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Age-related differences in diagnostic categories, psychological states and oral health–related quality of life of adult temporomandibular disorder patients

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Abstract

Objectives: The peak prevalence of temporomandibular disorders (TMDs) may occur in middle age. This study determined the proportion of matured adults seeking TMD treatment and compared their diagnostic, psychological and oral health–related quality-of-life (OHRQoL) profiles to younger patients.

Methods: Adult subjects were recruited from a tertiary TMD centre and assigned to three age groups, namely 18-44 years (young adults [YA]), 45-64 (middle-aged adults [MA]) and ≥65 (old adults [OA]). TMD diagnoses were established with the Diagnostic Criteria for TMDs and categorised as pain-related (PT), intra-articular (IT) and combined (CT) TMDs. Psychological states and OHRQoL were assessed with the Depression, Anxiety, and Stress Scale-21 (DASS-21) and Oral Health Impact Profile-TMDs (OHIP-TMDs). Demographic, DASS-21, and OHIP-TMDs data were analysed using chi-square test, one-way ANOVA and Pearson's correlation ($P < .05$).

Results: Middle-aged (19.7%; 136/692) and old (4.0%; 28/692) adults comprised about a quarter of the TMD patients. Although gender distribution was comparable, significant differences in TMD categories were observed ($P < .001$). Pain-related TMDs were more prevalent in the MA/OA groups while intra-articular TMDs were more frequent in the YA group. No significant difference in DASS-21 and total OHIP scores was noted among three groups. However, the MA and OA groups had significantly lower OHRQoL in the physical pain domain. Correlations between DASS-21 and OHIP-TMDs scores varied with age and ranged from $r_s = 0.47$-0.92.

Conclusions: Matured patients constituted a quarter of TMD cohort and presented higher frequencies of painful TMDs. They have similar psychological profiles to younger patients but experienced lower OHRQoL in physical pain domain.

KEYWORDS

age, gender, oral health-related quality of life, psychological states, temporomandibular disorders

1 | BACKGROUND

Temporomandibular disorders (TMDs) belong to a group of illness collectively known as 'chronic overlapping pain conditions (COPCs)' that include fibromyalgia, irritable bowel and chronic fatigue syndromes.[1] TMDs are characterised by oro-facial pain and dysfunction of the masticatory muscles, temporomandibular joints (TMJs) and contiguous structures.[2] The prevalence of TMDs in children and adults vary between 7% and 30%, while their incidence is about 4% per annum.[3-5] TMD patients are typically 'women of child-bearing age' (aged 20 to 40 years).[2,6] However, Janal et al in their examination-based study reported TMD prevalence to be the highest among 50- to 59-year-olds.[7] Moreover, several more recent studies had also suggested that the peak prevalence of TMDs happens in middle age (45 to 64 years old).[1,8] Their occurrence in the elderly (aged ≥ 65 years) was also relatively high at about 3 to 5%.[9,10] Sampaio et al investigated the presence of TMDs in an elderly population and found that approximately 50% of non-institutionalised and 53% of institutionalised older adults had some TMD symptoms.[11] The symptoms are usually mild, self-limiting, and can often be managed with self-care.[12]

The Research Diagnostic Criteria for TMDs (RDC/TMD) was introduced in 1992 and was the benchmark for TMD diagnosis for more than two decades.[13] It was developed on the principles of a 'dual-axis' biopsychosocial model, 'protocolized' history taking/examination, and an 'operationalized' diagnostic scheme that allows for multiple TMD diagnoses.[14] The RDC/TMD has been succeeded by the Diagnostic Criteria for TMDs (DC/TMD) that has better validity and is applicable in both research and clinical settings.[15] Based on the DC/TMD, common TMDs can be classified into pain-related and intra-articular joint disorders. While pain-related TMDs include myalgia, myofascial pain, arthralgia, and headache attributed to TMDs, intra-articular TMDs encompass TMJ subluxation, disc displacements, and degenerative joint disease (DJD). TMJ DJD, which comprises osteoarthrosis and osteoarthritis, has been shown to increase with advancing age and maybe the predominant TMD subtype in middle-aged and old adults.[16,17] It was further posited that TMD patient populations are made up of two diagnostic subgroups in relation to age with TMJ DJD as the central differentiating factor.[17]

The multifactorial aetiology of TMDs and its consistency with the 'biopsychosocial model of illness' had been established through a large prospective cohort study.[18] Psychosocial risk factors for TMDs include heightened levels of pain catastrophising, somatic awareness, depression, anxiety, and stress.[19-21] Moreover, moderate-to-severe levels of depression were detected in 21 to 60% of TMD patients.[22] Due to multiple comorbid health conditions and their related physical and psychosocial disabilities, matured adults may be at higher risk of psychological distress than younger ones.[23,24] The functional, physical, and psychosocial impairments associated with TMDs were found to negatively impact oral health–related quality of life (OHRQoL).[25,26] Furthermore, the negative impact seemed to increase with age in TMD patients.[26] OHRQoL is a multidimensional construct that embraces the subjective evaluation of a person's 'oral health, functional well-being, emotional well-being, expectations and satisfaction with care, and sense of self'.[27] Patient-centred OHRQoL outcome measures can be generic or condition-specific. Condition-specific measures are designed to draw on the symptoms/impacts accompanying specific ailments and thus have better sensitivity, specificity, and responsiveness compared to generic ones. Additionally, they minimise 'floor effects' (ie no impact) as the items surveyed are anticipated to be more relevant and/or prevalent.[27,28] A TMD-specific OHRQoL measure known as the Oral Health Impact Profile-TMDs (OHIP-TMDs) was introduced by Durham et al in 2011.[29] It involves 22 items of which twenty were from the original OHIP and two from qualitative enquiry on TMD patients. Both the original English and translated Chinese versions of the OHIP-TMDs have demonstrated good reliability and validity for evaluating OHRQoL in TMD patients.[30,31] Lately, the discriminative ability of the OHIP-TMDs was appraised and it was able to distinguish between community subjects with and without TMDs alluding to its possible use as a TMD-specific OHRQoL tool in epidemiological studies.[25]

Given the dearth of information on age-related differences in TMD patients, the objectives of this study were to determine the proportion of middle-aged and older adults seeking TMD treatment and to compare their diagnostic, psychological, and OHRQoL profiles with that of young adult patients. The correlations between psychological symptoms and OHRQOL for the various age groups were also examined. The null hypotheses were as follows: (a) the proportion of matured adults seeking TMD management is comparable to that of young adults, (b) there is no difference in psychological distress and OHRQoL between young, middle-aged, and old adult TMD patients, and (c) there is no correlation between depression, anxiety, stress, and OHRQoL for the three age groups.

2 | METHODS

2.1 | Study design and TMD diagnoses

This cross-sectional study was authorised by the Biomedical Institution Review Committee of Peking University School of Stomatology (protocol number: PKUSSIRB-201732009). A total of 769 consecutive adult patients (≥18 years) attending a tertiary TMDs and oro-facial pain centre from May 2018 to December 2019 were invited to contribute to the study. Study participation was voluntary and written informed consent was attained from all participants. The subject exclusion criteria were as follows: (a) presence of major trauma and/or operations; (b) presence of drug abuse and/or major psychiatric disorders; (c) presence of major autoimmune and/or metabolic diseases (eg multiple sclerosis), (d) presence of non-TMD joint and/or muscle diseases (eg septic TMJ arthritis and myositis ossificans); (e) current consumption of central nervous system agents; (f) cognitive impairment and/or illiteracy. The TMD patients were assigned to three age groups, namely 18-44 years (young adults [YA]), 45-64 (middle-aged adults [MA]) and ≥ 65 (old adults [OA]). Demographic information, medical, and dental histories

were gathered, and TMD examination was carried out by a trained TMD specialist based on the DC/TMD protocol. TMD diagnoses were established with the DC/TMD 'diagnostic tree' and associated algorithms[15] and categorised into pain-related (PT), intra-articular (IT) and combined (CT) TMDs. The latter embodied both pain-related TMDs and intra-articular joint disorders.

2.2 | Psychological states and OHRQoL

The Chinese version of the Depression, Anxiety, and Stress Scale-21 (DASS-21) was used to evaluate psychological distress.[32] It consists of 21-items with seven questions dedicated to each negative emotional state. The items are scored on a 4-point response scale with 0 = did not apply to me at all, 1 = applied to me to some degree/some of the time, 2 = applied to me to a considerable degree/a good part of time and 3 = applied to me very much/most of the time. Total scores are calculated for each psychological state with higher scores specifying more severe depressive, anxiety or stress symptoms. Cut-off points for the various severity labels (ie normal to extremely severe) are presented in the DASS manual.[33]

OHRQoL was assessed with the Chinese version of the OHIP-TMDs[31] that contains 22-items traversing seven domains (ie functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap) based on Locker's conceptual model of oral health.[34] The items are scored on a five-point response scale with 0 = never, 1 = hardly ever, 2 = often, 3 = fairly often and 4 = very often. Total and domain OHIP-TMDs scores are computed by summing all twenty-two questions and the designated domain items, respectively. Higher total and domain OHIP-TMDs scores indicate worse/poorer and lower scores denote better OHRQoL.

2.3 | Statistical analyses

Statistical analyses were conducted with the IBM SPSS statistics for Windows software version 24.0 (IBM Corporation, Armonk, New York, USA) with the significance level set at 0.05. Categorical and numerical data were presented as frequencies with percentages and means with standard deviations as data were found to be normally distributed with *P-P* (probability-probability) plots. Chi-square test with Bonferroni post hoc test was used to compare gender and TMD diagnostic category distributions among the three age groups. One-way ANOVA and Tukey's post hoc test was performed to evaluate differences in age, psychological symptom and OHRQoL scores. Correlations between depression, anxiety, stress and total OHIP-TMDs scores for the three groups were examined using Pearson's correlations and strength of correlations was classified as weak (r_s = 0.1-0.3), moderate (r_s = 0.4-0.6) or strong (r_s = 0.7-0.9).[35]

3 | RESULTS

3.1 | Demographic data

Out of the 769 adult patients approached, 692 were suitable and consented to participation giving a response rate of 90.0%. The majority of the TMD patients were young adults (76.3%; 528/692) with middle-aged (19.7%; 136/692) and old (4.0%; 28/692) adults comprising the remaining quarter (Table 1).

3.2 | Gender and TMD subtypes

Gender and TMD diagnostic category distributions of the adult TMD cohort are shown in Table 1. A female predominance was observed for all three age groups and female-to-male distribution did not differ significantly ($P = .076$). However, the portion of TMD subtypes varied considerably between the three groups ($P < .001$). Ranking of TMD diagnostic categories by frequencies were as follows: YA group—IT > CT>PT; MA group—CT > PT>IT; OA group—CT > PT>IT. Pain-related TMDs were significantly more common in the MA and OA groups, while IT was much more prevalent in the YA group. For combined TMDs, a significant difference in proportion was observed only between the YA and MA groups (Table 1).

TABLE 1 Characteristics of the three age groups

Variables		18-44 y n = 528	45-64 y n = 136	≥65 y n = 28	*P*-values
Mean age (standard deviation)		27.82 (6.70)[a]	54.02 (5.46)[b]	70.50 (5.21)[c]	<.001*
Gender	Men n (%)	97 (18.4)	26 (19.1)	10 (35.7)	.076#
	Women n (%)	431 (81.6)	110 (80.9)	18 (64.3)	
TMD diagnostic category	Pain-related TMDs; n (%)	61 (11.6)[a]	32 (23.5)[b]	10 (35.7)[b]	<.001#
	Intra-articular TMDs; n (%)	237 (44.9)[a]	28 (20.6)[b]	4 (14.3)[b]	
	Combined TMDs; n (%)	230 (43.6)[a]	76 (55.9)[b]	14 (50.0)[a,b]	

Note: Results of one-way ANOVA* and chi-square/Bonferroni post hoc tests#. The same letter denotes no statistical difference between the groups, while different letters indicate statistical difference between the groups ($P < .05$).

3.3 | Psychological states and OHRQoL

Mean depression, anxiety and stress scores for the three age groups are displayed in Table 2. Mean depression scores ranged from 7.28 ± 9.91 to 8.64 ± 10.57 and stress scores varied from 9.93 ± 11.38 to 11.44 ± 10.23. These mean scores were within the moderate spectrum. Mean anxiety scores fluctuated from 7.79 ± 8.74 to 9.30 ± 8.34 which were in the severe classification.[33] No significant difference in psychological symptoms was observed among the three age groups ($P > .05$).

Mean total and domain OHIP-TMDs scores are displayed in Table 3. Total OHIP-TMDs scores varied between 39.92 ± 18.49 and 43.36 ± 23.36, with matured patients (ie MA and OA groups) reporting worse OHRQoL (higher scores). Besides the physical pain domain, no significant difference in total and domain OHIP-TMDs scores were identified between the three age groups. For the physical pain domain, the MA (8.85 ± 4.40) and OA (8.93 ± 5.32) groups had significantly higher scores than the YA (7.62 ± 4.49) group ($P = .009$).

Correlations between psychological symptoms and OHRQoL scores were age-dependent and appeared to be stronger with increasing age (Table 4). For the three age groups, the inter-relationships among the psychological constructs of depression, anxiety and stress were significant and strong ($r_s = 0.73$-0.92). The associations between depression, anxiety, stress and total OHIP-TMDs scores were moderately strong ($r_s = 0.47$-0.54) for the YA group. Correlation coefficients were moderate-to-strong ($r_s = 0.52$-0.67) and strong ($r_s = 0.73$-0.79) for the MA and OA groups accordingly.

4 | DISCUSSION

4.1 | Overview and methods

The present study established the proportion of matured patients seeking TMD treatment and compared their clinical diagnoses as well as psychological and OHRQoL profiles to young adult patients. In addition, it also demonstrated the inter-relationships between psychological and OHRQoL scores for the three age groups. As the proportion of middle-aged/old TMD patients (23.7%; 164/692) was considerably smaller than that of young adults (76.3%; 528/692) and significant correlations were observed between psychological symptoms and OHRQoL scores, the first and third null hypotheses were duly rejected. The second null hypothesis was accepted as there was no significant difference in DASS-21, total and most domain OHIP-TMDs scores among the three age groups. The DC/TMD was chosen as it is the current standard for TMD diagnosis and has been translated into numerous languages including Chinese. The official Chinese version of the DC/TMD used in this study is available at the International Network for Orofacial Pain and Related Methodology consortium website (https://ubwp.buffalo.edu/rdc-tmdinternational/tmd-assessmentdiagnosis/rdc-tmd/). The DC/TMD provides definitive diagnoses for pain involving the masticatory muscles and TMJs and is suitable for screening common intra-articular TMJ disorders. However, a definitive diagnosis for the latter still entails diagnostic imaging including cone-beam computerised tomography and magnetic resonance imaging.[36]

The DASS-21 is the abbreviated version of the multidimensional DASS. It contains a subset of the original 42 questions with overlapping items for the Anxiety and Stress scales removed.[33] The psychometric properties of the DASS-21 are well established and it has been translated into numerous languages and validated for different racial/cultural groups.[32,37,38] The Chinese DASS-21 employed was found to have good internal consistency (Cronbach's alpha value = 0.92) and a 6-month test-retest reliability (intra-class correlation coefficient [ICC]) of 0.46 in a large sample of Chinese college students.[32] It also showed modest convergent validity by way of moderately strong correlations with the Chinese Beck Depression Inventory ($r_s = 0.64$) and Chinese State-Trait Anxiety Inventory ($r_s = 0.41$).[32] Moreover, the DASS-21 has been used in other TMD research on patients as well as the general population.[20,21,39]

Most past TMD studies concerning OHRQoL had employed generic patient-outcome measures of which the OHIP-49 and its short-form derivative (ie OHIP-14) are most popular. Collectively, these studies indicated that OHRQoL is affected negatively by TMDs.[26] However, due to the relatively high proportion of irrelevant and infrequent items, as well as the presence of other oral conditions, the exact impact of TMDs may be concealed.[39] Some examples of items that may be inappropriate for TMDs in the OHIP-14 include questions concerning the pronunciation of words, sense of taste, self-consciousness, and/or embarrassment due to teeth/mouth/dentures. Till date, the OHIP-TMDs is the only TMD-specific OHRQoL measure put forward. It is substantially shorter than the original OHIP-49 and contains proportionally more TMD-relevant items.[30] The Chinese OHIP-TMDs used was reported to have good internal (Cronbach's alpha value = 0.92) and test-retest (ICC = 0.90) reliability.[31] Furthermore, its construct and convergent validity were also found to be good.[31]

TABLE 2 Mean DASS-21 scores (standard deviations) for the three age groups

	18-44 y	45-64 y	≥65 y	*P*-values
Depression	7.34 (9.34)	7.28 (9.91)	8.64 (10.57)	.772
Anxiety	9.30 (8.34)	7.79 (8.74)	8.86 (10.41)	.186
Stress	11.44 (10.23)	9.93 (11.38)	10.79 (12.72)	.328

Note: Results of one-way ANOVA*.

TABLE 3 Mean total and domain OHIP-TMDs scores (standard deviations) for the three age groups

	18-44 y	45-64 y	≥65 y	*p*-values
Total OHIP	39.92 (18.49)	41.29 (18.39)	43.36 (23.36)	.512
Functional limitation	5.00 (2.25)	5.18 (2.17)	4.86 (2.43)	.652
Physical pain	7.62 (4.49)[a]	8.85 (4.40)[b]	8.93 (5.32)[b]	.009*
Psychological discomfort	9.55 (4.41)	9.55 (4.19)	9.79 (4.86)	.963
Physical disability	3.91 (2.07)	3.83 (2.06)	3.93 (2.19)	.912
Psychological disability	8.24 (5.19)	8.20 (5.44)	9.32 (6.41)	.566
Social disability	2.16 (2.12)	2.26 (2.26)	2.39 (2.75)	.765
Handicap	3.43 (2.39)	3.41 (2.54)	4.14 (2.65)	.313

Note: Results of one-way ANOVA/Tukey's post hoc test*. The same letter denotes no statistical difference between the groups, while different letters indicate statistical difference between the groups ($P < .05$).

TABLE 4 Correlations of DASS-21 and total OHIP-TMDs scores for the three age groups

	Depression	Anxiety	Stress
18-44 y (youths/young adults)			
Depression	-	-	-
Anxiety	0.73**	-	-
Stress	0.79**	0.81**	-
Total OHIP	0.53**	0.47**	.54**
44-64 y (middle-aged adults)			
Depression	-	-	-
Anxiety	0.85**	-	-
Stress	0.91**	0.81**	-
Total OHIP	0.64**	0.52**	.67**
≥65 y (old adults)			
Depression	-	-	-
Anxiety	0.86**	-	-
Stress	0.92**	0.89**	-
Total OHIP	0.79**	0.74**	.73**

Results of Pearson's correlation.

**denotes statistical difference ($P < .01$).

4.2 | Gender and TMD subtypes

For all three age groups, TMDs were more common in women than men. Findings corroborated prior research that demonstrated the significance of gender in TMDs.[4,40] Bueno et al in their meta-analysis concluded that women were at two times greater risk of having TMDs compared to men.[40] The female-to-male ratios in the present study ranged from 1.8 to 4.4 for the old and young adults, respectively. Even so, gender distribution did not differ significantly between the three age groups ($P = .076$). The gender disparity was explained by genetic, hormonal, environmental, psychological and sociocultural factors as well as differences in pain perception, threshold, modulation and treatment-seeking.[40,41]

The age classification adopted paralleled that of another age-related TMD/oro-facial pain study to facilitate comparison and was coupled to data from the Baltimore Longitudinal Study of Aging.[42,43] Women of child-bearing age formed about 62% (431/692) of the total TMD cohort. This was in agreement with many other TMD studies.[4,6] Together, the results did not support the proposition that TMDs peak in the middle age in patient samples. As the peak age for TMD prevalence may differ in the Chinese general population, further large-scale epidemiological studies are still needed to oust this notion. Nonetheless, matured patients (middle-aged and old adults) formed nearly a quarter of the TMD subjects. Moreover, about 4% of all patients were aged 65 and above which was consistent with population frequencies.[9,10] Although TMDs had been postulated to be associated with menopause in older women, the current literature on the role of oestrogen in the mediation of TMJ degeneration and pain is still inconclusive.[12]

For young adult TMD patients, intra-articular TMDs without or with pain (ie IT and CT) were the major TMD conditions encountered. Pain-related TMDs in isolation affected only about 12% of young adults. The high prevalence of intra-articular joint disorders was due largely to disc displacements (86.1% and 91.7% for the IT and CT groups, respectively) and supported the inferences of systematic reviews indicating the relatively elevated frequency of disc displacements among TMD and general populations even in children and adolescents.[3,4,44] In their meta-analysis, da Silva et al reported a 16% overall prevalence of intra-articular joint disorders in children/adolescents. The most common signs were TMJ clicking (10%) and jaw locking (2.3%) which may be indicative of disc displacement without reduction (DDw/oR). TMJ DJD was present in 59.3% of joints with DDw/oR and the odds of developing degenerative joint changes was reported to be 5.3 times greater a month after the onset of TMJ closed-lock.[45] Conversely, painful TMDs (ie PT and CT) were more widespread among middle-aged and old TMD patients. The majority of these cases were still linked to intra-articular joint disorders. It could thus be inferred that intra-articular TMDs arise during adolescents and persist into adulthood with the experience of pain. Findings were congruent with tentative evidence indicating that older adults may be more sensitive to mechanically evoked pain than

younger ones.[46] The higher pervasiveness of painful TMDs in matured patients may also be contributed partly by pain chronification arising from 'altered neural manifestations'.[47] The comparative lower number of older TMD patients seeking treatment, despite increased TMJ degeneration with advancing age, had been attributed to the precedence of more severe bodily symptoms resulting from other diseases.[12]

4.3 | Psychological states and OHRQoL

Depression (state of severe low mood and dejection) and anxiety (state of apprehension or unease about impending uncertainties) often co-exist and are connected to stress and pain.[48] The strong correlations between the constructs of depression, anxiety and stress (r_s = 0.73-0.92) irrespective of age group lend additional proof of their comorbid relationships. The association between TMDs and the three psychological constructs is well established.[19-22] In the present study, mean depression and stress scores were observed to be in the moderate limit but anxiety scores were in the severe range. Findings substantiated that of Lei et al who specified that anxiety increased the likelihood of pain-related TMDs by about four folds in Chinese TMD samples.[21] No significant difference in depression, anxiety and stress were detected between the three age groups ($P > .05$). Honda et al assessed the relationship between pain and psychosocial characteristics in middle-aged and older patients with TMDs and burning mouth syndrome (BMS).[42] Although middle-aged BMS patients had significantly higher levels of depression than older ones, there was no difference perceived for TMD patients as with the current study. The latter was despite the higher chance of psychological disturbances with advancing age.[23,24]

Many studies have established the negative impact of TMDs on OHRQoL.[26] Moreover, therapeutic TMD interventions had been shown to improve the OHRQoL of patients.[49] In the present study, no significant difference in total and domain OHIP-TMDs scores was discerned with the exception of the physical pain domain. Middle-aged and older TMD patients had significantly poorer OHRQoL in this domain compared to younger ones. This finding was consistent with the higher occurrence of painful TMDs in matured TMD patients which was explained earlier. Other age-related oral changes pertaining to teeth, periodontium, oral mucosa, salivary glands, oral sensory as well as motor functions may also reduce OHRQoL.[50] Correlations between depression, anxiety, stress, and OHIP-TMDs appeared to be age-dependent. The correlation coefficients relating psychological symptoms and OHRQoL scores increased with advancing age and varied from r_s = 0.47-0.54 for young adults to r_s = 0.73-0.79 for old adult TMD patients. This may be explained somewhat by psychological, personality, health, and social changes experienced by elderly patients that influence well-being,[51] as well as psychological discomfort and disability making two of the seven subscales of the OHIP-TMDs. The presence and severity of psychological distress had also been shown to impact OHRQoL in young people.[52] Furthermore, John et al determined that psychosocial factors influenced OHRQoL more than TMD diagnoses.[53]

4.4 | Study limitations

The study had certain short-comings arising from the cross-sectional design employed. First, it only involved TMD patients that did not represent the general Chinese population. Middle-aged and old adults may avoid TMD care for several reasons, including the lack of awareness, low perceived needs, concerns over cost, and past unfavourable healthcare experiences. Future work could entail a study of the general population comprising both non-institutionalised and institutionalised old adults. Second, the causal and sequential relations between TMD diagnostic categories, psychological distress, and OHRQoL cannot be defined. A longitudinal cohort study, where TMD subjects are assessed with continuous or repeated measures over time, is needed to determine causality. This will also help address the issue of the peak prevalence of TMDs with regard to age. Third, both the DASS-21 and OHIP-TMDs are patient-administered measures and are subject to recall and reporting biases. Participation bias was not an issue considering the high response rate (90%) achieved in this study. As psychological well-being and OHRQoL may be influenced by systemic and other local oral conditions including edentulism, caries, and periodontal disease, these possible confounding factors should also be verified and analysed in future studies.

5 | CONCLUSION

Information on the age-related differences in TMD patients is still scarce. This study compared the diagnostic categories, psychological states, as well as OHRQoL among young, middle-aged, and old adult TMD patients. Although young adults formed the majority of TMD patients, approximately a quarter of the cohort were middle or old aged. Matured patients had a significantly higher prevalence of pain-related TMDs compared to younger ones. Conversely, intra-articular TMDs were significantly more common in young adults. No difference in depression, anxiety, and stress levels were observed between the three age groups despite the greater probability of psychological disturbances with advancing age. Severe anxiety was observed for all age groups. Besides the physical pain domain, no difference in total and domain OHIP-TMDs scores was observed. Matured patients perceived significantly poorer OHRQoL in this domain. Finding was consistent with the higher prevalence of pain-related TMDs in middle-aged and older patients. Correlations between psychological symptoms and OHRQoL appeared to be age-dependent.

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CONFLICT OF INTEREST

The authors have no financial or personal conflict of interests to declare relating to this article.

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