevalence of TMD and psychosomatic profile in Saudi dental school: RDC/TMD

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ABSTRACT

Objectives: To evaluate prevalence of Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) in King Abdulaziz University dental students and to study the relation between going further in studying dental program and TMD- psychological profile. **Methods:** Cross sectional study with randomly selected 64 female dental students (31 from 4th year and 33 from 6th year), was conducted in King Abdulaziz University- Faculty of Dentistry. The survey was done using (RDC/TMD) tool which consists of axis I (physical assessment, 84-item questionnaire and clinical examination for TMJ and muscles) and axis II (psychosocial and pain-related disability assessments depending on symptom checklist 90 (SCL-90). **Results:** Regarding distribution of axis I, it was found that 6.1-27.9-21.4% of the participants suffered from group I, II, III respectively. Regarding axis II, (25.8-27.2%) of 4th&6th year students respectively suffered from graded chronic pain (GCP) between (I:III) pain-related-disability grades. 48.1% of 4th year student in contrast to 87.7% of 6th year's showed higher depression scores with significant difference. **Conclusion:** RDC-TMD is a valuable tool for diagnosing TMD with different subgrouping. The distribution of RDC-TMD among dental students is (6.1-27.9-21.4%) in regards to (muscle disorder, disc displacements, other joint disorders) respectively. The psychological profile scores (depression and somatization) increase with going further into studying dental school program which denotes that older dental students suffer from more stress than young ones.

Kew words: RDC/TMD: depression, somatization, dental students, KSA students

Introduction

Temporomandibular disorders (TMD) are a heterogeneous set of pathologies affecting the temporomandibular joint (TMJ), the jaw muscles, or both (McNeill, 1997) . They are characterized by a typically described triad of clinical signs: muscle and/or TMJ pain; TMJ sounds; and restriction, deviation, or deflection of the mouth opening path (Laskin, 1969). TMD are considered to be the most frequent orofacial pain conditions of non-dental origin, but the frequent parallel presence of other symptoms, such as earache, headache, neuralgia, and tooth pain, which may be related to the TMD or be present as ancillary findings to be assessed in the differential diagnosis process, makes the assessment of TMD prevalence a complex issue (Leresche,1997).

Research Diagnostic Criteria for TMD (RDC/TMD) in 1992 was originally published (Dworkin and Leresche, 1992 and Steenks and Wijer, 2009). It provides criteria for a dual-axis diagnosis, i.e., the patient receives a physical diagnosis (axis I) along with a psychosocial assessment (axis II) which based on the biopsychoscocial model of pain that included dual axis and it is evidenced- base assessment protocol.(Dworkin and Leresche,1992). Data gathering with the use of RDC/TMD has been suggested to be a fundamental step to enable comparing findings from different studies for epidemiologic purposes and to obtain suggestions for the implementation of RDC/TMD usefulness in the clinical setting. (Steenks and Wijer, 2009).

The main features of the RDC/TMD that make them especially valuable in clinical research settings are: *(1)* a carefully documented and standardized set of specifications for conducting a systematic clinical examination for TMD; *(2)* operational definitions stated in unambiguous measurable terms for major clinical variables (eg, range of jaw motion, pain during muscle palpation, joint sounds); *(3)* demonstrated reliability for these operationally defined clinical measurement methods; and *(4)* use of a dual-axis system: Axis I to record clinical physical findings, and Axis II to record behavioral (eg, mandibular functional disability), psychologic (eg, depression, somatization), and psychosocial status (eg, chronic pam grade for assessing pain severity and life interference). In accordance with RDC/TMD version 1.0, (4) patients may receive >1 of the following group diagnoses: muscle disorders (group I); disc displacement (group II); and arthralgia, osteoarthritis, or osteoarthrosis (group III); The RDC/TMD axis I provides standardized criteria for TMD diagnosis which

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facilitate the achievement of a good intra- and inter-examiner reliability to non-expert examiners as well (Lausten *et al.,* 2004).

The Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) axis II for psychosocial assessment is considered the only existing tool that enables clinicians to evaluate the severity of chronic pain, originally developed by Von Korff *et al.,*(1990) and Von Korff *et al.,*(1992), and the levels of depression and somatization,(Dworkin and Leresche,1992) and its usefulness has been shown in the clinical setting.(Dworkin *et al.,* 2002) Nonetheless, few studies have been published on the prevalence of pain-related impairment, depression, and somatization levels, and little is known about the relationship between progression in studying dentistry in Saudi Arabia and those factors of depression and somatization.

The aims of this study was to evaluate the prevalence of Temporomandibular joint Disorders by Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) among KAU 4th and 6th year female dental students and to study the relation between going further into studying dentistry and TMD- psychosomatic profile.

Material and Methods

Study participants:

This cross sectional study was conducted in KAUFD following ethical approval that was granted by Ethical Committee at King Abdulaziz University, Faculty of Dentistry. The sample consisted of 64 female dental students (31 of the participants were 4th year students and 33 were 6th year students) who were selected randomly. Data of the present investigation were collected during the period September 2013 to June 2014, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia. All participants were informed about the study and gave their informed consent.

Criteria for exclusion from the study were the following (10): (a) age <18 years (because of the characteristics of the RDC/TMD, the reliability of which has been tested on adult populations); (b) presence of polyarthritis or other rheumatic diseases; (c) acute dental pain.

Data collection and RDC/TMD measurement:

At the beginning, all participants who reported or presented with at least two of the cardinal signs or symptoms of TMD: Jaw pain, limited mouth opening, muscle pain or TMJ noise were diagnosed as non-RDC/TMD patient.

For RDC/TMD measurements, the data collection was done as following; two investigators were calibrated by an experienced Professor until their reliability to assess TMD signs and symptoms as suggested by the literature was achieved. Distribution of the Arabic version of (RDC/TMD) questionnaire (87 items) on study participants was done including the dual axis system. Then, a clinical examination of TMJ and the surrounding muscles was done according to the standardized published specifications.

A. Scoring of the findings for subsequent grouping according to Axis I criteria (4) :
   TMD are classified into 3 categories (10) as shown in Table 1.
B. Asses the level of the psychosomatic status of students and the TMD related psychological disability according to Axis II criteria:

Subjects completed the RDC/TMD Axis II self-report measures, which include the Graded Chronic Pain Scale (GCPS) which depends on the Characteristic Pain Intensity (CPI) and Jaw Disability Checklist, and the Revised Symptom Checklist (SCL-90-R) (Derogatis, 1983)

First, GCPS domain is composed of six items assessed(Q7:9 and 11:13) on a 10-point scale, and one item on the number of disability days (Q10) due to facial pain and scoring criteria are simple to use. It assesses pain intensity, interferences with usual activities, family and leisure activities, work-related activities. Then**,** assessment of the psychological status using mean depression and somatization scores from subscales of the Symptom Checklist-90 (SCL-90) an instrument originally developed by Derogatis (Derogatis, 1983)

Second, the psychological status was assessed through depression (DEP) and non-specific physical symptom (somatization SOM) scores measured with subscales of SCL-90-R. The questionnaire included 32 questions with 5-point Likert response scale (ranged from 0 to 4), 12 items of somatization subscale and 20 items of depression subscale with total of 32 items. The domain was derived from items 20 (a,c,d,j,o,p,r,s,t,u,w and x) when pain items were excluded, the remaining domain consisted of items 20(c,r,s,t,u,w,and x) finally the domain for depression was derived from items 20 (b,e,f,g,h,I,k,l,m,n,q,v,y,z,aa,bb,cc,dd,ee,and ff. ref 19 The five nonspecific pain conditions examined were headaches, heart/chest pain, lower back pain, nausea/abdominal pain (upset stomach), and muscle pain. These items were incorporated into the SCL-90, and patients were considered to have a pain item if they responded “moderately” to “extremely” when asked how much the pain item distressed them in the last month. (Manfredini *et al.,* 2010; Yap *et al.,* 2002 and Dworkin and Leresche, 1992)

Table I. RDC/TMD criteria for axis I diagnoses

***Group I: muscle disorders*(MD)**
Ia. Myofascial pain: ● Report of pain or ache in the jaw, temples, face, preauricular area, or inside the ear at rest or during function; ● Pain reported by the subject in response to palpation of _3 of the following muscle sites: posterior temporalis, middle temporalis, anterior temporalis, origin of masseter, insertion of masseter, posterior mandibular region, submandibular region, lateral pterygoid area, and tendon of the temporalis; ● At least one of the painful sites must be on the same side as the complaint of pain.
Ib. Myofascial pain with limited opening: ● Myofascial pain as defined in Ia; ● Pain-free unassisted mandibular opening _40 mm; ● Maximum assisted opening (passive stretch) _5 mm greater than pain-free unassisted opening.
***Group II: disc displacements*(DD)**
IIa. Disc displacement with reduction: Reciprocal clicking in TMJ, reproducible on 2 out of 3 consecutive trials; or ● Clicking in TMJ on both vertical range of motion (either opening or closing), reproducible on 2 out of 3 consecutive trials, and click during lateral excursion or protrusion, reproducible on 2 out of 3 consecutive trials.
IIb. Disc displacement without reduction with limited opening: ● History of significant limitation in opening; Passive stretch increases opening by _4 mm over maximum unassisted opening; ● Contralateral excursion _ ● Absence of joint sound or presence of joint sounds not meeting criteria for disc displacement with reduction.
IIc. Disc displacement without reduction, without limited opening: ● History of significant limitation of mandibular opening; ● Maximum unassisted opening _35 mm; ● Passive stretch increases opening by _5 mm over maximum unassisted opening; ● Contralateral excursion _7 mm; ● Presence of joint sounds not meeting criteria for disc displacement with reduction; ● In those studies allowing images, imaging conducted by either
Group III: arthralgia, osteoarthritis, osteoarthrosis(AAA)
IIIa. Arthralgia: ● Pain in one or both joint sites (lateral pole and/or posterior attachment) during palpation; ● One or more of the following self-reports of pain: pain in the region of the joint, pain in the joint during maximum unassisted opening, pain in the joint during assisted opening, and pain in the joint during lateral excursion;
IIIb. Osteoarthritis of the TMJ: ● Arthralgia as defined in IIIa; ● Either coarse crepitus in the joint or radiologic signs of arthrosis.
IIIc. Osteoarthrosis of the TMJ: ● Absence of all signs of arthralgia; ● Either coarse crepitus in the joint or radiologic signs of arthrosis.

Scoring protocol for axis II:

Graded chronic pain classification

Characteristic Pain Intensity (CPI) was evaluated through scoring items in the questionnaire about pain history. The patient's score ranged from 0 to 100, with 100 being the most intense pain. Disability Points was calculated as the sum of points for disability days and points of disability score.

The GCPS was used to classify individuals according to Characteristic Pain Intensity and Disability Points on grades (I to IV). The detailed description of each grade is shown in table (2)

DEP and SOM scoring

The mean scale score is calculated by summing up the score of the single items. This makes possible to rate patients as having normal, moderate or severe levels of impairment in the depression and non-specific physical symptoms scales. The limit of each is shown in table (2), (Manfredini *et al.,* 2010).

Table 2: Grading scores of Axis II

Graded Chronic Pain Scale GCPS	**Description**
grade 0	no TMD pain in the previous 6 months
Low Disability **grade I**	Low Intensity Characteristic Pain Intensity < 50, and less than 3 Disability Points
grade II	High Intensity Characteristic Pain Intensity > 50, and less than 3 Disability Points
High Disability **grade III**	Moderately Limiting 3 to 4 Disability Points, regardless of Characteristic Pain Intensity
grade IV	Severely Limiting 5 to 6 Disability Points regardless of Characteristic Pain Intensity
DEP	
	no (≤ 0.535)
	moderate(0.535-1.105)
	severe(≥1.105)
SOM(with pain items included)	
	no (≤ 0.500)
	moderate(0.500-1.00)
	severe(≥1.00)
SOM(with pain items included)	
	no (≤ 0.428)
	moderate(0.428-0.857)
	severe(≥0.857)

Statistical analysis

All the data were tabulated and statistically analyzed. Calculation of mean and standard deviation and comparison through Chi-squared test at the 5% level of confidence were performed using SPSS foundation for statistical computing, Vienna, Austria. ISBN 3-900051-07-0).

Results:

-Demographical data:

The mean of the age among 4th y students was (21.9) with average 16.6 years of education while it was (23.3) and 17.87 years respectively among 6th y students. Regarding ethnicity nearly half of them were Saudi in their origin in both groups and the others have Asian or Indian or Yemen background.

-Prevalence of TMD among dental students:

The percent of the total number of students who diagnosed with TMD using the RDC-TMD was (21.8 %) and it is less than the percent of the same students when compared to non-RDC-TMD diagnostic classification (54.7%). There is statistical significant difference with P-value of (0.001) between both diagnostic classifications. Figure (1)

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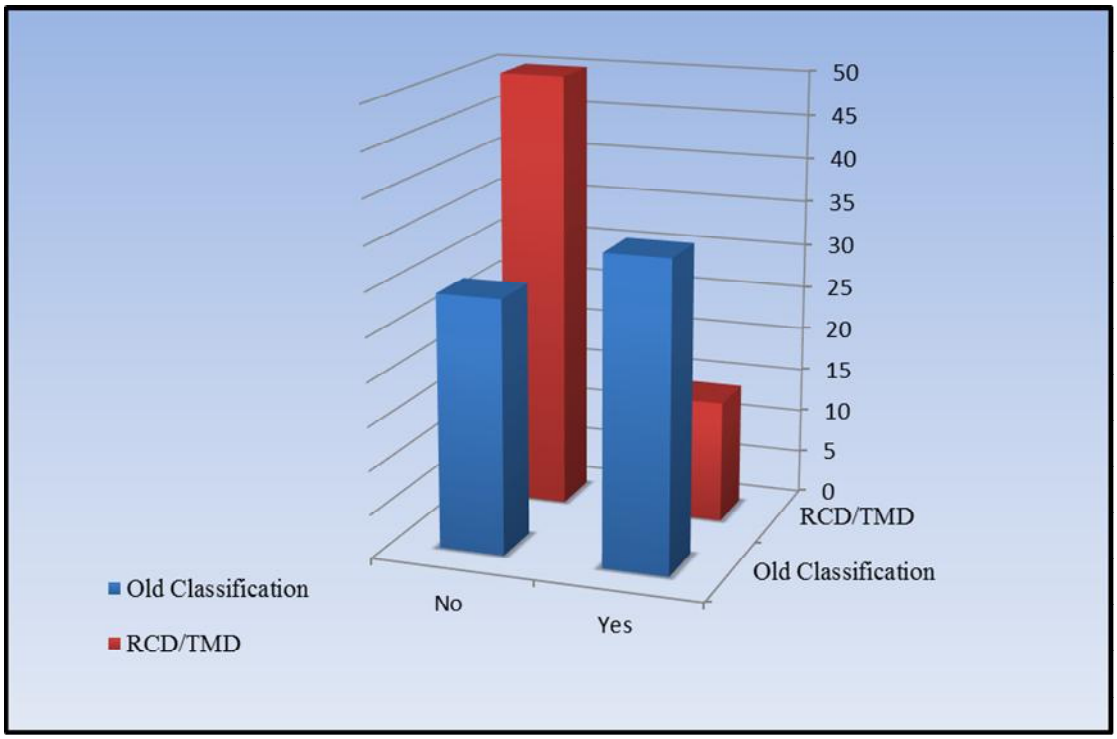

Figure 1: Comparison between the prevalence percentage of TMD using RDC-TMD and non- RDC-TMD classifications.

-Comparison of Axis I diagnosis among 4th &6th years dental students:

In Axis I diagnosis, (87.1%) of 4th year and (69.7%) of 6th year samples had no Axis I group. Group I was found only in (6.1%) of 6th year. Group II was found in (18.2%) of 6th year and (12.7%) of 4th year with total percent of (15.6%) of the whole sample. Group III was found in (24.2%) of 6th year students and (3.2%) of 4th year students with total percent of (14.0%) of the whole sample. The distribution of all groups among both years is shown in table (3) & fig (2).

Table 3: The distribution of all groups among 4th and 6th year students.

TMD	Sub-groups	4th year	6th year
gr1	no	31	31
	mf Ia	0	0
	mf Ib	0	2
grII rt	no	28	30
	II a	2	3
	II b	1	0
	II c	0	0
grII lt	no	30	30
	II a	0	3
	II b	1	0
	II c	0	0
grIII rt	no	30	27
	III a	1	6
	III b	0	0
	III c	0	0
grIII lt	no	31	31
	III a	0	2
	III b	0	0
	III c	0	0

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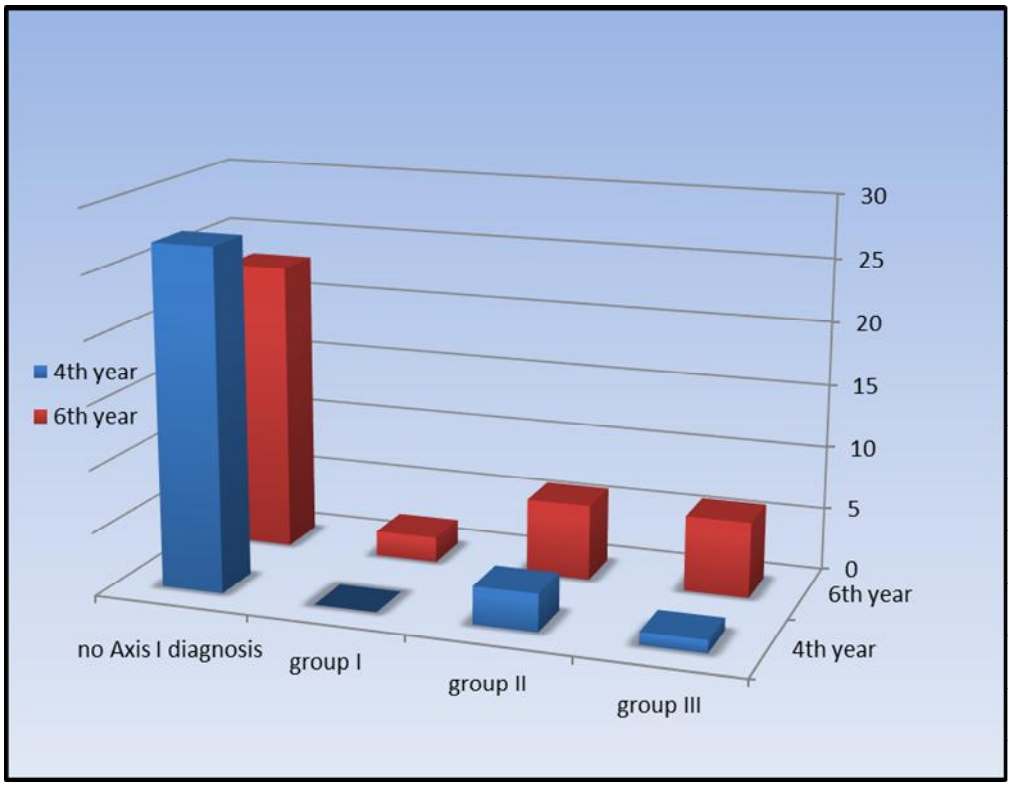


Fig. 2: Distribution of Axis I diagnosis among 4th and 6th year students

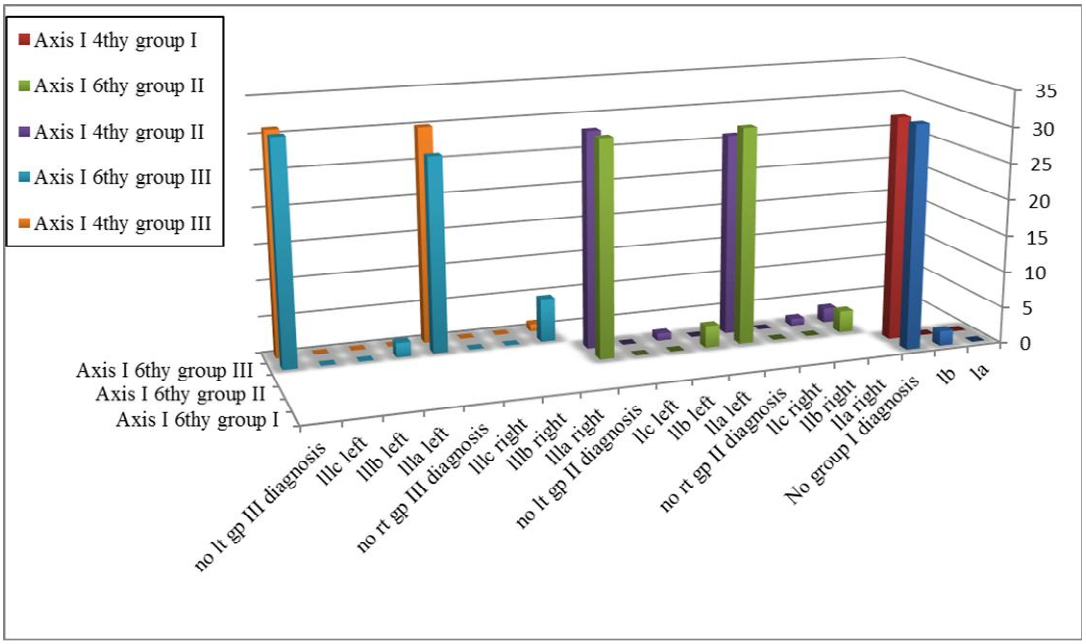
-Single and multiple diagnosis among 4th &6th years dental students:

The participants who meet single diagnostic criteria for any of RDC-TMD groups were 21 students (16 from 6th year and 5 from 4th y) that equal to 32.8% in contrast to 7 students (all from 6th year) that represents 10.9%. Details of sub-grouping are shown in table (4) and fig (3).The participants complaining from single diagnosis were three times those with multiple diagnoses (21:7).

Table 4: Details of single and multiple diagnoses among both years.

Axis I subgroups	4th year students	6th year students	Total
MD	0	2	2
DD	4	6	10
AAA	1	8	9
MD+DD	0	1	7
MD+AAA	0	2	
DD+AAA	0	3	
MD+DD+AAA	0	1	

MD: muscle disorder DD: disc displacement AAA: arthralgia, osteoarthritis, osteoarthrosis



(-Ia .Myofacial pain - Ib.Myofacial pain with limited opening) (-IIa.DD with reduction -IIb.DD without reduction with limited opening -IIc. DD without reduction without limited opening) (-IIIa.Arthralgia -IIIb.Osteoarthritis -III.Osteoarthrosis)

Figure 3: Detailed distribution of Axis I diagnosis among 4th and 6th year students

-Chronic pain grade classification (GCP):

According to Axis II diagnosis, GCP grade I was found in 6 students that denotes (19.35%) of 4th year and 9 students that denotes (27.3.3%) of 6th year. One student of each year grouping was suffering from grade II that equals nearly to (3%) of both student groups .Only (3.22%) of 4th year group was found to have grade III of GCP table (5) & fig (4). Distribution details of pain items and types among the groups are reported in table (6). 85.9% of the participants were distressed by headache followed by 76.5% complaining of lower back and muscle pain. The least percent 43.7% was reported with chest pain. Our results denoted that high percent of these students (20.3% of 4th y-28.1 of the 6th y) had ≥3 pain items.

Table 5: Chronic pain grade classification (GCP): among both years.

GCP	4th y students	6th y students
0	23	23
I	6	9
II	1	1
III	1	0
IV	0	0

Table 6: Distribution details of pain items and types among the groups

Number of pain items	4th y students	6th y students	Total (n)	Total percent (%)
0	3	0	3	4.6
1	3	3	6	9.3
2	4	3	7	10.9
3	5	8	13	20.3
4	6	12	18	28.1
5	10	7	17	26.5
Types of pain				
Headache	26	29	55	85.9
Chest pain	15	13	28	43.7
Lower back pain	21	28	49	76.5
Nausea	18	16	34	53.1
Muscle pain	20	29	49	76.5

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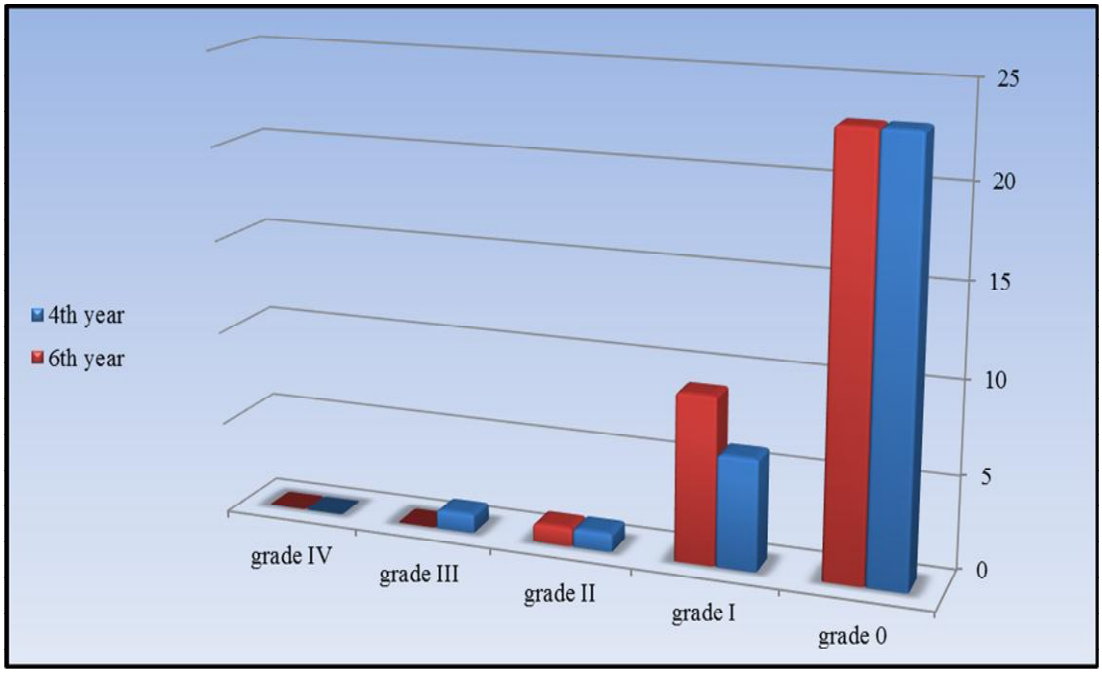

Fig. 4: Distribution of GCP grades among 4th and 6th year students

Pschycosomatic scores:

Axis II diagnosis, revealed that the 6th year group had mean scores which indicate severe depression with mean value of (1.6) and nonspecific physical symptoms (somatization) with pain items included mean equals (1.2) and with pain items excluded (0.9) .In contrast, the 4th year group had scores that indicate severe depression mean value of (1.2) but moderate nonspecific physical symptoms (somatization) with pain items included mean equals (0.9) and with pain items excluded (0.6). There is statistical significant difference with P-value of (0.04) between both groups regarding depression while no statistical significant difference between both groups in regards to somatization both profile scores. Details of different scores of psychosomatic items are presented in table (7) and fig (5).

Table 7: The distribution of pschycosomatic profile among 4th and 6th year students.

Pschycosomatic profile		**4th y students**	**6th y students**	**Total (n)**	**Total percent (%)**
Depression(DEP)	no	5	4	9	14
	moderate	13	4	17	26.3
	severe	13	25	38	59.3
	M±SD	1.168±0.7	1.586±0.6		
Somatization(SOM-with pain)	no	8	5	13	20.3
	moderate	10	12	22	34.3
	severe	13	16	29	45.3
	M±SD	0.885±0.6	1.210±0.6		
Somatization(SOM-without pain)	no	14	7	21	32.8
	moderate	9	12	21	32.8
	severe	8	14	22	34.3
	M±SD	0.644±0.5	0.937±0.6		

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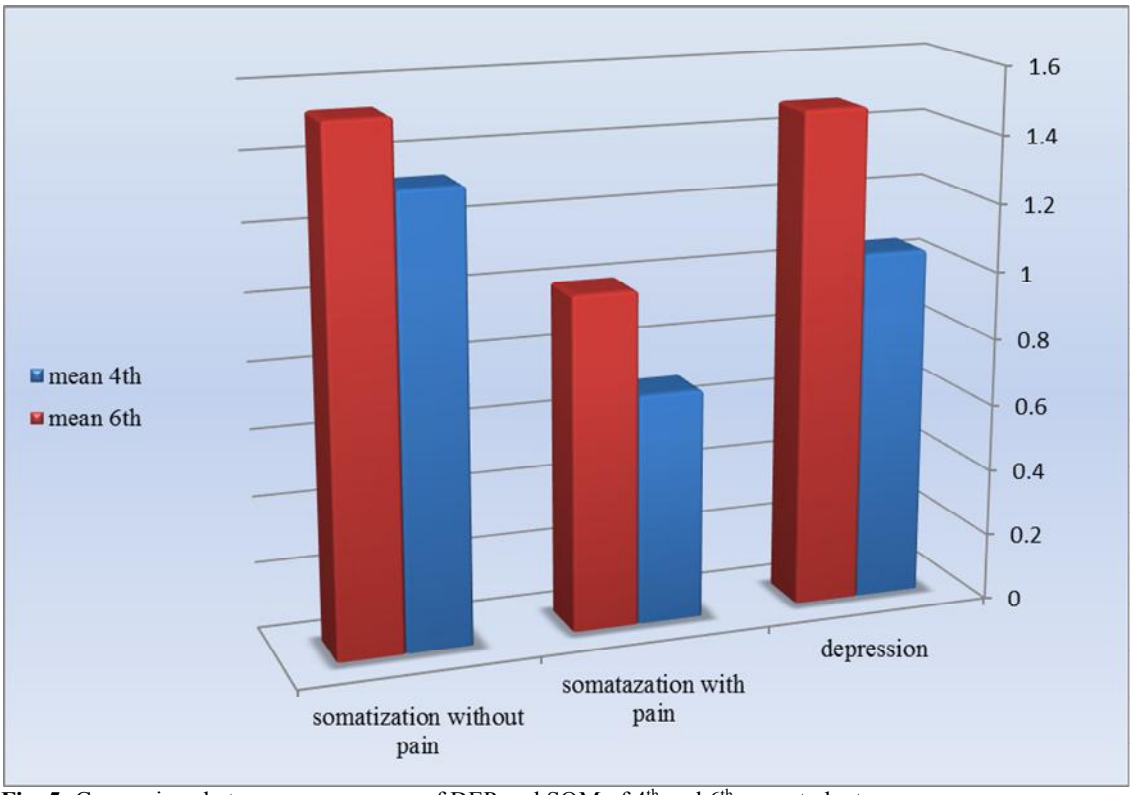

Fig. 5: Comparison between mean scores of DEP and SOM of 4th and 6th year students.

Discussion

Since the time that, the RDC/TMD have been used to categorize TMD patients according to their physical diagnosis (axis I) and pain-related disability and psychologic status (axis II),(Dworkin and Leresche,1992) it offers clinicians with a standardized system that can be used for examining, diagnosing, and classifying the most common subtypes of TMD. One of the primary aims of this classification system was to facilitate cross-population comparison between different investigations to increase knowledge on TMD epidemiology and to circumvent confusion generated by the use of multiple terms to indicate the same disorders.(The International RDC/TMD Consortium (International RCD/TMD,2010)

The reviewed literature suggested that treatment seeking populations of TMD patients are mostly composed of women. Such an observation is in line with the gender distribution of other painful musculoskeletal disorders showing a female predominance. (Celić *et al.,* 2011 and Janal *et al.,* 2008) For that reason our participants of female gender were chosen. To our knowledge, this is the first study to examine the relationship between RDC/TMD axis I and axis II findings in Female dental students and to study the relation between going further into studying dentistry and TMD- psychosomatic profile.

The results of this study demonstrated that the percentage of the total number of students who diagnosed with TMD using the RDC-TMD was less (21.8%) than the percent of the same students (54.7) when compared to non-RDC-TMD diagnostic classification and there is statistical significant difference. These results are in concurrence with previous findings done by non-RDC diagnostic measures as shown in table (8) with prevalence ranged between (14.1-75%). Early investigations suggested that 1%-75% of general population subjects showed at least 1 objective TMD sign, and that could be considered as broad prevalence range deprived researchers from scientific comparisons.5,6 (Manfredini *et al.,* 2011). Also our results are quite similar to that done by Al-Harthy *et al.* (2010) who found the prevalence of TMD is 18% using RDC diagnostic measure.

The minor difference between the present results and that of Al-Harthy et al. (2010) may be related to the participant's gender-related choice in our study in contrast to mixed gender choice in their study. In addition, TMD symptoms have always been considered to have a prevalence peak between 20 and 40years of age and that was our mean age (22.6) (Manfredini *et al.,* 2011).

The previous discussion denotes better standardized capability and reliability of RDC tool in comparing TMDs groups as appraised in many studies ((Manfredini *et al.,* 2011 Meltem et al., 2013; Ohrbach *et al.,*2008 and Steenks and Wijer,2009)

Table 8: Prevalence (%) of prevalence of TMD in different epidemiological studies on children and adolescents.

Study	TMD %
Nourallah 1995	30
Abdel-Hakim 1996	32
Al Amoudi *et al* 1998	16.5
Farsi N. 1999	14.1
Farsi N. 2003	31.1
Feteih 2005	34
Nassif 2003	75
Al-Harthy 2010	18

An unspecific group II disorders diagnosis was assigned to 15.6% of patients, the large majority of which received a diagnosis of disc displacement with reduction. This high frequency agrees with other studies done by John 2007 and Reissmann 2007 (Manfredini *et al.,* 2011).The next most frequent TMD subdiagnosis was the inflammatory-degenerative disorders (group III) and it was diagnosed in about 14.0%, with arthralgia being the most frequent diagnosis in this subgroup. Up to our knowledge, only 2 studies reported the prevalence of each subgroup diagnosis, thus limiting the possibility to discuss the findings in the general population in depth and they aren't in Arabian countries (Manfredini *et al.,* 2011).

The number of papers adopting the RDC/ TMD to describe the prevalence of the different TMD related diagnoses was surprisingly low and Second, The scarcity of epidemiological studies of adults who suffer from orofacial pain and TMD in Saudi Arabia add to the difficulty ref (Manfredini *et al.,* 2011) Third, group II and III diagnoses were reported either in terms of the percentage of patients who received the diagnosis, or in terms of the side of the joint(s) affected by the disorder. Such a different approach prevented performing proper analysis (Manfredini *et al.,* 2011)

In all studies, the most frequent group II diagnosis was disc displacement with reduction, with a prevalence ranging from 15% to 39%, while disc displacement without reduction with/without limited opening had a low frequency (0–5%). Disc displacement with reduction was also the most common group II diagnosis in non-patient populations (15.8%), as reported in a Finnish study conducted among multiprofessional media personnel (Alamoudi *et al.,* 1998). The observation that disc displacement is common among non-patients has been suggested by many authors (Kurkcu,2005); such findings, along with the well-described high variability of disc position in asymptomatic subjects as well (Anderson *et al.,* 2010), lend support to the hypothesis that disc displacement ca Kurkcu n sometimes be considered a non-pathologic or, at least, a non-treatment- requiring condition. The prevalence of arthritis and arthrosis was higher than that in other studies. This may be attributed to the fact that many forms of articular remodeling are clinically silent and can be diagnosed only by means of radiological examinations,ref16 Although both student groups were similar with subgrouping (I&11) of TMD , they were distinct with regard to group III which is hard to be explained.75% of TMD students had only one TMD diagnosis (MD or DD or AAA), 25% of patients had multiple diagnoses (MD+DD, MD+AAA, DD+AAA, MD+DD+AAA) according to the RDC/TMD protocol. (Celić *et al.,* 2011). The presence of percentage of participants who had more than one RDC/ TMD diagnosis, confirming observations about the complexity of clinical symptomatology in TMD patients (Dworkin and Leresche, 1992; Von Korff *et al.,* 1992 and Kurkcu, 2005). Findings of the present investigation can only be compared with two studies collected in Italian poupulation. Our results are not similar to their results. Data about the relative frequency of single and multiple diagnosis are mostly important in terms of their prognosis but, unfortunately, little attention has been given to such issues so far. The prevalence of multiple diagnoses was suggesting that a combination of muscular and articular disorders may be present in clinical reality which is worthy to be further investigated (Manfredini *et al.,* 2006).

Our findings agree with other studies (Al-Harthy *et al.,* 2010; Yap *et al.,* 2002 and Abduljabbar *et al.,* 1996) that found the most common chronic pain is headache. Headache is frequently found in women (47%) and nearly twice as often as in men (25%). Zulqarnain et al. in 1998 reported frequent headache more than twice weekly in 31.4% of female university student population in Saudi Arabia (34). 67.5% of the students were distressed by lower back and muscle pain items. Nearly 75% experienced three or more pain items (Table 6). It is proved that, the presence of multiple pain symptoms was associated with elevated levels of depression/somatization. The hypothesis linking multiple pains to the somatic expression of psychiatric and psychosocial disturbance, as proposed by Dworkin et al. (2002) was supported by our results. Multiple pains might be the somatic expression of depression in some TMD patients and support the hypothesis that increased

physical symptoms are a modal response to psychologic distress that may occur in depressive, anxiety, or adjustment disorders (Yap *et al.,* 2002).

GCP grades for participants were mainly found to be grade I, followed by grade II. These grades found in Saudi Arabian females were not aligned with GCP grades found for females in other studies (Celić et al., 2011; Kurkcu, 2005 and Van Selms *et al.,* 2008). In these studies, grades III and IV were also found. The GCP includes number of days kept from usual activities (work, school, and house) due to orofacial pain, and the grades thus depend on these activities (Al-Harthy *et al.,* 2010). So, difference in findings between studies might be related to the nature of our dental students who has to be committed regarding attendance required for completing their courses.

In our findings only 1.5% were moderately phycosocially disabled group III. The majority of students (71.8%) were psychosocially functional without any disability and only 26.5% of patients were found to be mildly psychosocially dysfunctional (grade I& II on chronic pain scale). None of the participants suffered severely limiting disability from TMD. The percentage of dysfunctional patients was much lower than that observed for Swedish and US TMD patients (13% to 20%).(Yap *et al.,* 2002 and Reiter *et al.,* 2006). Also, noticeable difference was found when our results were compared to those of the Asian group of patients as only 4.2% of the Asian patients received a chronic pain grade of III, while there is a similar matching results regarding absence of those having grade IV. (Meltem *et al.,* 2013; Manfredini *et al.,* 2006 and Reiter *et al.,* 2006).Relation between TMD and depression is appraised in many studies ref 60+20. Mental distress (often called 'stress') has been reported in the literature to be a risk factor or initiating factor for TMD (Nassif *et al*.,2003).For depression and somatisation, the mean values for depression and somatisation in the whole groups were 1.37 and 0.91 respectively. Percentages of SCL-90-R scores of moderate-to-severe psychosomatic profile were higher (DEP 59.3% & SOM 40%) than scores reported in studies of non-Arabian populations (DEP 20% & SOM 25%) (Celić *et al.,* 2011). In multicenter study done in Italy Israel Finland and Netherlands the percent reaches up to an average of (DEP 45.6% & SOM 56.4%) (12).In Chinese population it reaches (DEP 42.5% & SOM 59.7%) (Lee *et al.,* 2008). The cause of difference might be attributed to variation in ethnic backgrounds. Ethnicity not only includes race, but also refers to characteristics that are of a social, psychological, cultural, and political nature (Reiter *et al.,* 2006). Ethnicity has been suggested to influence health beliefs meaning of symptoms and illness behavior including the way of perceiving and responding. (Suvinen and Reade, 1995). Depression scores was similar to that reported for Arabian females in the Reiter et al study (DEP 60%) and higher than that of Al-Harthy *et al.* (2010) (DEP 38%) for adult Saudi Arabians. The difference might be explained on the basis of westernized culture society of dental students or to the gender related reasons. 18 reported that less traditional people (i.e., more westernized) had a significant increased rate of psychiatric disorders and higher scores on psychopathology measures, especially among females. Chuang found that female dental students when answering a questionnaire related to TMD usually centered on psychological factors (Chuang, 2002). Nassif *et al.*(2003) documented these findings in their study on elite group with high physical stress and mental distress associated with elevated levels of TMD in a 4 year cadet military training program Nassif *et al.*(2003) .

In the present study statistical analysis showed significant differences in mean depression and non-specific physical symptoms scores between 4th and 6th year students. We found that the 6th year students had the higher rates of depression and somatization suggesting that the progression further into studying dentistry in undergraduate level could possibly exacerbate the condition. This is in accordance with findings from a previous study done by Waghachavare *et al.* (2013).They concerned with association between stress and the field of education. Their results showed significant association and the highest scores of stress were presented in dental students followed by medical and engineering students. Various studies around the globe have emphasized that students studying in dental courses experience higher stress. (Leresche, 1997; Dworkin and Leresche, 1992; Steenks and Wijer, 2009 and Lausten *et al.,* 2004; Zulqarnain *et al.,* 1988; Chuang, 2002; Sugiura *et al.,* Gorter *et al.,* 2008 and Alzahem *et al.,* 2011) Dental students showed a negative development through the years from first to fifth year with regard to psychological distress. These students experienced an extensive period of training (Gorter *et al.,* 2008).The major sources of reported stress were related to examinations, clinical requirements and dental supervisors. Studies suggest using signs and symptoms for early detection of stress and proper intervention (Alzahem *et al.,* 2011). Professional students suffer from frustration and depression from symptoms, arthritis and stomach disorders than non professional students. The variations in the academic depth of courses of study and different study hours needed.

Conclusion

In conclusion, findings of this study showed a high frequency of TMD pain in these Saudi Arabian undergraduate dental students. Participants had multiple pain items ≥3 items. All of TMD patients met the criteria for subdiagnoses of TMD. High frequency of headache was reported. These results support the usefulness of RDC/TMD when comparing data from various international TMD studies. To the author's knowledge, this is the second study that uses the RDC/TMD in Saudi Arabia and/ or Arabian countries, and this makes it now possible to compare TMD prevalence with other studies. 6th year students presented high scores of

depression and somatisation but low disability grades concerning GCP. The psychological profile scores (depression and somatization) increase with going further into studying dental school program which denotes that older dental students suffer from more stress than young ones.

Our findings call attention to the need for further clinical research with RDC in Saudi Arabia and the importance of prevention and intervention of stress amongst undergraduates. It is recommended that the dental school has to distinguish faculty or program related causes that led to stressing their students and introduce of stress reduction programs.

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