Prevalence of Psychosomatic Disorders among Dental Students with Recurrent Aphthous Stomatitis

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ABSTRACT

Aim: Therefore, the aim of this study is to determine the prevalence of psychosomatic disorders among dental students with recurrent aphthous stomatitis and to assess the level of association

Method: This is a cross-sectional study of 184 dental students with Recurrent Aphthous Stomatitis (RAS) who were at Riyadh Elm University, Riyadh, Saudi Arabia. The data analysis was performed by using Statistical Packages for Social Sciences version 21. A p-value cut off point of 0.05 at 95% Confident Interval (CI) was used to determine statistical significance. Descriptive and inferential statistics were conducted where frequency and proportion were used, to present all categorical variables. Depression, Anxiety, Stress Scale questionnaires were used to assess the depression, anxiety, and stress of RAS dental students. The analyses assessed the relationship between RAS among sociodemographic characteristics of depression, anxiety, and stress by using a chi-square test.

Results: Age range of participants was from 20 to 54 years. Of the 184 respondents, 55.4% were females and the remainder was males. Depression was prevalent among 62.5% of dental students. More than half of the respondents (58.2%) were anxious, whereas the prevalence of stress was lower at 40.2%. There was no significant relationship found between depression and RAS.

Conclusion: Age group in years and number of ulcers in each occurrence were statistically associated for anxiety and stress, and gender was also significant to anxiety. There was no significant relationship found between depression and RAS.

Key words: Psychosomatic disorders, RAS, DASS 21, Dental Students, Depression, Anxiety, Stress

INTRODUCTION

Body and mind complement each other and work as a unit. Most diseases are psychosomatic and involve the mind and body. Each physical disease has a mental component, and how an individual reacts and copes with it varies significantly Lachman (1972), Jones (1990).According to Japanese society of psychosomatic medicine (1991) defines psychosomatic illness as any physical condition involving organic or functional damage that is affected by psychological factors in the process of its onset or development [1]. The mouth signifies an organ of the expression of certain "instinctional" cravings and is charged with a high psychologic potential. The direct or indirect expression of emotions or conflicts may be the cause of certain diseases that affect the oral mucosa. Oral diseases with psychosomatic etiology have long been known in medicine, and mental or emotional factors may act as risk factors that may influence the beginning and development of oromucosal diseases Richter (2003), Nagabhushan (2004), and Sanadi (2005) [2].

The relationship between the two is explained by two hypotheses.

A specific hypothesis states that expression of a predetermined disease or illness occurs due to a certain stimulus or conflicts or stressors. The heightened response of the body that persists even after the cessation of a stimulus evoked the change and eventually results in a disease.

A nonspecific hypothesis states that generalized stress creates preconditions for a number of not necessarily predetermined diseases. According to this hypothesis, four varieties of reactions occur due to stress viz., healthy normal, neurotic, psychotic, and psychosomatic "Nagabhushan (2004)" [3].

Many authors have explained that life exists by maintaining homeostasis that is constantly confronted by intrinsic and extrinsic forces such as stressors. Favorable conditions improve the growth, development, and survival of the species. By contrast, the beginning of stress occurs during threatening situations, which are beyond the normal control of an individual, and may cause in dysphoria and finally emotional or somatic disease "Chrousos (1992), Chrousos and Gold (1992), and Tsigos and Chrousos (1994)". "Reiche stated that the stress response triggers the autonomic nervous system, primarily the sympathetic branch. This occurs through the Hypothalamic-Pituitary-Adrenal (HPA) axis, which secretes Corticotropin-Releasing Factor (CRF) and Arginine VasoPressin (AVP) [4,5]. These hormones lead to the release of Adreno Cortico Trophic Hormone (ACTH), enkephalins, and endorphins." Thus, the stress-response function acts through a positive, bidirectional feedback loop "Reiche (2004)". CRH and AVP are secreted in a circadian, pulsatile manner with approximately 2 to 3 secretory episodes per hour in non-stressful situations. In resting conditions, it peaks in early morning and progressively decreases as the day progresses. Diurnal variations are disrupted during stressful situations. The pulsations of CRH and AVP are improved during acute stress, resulting in increased ACTH and cortisol. Various other factors are also released in response to stress, such as angiotensin II, various cytokines, and lipid mediators of inflammation, which act on various components of the HPA axis, potentiating its activity "Tsigos and Chrousos (2002)".The aim of this study is to determine the prevalence of psychosomatic disorders among dental students with recurrent aphthous stomatitis and to assess the level of association [6-10].

MATERIALS AND METHODS

Ethical Approval

The study was registered with the research center, and ethical approval was obtained from the institutional review board (IRB) of Riyadh Elm University (REU). The research registration number was FPGRP/43737001/267 [11].

Study Population

The cross-sectional study targeted the dental students registered at Riyadh Elm University (REU) at all levels (undergraduate, post graduate, and interns). For this, a structured questionnaire was sent randomly by email to all targeted population. The number of respondents was 184, and the response rate was 73.6 % [12].

The exclusion criteria were subjects with special needs, pregnant women, epileptic subjects, subjects with a clinical history of psychosomatic alterations or treatment with psychoactive drugs, and individuals with history of oral surgery (except exodontia, implants, and impactions). The justified of choose exclusion criteria are All of these could be increase stress and anxiety which may affect the aim of this study [13].

Data Collection

Informed consent form and electronic questionnaire were distributed randomly by official administration email through the postgraduate office of REU. The questionnaires had three sections. The first section included demographic data including age, gender, education level, marital status. The second section contained personal information and questions related to Recurrent Aphthous Stomatitis (RAS) "shiny George (2016)". In RAS section, the subjects were asked to report the time of last ulcer experience, the frequency of the ulcer, and the number of ulcers in each occurrence, and to determine the area of occurrence [14].

The third section evaluated the aspects of depression, anxiety, and stress applying the Depression, Anxiety, and Stress Scale (DASS 21) that was introduced by "Lovibond (1995). The DASS 21 is a 21-item self-report questionnaire designed to measure the severity of a range of symptoms common to depression, anxiety, and stress. The essential function of the DASS is to assess the severity of the core symptoms of depression, anxiety, and stress. Many studies

among different populations confirmed that the DASS is comprehensible and sensitive to detecting common mental disorders "(Tran et al., (2013)", and is a reliable and valid method of assessing features of depression, anxiety, and tension-stress "Martin M. Antony, Bieling, Swinson, Cox and Enns (1998)" [15].

Statistical Analysis

The data analysis performed by using Statistical Packages for Social Sciences (SPSS) version 21.A p-value cut off point of 0.05 at 95% CI used to determine statistical significance. Both descriptive and inferential statistics had been conducted where frequency and proportion had been used to presents all categorical variables. DASS 21 was used as questionnaires to assess the depression, anxiety, and stress of dental students with RAS. Based on the given criteria, the answer options for each question was from 0 = Did not apply to me at all,1 = Applied to me to some degree or some of the time, 2 = Applied to me to a considerable degree, or a good part of time , 3 = Applied to me very much, or most of the time.

DASS 21 was divided into three equal parts for depression, anxiety, and stress (seven questions each), each predictor has an equal total score of 21 points, and the summed score was multiplied by 2 to obtain a total score of 42 points "Lovibond (1995)". Normal categories (not depressed, not anxious, not stressed) were classified by the score range of 0 to 9 and categories with a mental disorder (depressed, anxious, stressed) were classified by the score range of 10 to 42 or from mild to extremely severe, as suggested by "Lovibond (1995)". The analyses assessed the relationship between RAS among sociodemographic characteristics and DAS by using a chi-square test [16].

RESULTS

There were 184 dental students that voluntarily enrolled in this study. Age range was from 20 to 54 year, of whom the ≤25-years-of-age group was slightly higher compared with the >25-years-of-age group. Of the 184 respondents, 55.4% were female and the remainder was males. Of the participants, 37% were post graduate students, followed by clinical level students (28.8%), interns (17.4%), and pre-clinical students (16.8%). The majority of the group were single

(64.1%) compared with married (35.9%). Regarding time of last ulcer, 57.1% occurred more than 6 months previously, 9.8% occurred 6 months previously, 12% occurred within the last 3 months, 12.5% occurred in the previous month, and 8.7% presently occurred. Many respondents had recurrence of ulceration once in more than 6 months previously (66.3%), followed by once in 6 months previously (13.6%), and the remaining had a single recurrence once in 3 months and once in 1 month. Additionally, 79.9% of the respondents had a one-time recurrence, 13% had a recurrence three to six times, and 7.1% had a recurrence more than six times, and the most common areas in ascending order were lips, cheek, gingiva, and tongue, including multiple areas [Table 1] [17].

The prevalence of DAS among dental students is presented in [Table 2]. Based on the DASS 21 assessment, the majority of the respondents had normal results for depression, anxiety, and stress [Figure 1]. Notably, depression was dominant among dental students and accounted for 115 (62.5%), and no depression was relatively less, 69 (37.5%) [18]. The criteria for anxiety was identical to that of depression (anxious=10–42, not anxious=0–9 points) and the result revealed that more than a half of the respondents were anxious 58.2% (107) compared with not anxious with 41.8% (77), whereas the prevalence of stress followed the same pattern (stressed=10–42, not stressed 0–9 points) where it was found that "stressed" was lower, 74 (40.2%), compared to "without stress", 110 (59.8%).

In the relationship between DAS among sociodemographic characteristics and RAS, a significant difference was found at the level of anxiety (p-0.029) and level of stress (p-0.026) among age groups in years, but no statistical difference on level of depression (p-0.0236) was observed. Gender was statistically significant at the level of anxiety (p-0.004); however, no relationship was found at level of depression (p-0.193) and level of stress (p-0.132). Number of ulcers in each occurrence shows a significant [19] relationship for level of anxiety (p-0.014) and level of stress (p-0.007) but negative for the level of depression (p-0.077). There was also found a negative relationship at the level of DAS for the following variables: educational level, marital status, time of last ulcer, and frequency of ulceration [Table 3].

Table 1: Sociodemographic characteristics of and recurrence of ulceration in the study group.

Study Variables	N (%)(n=184)
Age group in years	
≤25 years old	101 (54.9%)
>25 years old	83 (45.1%)
Gender	
Male	82 (44.6%)
Female	102 (55.4%)
Educational Level	
Pre-clinical level	31 (16.8%)
Clinical level	53 (28.8%)
Intern	32 (17.4%)
Post graduate	68 (37.0%)
Marital Status	
Single	118 (64.1%)
Married	66 (35.9%)
Time of last ulcer	
Experiencing presently	16 (08.7%)
Occurred last 1 month	23 (12.5%)
Occurred last 3 months	22 (12.0%)
Occurred last 6 months	18 (09.8%)
Occurred more than 6 months	105 (57.1%)
Frequency of ulceration	
Once in a month	16 (08.7%)
Once in 3 months	21 (11.4%)
Once in 6 months	25 (13.6%)
Once in more than 6 months	122 (66.3%)
Number of ulcer in each occurrence	
One time	147 (79.9%)
3–6 times	24 (13.0%)
>6 times	13 (07.1%)
Area of occurrence	
Cheek	41 (22.3%)
Gums	32 (17.4%)
Lips	61 (33.2%)
Tongue	21 (11.4%)
Multiple areas	29 (15.8%)

Table 2: Prevalence of DAS among patients with RAS.

Factor	N (%)(n=184)
Depression	
Depressed	115 (62.5%)
Not depressed	69 (37.5%)
Anxiety	
Anxious	107 (58.2%)
Not anxious	77 (41.8%)
Stress	
Stressed	74 (40.2%)
Not stressed	110 (59.8%)

DAS – Depression, Anxiety, Stress; RAS – Recurrent Aphthous Stomatitis
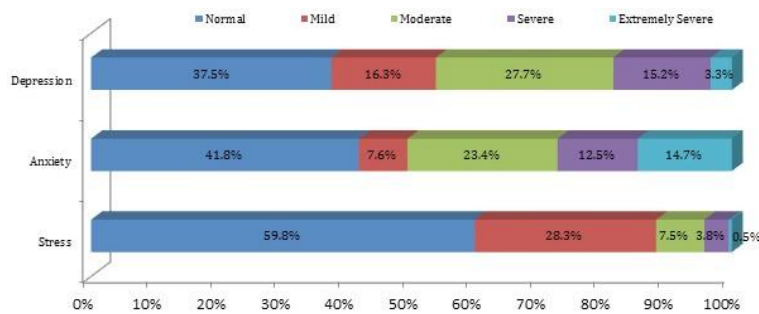

Figure 1: Distribution of DAS.

Table 3: Relationship between DAS among sociodemographic characteristics and RAS.

Factor	Level of Depression		Level of Anxiety		Level of Stress	
	Depressed	**ND**	**Anxious**	**NA**	**S**	**NS**
	N (%)(n=115)	N (%)(n=69)	N (%)(n=107)	N (%)(n=77)	N (%)(n=74)	N (%)(n=110)
Age group in years						
≤25 years old	67 (58.3%)	34 (49.3%)	66 (61.7%)	35 (45.5%)	48 (64.9%)	53 (48.2%)
>25 years old	48 (41.7%)	35 (50.7%)	41 (38.3%)	42 (54.5%)	26 (35.1%)	57 (51.8%)
P value	0.236		0.029 **		0.026 **	
Gender						
Male	47 (40.9%)	35 (50.7%)	38 (35.5%)	44 (57.1%)	28 (37.8%)	54 (49.1%)
Female	68 (59.1%)	34 (49.3%)	69 (64.5%)	33 (42.9%)	46 (62.2%)	56 (50.9%)
P value	0.193		0.004 **		0.132	
Educational Level						
Pre-clinical level	19 (16.5%)	12 (17.4%)	18 (16.8%)	13 (16.9%)	14 (18.9%)	17 (15.5%)
Clinical level	34 (29.6%)	19 (27.5%)	32 (29.9%)	21 (27.3%)	22 (29.7%)	31 (28.2%)
Intern	22 (19.1%)	10 (14.5%)	24 (22.4%)	08 (10.4%)	16 (21.6%)	16 (14.5%)
Post graduate	40 (34.8%)	28 (40.6%)	33 (30.8%)	35 (45.5%)	22 (29.7%)	46 (41.8%)
P value	0.8		0.093		0.337	
Marital Status						
Single	74 (64.3%)	44 (63.8%)	74 (69.2%)	44 (57.1%)	52 (70.3%)	66 (60.0%)
Married	41 (35.7%)	25 (36.2%)	33 (30.8%)	33 (42.9%)	22 (29.7%)	44 (40.0%)
P value	0.937		0.094		0.154	
Time of last ulcer						
Presently	13 (11.3%)	03 (04.3%)	10 (09.3%)	06 (07.8%)	09 (12.2%)	07 (06.4%)
Last 1 month	14 (12.2%)	09 (13.0%)	11 (10.3%)	12 (15.6%)	10 (13.5%)	13 (11.8%)
Last 3 months	16 (13.9%)	06 (08.7%)	14 (13.1%)	08 (10.4%)	10 (13.5%)	12 (10.9%)
Last 6 months	13 (11.3%)	05 (07.2%)	13 (12.1%)	05 (06.5%)	11 (14.9%)	07 (06.4%)
Last >6 months	59 (51.3%)	46 (66.7%)	59 (55.1%)	46 (59.7%)	34 (45.9%)	71 (64.5%)
P value	0.205		0.552		0.091	
Frequency ulceration						
Once in a month	11 (09.6%)	05 (07.2%)	11 (10.3%)	05 (06.5%)	08 (10.8%)	08 (07.3%)
Once in 3 months	15 (13.0%)	06 (08.7%)	11 (10.3%)	10 (13.0%)	11 (14.9%)	10 (09.1%)
Once in 6 months	17 (14.8%)	08 (11.6%)	16 (15.0%)	09 (11.7%)	09 (12.2%)	16 (14.5%)
Once in >6 months	72 (62.6%)	50 (72.5%)	69 (64.5%)	53 (68.8%)	46 (62.2%)	76 (69.1%)
P value	0.586		0.681		0.487	
Number of ulcer in each occurrence						
One time	87 (75.7%)	60 (87.0%)	78 (72.9%)	69 (89.6%)	51 (68.9%)	96 (87.3%)
3–6 times	20 (17.4%)	04 (05.8%)	20 (18.7%)	04 (05.2%)	16 (21.6%)	08 (07.3%)
>6 times	08 (07.0%)	05 (07.2%)	09 (08.4%)	04 (05.2%)	07 (09.5%)	06 (05.5%)
P value	0.077		0.014 **		0.007 **	

N = Depressed, ND = Not Depressed, A = Anxious, NA = Not Anxious, S = Stress, NS = Not Stressed

DISCUSSION

The current study investigated RAS and its association with psychosomatic disorders. The findings have thus contributed to articles that have investigated the phenomena of this oral mucosal condition. Several articles on Saudi Arabia and countries abroad have associated RAS with different symptoms and with psychological factors. In this study, we aimed to analyze psychological factors and how they affected patients with RAS; Thereby establishing the level of association between RAS and Psychosomatic disorder [20-22].

Depression Associated with RAS

Some investigators have theorized that stress during student life is a major factor in RAS,

although the difference in age groups should be considered as well Chavan et al., (2012). Depression, Anxiety, and Stress (DAS) are psychosomatic disorders that have a significant influence on RAS are elaborated on in this study. Incidence of depression among dental students in this study was high (62.5%). The prevalence of depression among patients with RAS had also been discussed Ajmal et al., (2017), Pakfetrat et al., (2014), Dangore(2016), Gavic et al., (2014) Polat et al., (2018). Ajmal et al. published a study titled 'Prevalence and Psychological Stress in Recurrent Aphthous Stomatitis among Female Dental Students in Saudi Arabia Ajmal et al., (2017)" and analyzed depression and anxiety among dental students using the

Hospital Anxiety and Depression Scale (HADS) questionnaire. They reported that 65% of the students had depression, which was comparable to the finding in this study. In India, prevalence of depression among patients with RAS was relatively low (26.7%) Dangore (2016). Although consideration of study subject plays pivotal role because this author studied the psychological disorders of patients with RAS, Burning Mouth Syndrome (BMS), and oral lichen planus (OLP), and this paper focused on RAS with dental students [23-25].

Anxiety Associated with RAS

Moreover, another crucial member of psychosomatic illness is anxiety. In this study, more than half of the respondents were anxious, 58.2%. This finding is consistent with papers published locally and abroad "Gavic et al., (2014), Pakfetrat et al., (2014), Dangore (2016), Alrashdan and AlKhader (2017), Rezaei et al., (2017), Ajmal et al (2018), Ge (2018), Nadendla et al., (2015), Polat et al (2018). The highest rates of anxiety disorder among patients with RAS were reported by Ajmal and associates Ajmal et al., (2018). They reported 88% of the female dental students were suffering from anxiety, which was far off distant compared with the finding of this study. Notably, a study from Croatia registered the lowest prevalence of anxiety, 26.5% Gavic et al., (2014). Additionally, Alrashdan and Alkhader (2017) observed that patients with persistent RAS often had elevated anxiety levels [26-28].

Stress Associated with RAS

Stress resulting from student life may be the precipitating factor for the higher prevalence of RAS in a cohort of professional students Miller and Ship (1977). The prevalence of stress in this study was 40.2%, which was lower than in those without stress. Articles on the same subject have discussed stressful events in various forms Huling et al., (2012), Huling et al., (2013), Patil et al., (2014), Gavic et al., (2014), Dangore et al., (2016), George and Joseph, (2016), Aslam et al., (2017), Rezaei et al., (2017), Alrashdan and AlKhader, (2017), Ajmal et al(2018), Ge, (2018). The highest incidence of stress among patients with RAS was recorded by Ajmal et al., (2018). They reported that 90% of patients with RAS were exposed to stress. This finding is contrary to the findings of Dangore who reported only 10% with stress Dangore, (2016).

The present paper is in agreement with Gavic et al., (2014). They reported that 44.1% of the patients with RAS reported stress. Huling et al. (2012), Alrashdan and AlKhader (2017) have related RAS to stressful events. Al Rashdan and Alkhader (2017) remarked that experiencing a stressful life event increased the incidence of an RAS episode by almost three times, and mental stressors had a larger effect than physical stressors on the occurrence of RAS episodes [29-33].

Measurement of Psychosomatic Disorder among patients with RAS

Psychosomatic disorder is one of the most significant factors that influenced patients with RAS. Psychosomatic disorder affects physical and mental health and could affect the progression of oral mucosal disorders. Many studies have demonstrated that in most of the oral problems such as chronic pain disorders, BMS, and RAS, mental health plays a vital role in their pathogenesis. Thus, mental state evaluation is necessary to assess if oral illness is affecting the physical and emotional being of the patient. This study measured the psychosomatic disorder of patients with RAS by using (DASS) 21 questionnaires developed by Lovibond (1995) because this scale measures and assesses three types of psychosomatic disorders (depression, anxiety, and stress) simultaneously. Researchers have evaluated psychosomatic disorders among patients with oral problems Huling et al., (2012), Huling et al.,(2013), Gavic et al.,(2014), Technow et al.,(2015), George and Joseph.,(2016), Goracci et al.,(2016), Tadakamadla, (2017), Rezaei et al., (2017), Ajmal et al., (2018), Lee et al., (2018), Nadendla et al., (2018), Polat et al.,(2018), Senusi et al.,(2018). However, each of these papers used different tools to measure the mental states of the patients. Tools such as the Patient Health Questionnaire (PHQ), Young Mania Rating Scale (YMRS), Work and Social Adjust Scale (WSAS), Clinical Global Impression Scale (CGI), Pittsburg Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Short Form (SF), Paffenbarger Physical Activity Questionnaire (PPAQ), General Anxiety Disorder (GAD), Perceived Stress Scale (PSS), Rosenberg Self-esteem Scale (RSES), Positive Affect and Negative Affect Schedule (PANAS), Oral Health Impact Profile (OHIP), Recent Life Changes Questionnaire (RLCQ), Child Depression Inventory (CDI), Adolescent

Life Events Questionnaire (CDI), Schedule for Affective Disorders and Schizophrenia for School-Age Children (KSADS), Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI), WCQ – Ways of Coping Questionnaire (WCQ), Hamilton Anxiety Scale (HAS), Hamilton Depression Rating Scale (HDRS), and RLCQ have all been used to determine the psychological disorder of a patient with oral pathogenesis at a certain time. Based on my assessment, the most common tool used among patients with RAS with a psychological disorder is the HADS, developed by Zigmond et al. (1983), In this study, DASS 21 was used because it addressed anxiety, depression and stress [34-37].

LIMITATIONS

The generalization of this study is subject to limitations. First, the findings could be more beneficial if the associated diseases were indicated in a specific manner, similar to the aforementioned articles, adding to the substantiality of this paper. Second, to create a comprehensive overview of psychosomatic disorder and its effect on patients with RAS, adding more variables in the baseline characteristics would be ideal, such as RAS duration and number of RAS episodes. Last, increasing the sample size would indicate be most changes, because this would provide significant results that could provide additional information regarding the phenomena of this study subject because in any study of this type the higher the number of study subjects, the higher the power of study to detect significant changes.

CONCLUSION

More than half of the dental students with RAS were either depressed or anxious; with the incidence of stress being considerably less than that. Age group in years and number of ulcers in each occurrence were statistically associated with anxiety and stress, and gender was also a significant factor for anxiety. However, this paper found no significant relationship between depression and RAS. This finding does not exclude the possibility that depression and anxiety are the most influential factors in patients with RAS. In this regard, this issue must be addressed in future studies to further manage the development of RAS where a specialist in psychosomatic disorders plays a vital role in coping with this type of disorder. In the management of RAS, traditional and conventional methods could be used to shorten the duration of the healing time or at least temporarily relieve pain.

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