

# Fundamental Concept of Psychosomatic Disorders: A Review

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## ABSTRACT

The term psychosomatic is derived from Greek word “psyche” (mind) and “soma” (body). A psychosomatic disorder is a disease which involves both mind and body. Sometimes mental and emotional factors may act as risk factor that could influence the initiation and progression of oro-mucosal disorders. Several studies have been showed that in most of the oral problems like chronic pain disorders, burning mouth syndrome etc, psychological factors plays a major role in their pathogenesis. This review highlights the important aspects of the psychosomatic diseases affecting oral cavity. The review article has been prepared doing a literature review from the text books, World Wide Web and pubmed/medline.

**Key words:** Psychosomatic disorders, Oro-mucosal diseases, Psyche, Soma, Emotional factors.

## INTRODUCTION

German psychiatrist Heinroth was first to use the term “Psychosomatic” in 1818. In 1922 Felix Deutsch introduced the term “psychosomatic medicine”. Psychosomatic disorders are the consequences of harmful effects that result from psychic influences on the organic control of tissues.

The oral cavity is connected specifically or emblematically to the significant human senses and interests.

Psychosomatic disorders are defined as disorders characterized by physiological changes that originate, at least in part, from emotional factors.<sup>1,2</sup>

The term psychosomatic disorders defines the bodily ailment due to mental or enthusiastic unsettling influence in which psychological stress affect antagonistically physiological (somatic) working to the point of distress.

DSM-II 1968 defined psychosomatic disorders as “psychosomatic symptoms that are caused by emotional factors and involve a single organ system usually under autonomic nervous system innervations.”<sup>3,4</sup>

Term psychosomatic is derived from Greek word “psyche” (mind) and “soma” (body). In ancient times, “psyche” meant “soul or mind” and recently it has been referred to as behaviour. Soma implies the body of organism. It is used to refer to a variety of concepts from diseases to biopsychosocial research to consultation liaison work and is frequently used to depict illness in a pejorative way.<sup>5</sup>

Mental states impact body organs through a amalgamation of three interrelated components: neural, hormonal, and immunologic. By conscious command of brain, the motor neurons are responsible for the voluntary movements like clenching of teeth. Under the stress clenching of teeth intervened by same motor neurons may likewise happen, yet the act may not be voluntary and conscious. Hypothalamo-pituitary-adrenal axis and sympathetic nervous system get activated in response to stress that further results in decrease immune response. Decrease in T-lymphocyte activity in stress

may not be mediated by hormones. Because of activation of corticosteroid, the immune mechanism may be suppressed. Individual specific, however unpremeditated, conditioning of specific clash or stress to particular bodily malfunction might be a vital psychosomatic system. In spite of the fact that the immune system shields the body from the pathogens, it is affirmed that introduction to stress and excitation can diminish the immune system against the foreign bodies. It appears that the presentation to upsetting circumstances in life, like seclusion, will diminish the immune system of body.<sup>3</sup>

## PSYCHE AND SOMA ???

There are two concepts/hypothesis to explain the relationship between “Psyche” and “Soma”

### 1- Specific hypothesis

Suggests that specific emotions conflicts and personality constellation led to specific cell and tissue damage.

If a specific stimulus, emotional conflict or stress occurred, it expressed itself in a specific response or illness in genetically predetermined organ.

After stress is suppressed through the ANS, however the sympathetic responses may remain alert for heightened aggression or flight or parasympathetic nervous system responses may be altered for increase vegetative activity. Such prolonged alertness and tension can produce physiological disorders and eventually pathology of organs or viscera. E.g peptic ulcer.

### 2 - Non specific hypothesis

Suggests that generalized stress created the preconditions for a number of not necessarily predetermined diseases. According to this hypothesis four types of reactions takes place due to stress:

- The Neurotic:** In which alert signal of anxiety is too great, the defence fails.
- The Psychotic:** On which alarm may be misperceived or even ignored.

- c. **Healthy Normal:** On which alertness is followed by an action of defence.
- d. **The Psychosomatic:** In which defence by the psyche becomes ineffective and alertness is translated in to somatic symptoms causing changes in body tissue.<sup>4</sup>

## CLASSIFICATION OF PSYCHOSOMATIC DISORDERS

According to international classification of diseases psychosomatic disorders can be classified depending on whether or not there is tissue damage:

A - "Psychological malfunction arising from mental factors", it describes assortments of physical manifestations or sorts of psychological malfunctioning of mental origin not involving the tissue damage and usually mediated through the autonomic nervous system(ANS). Include in this category are respiratory disturbances e.g. hyperventilation, psychogenic cough, cardiovascular disturbances such as cardiac neurosis, skin disorders such as pruritis.

B - If there is tissue damage and psychological factors are associated with disease process the following definition is used: mental unsettling influences or psychic components of any sort might be thought to have had a noteworthy impact in the etiology of certain physical conditions more often involving tissue damage.

Included under this latter designation are psychogenic conditions such as asthma, dermatitis, eczema, gastric ulcer mucous colitis, ulcerative colitis, and urticaria.<sup>6</sup>

In 1978 Zegarelli.E.V., Kutscher.A.H and HYMAN. G.A classified the psychosomatic disorders as follows-

1. Psychoneurotic disorder
2. Psychophysiologic disorder
3. Personality disorder.
4. Psychotic disorder
1. **Psychoneurotic** – basic characteristic – is subject feeling of anxiety. Type of neurosis –
  - Phobic
  - Obsessive
  - Depressive
  - Conversion
2. **Psychophysiologic** – Distress – renders the individual to physiologic dysfunction and eventual tissue damage, rather than neurotic defences or psychotic withdrawal.
3. **Personality** – The individual utilizes patterns of action or behaviour rather than mental, somatic or emotional symptoms.
4. **Psychotic** – Characterized by personality disintegration with failure in the ability to perceive, evaluate and test reality.<sup>7</sup>

## CLASSIFICATION OF ORAL PSYCHOSOMATIC DISEASES

In 1980 Mc. Carthy P.L and Shklar.G. classified the oral psychosomatic disorders as follows-

1. **Oral psychosomatic diseases**
  - Lichen planus
  - Aphthous ulcers
  - Stomatitis Acreta Migrans and glossitis

2. **Oral diseases in which psychological elements may assume some etiologic part:**
  - Erythema Multiformae
  - Mucous membrane pemphigoid.
  - Chronic periodontal disease.
3. **Oral infection in which emotional stress serves as a predisposing factor:**
  - Recurrent herpes labialis
  - Necrotizing gingivitis
4. **Oral diseases induced by neurotic habits:**
  - Leukoplakia.
  - Biting of oral mucosa
  - Physical/mechanical irritation.
  - Dental /periodontal disease produced by bruxism.
  - Oromucosal pain
  - Glossodynia
  - Dysgeusia.
  - Neurotic oral symptoms.<sup>8</sup>

According to simple working type classification oral psychosomatic disorders are classified as:

- I. **Pain related disorders**
  1. Myofascial pain dysfunction syndrome (MPDS)
  2. Atypical facial pain
  3. Atypical odontogenic pain
  4. Phantom pain
- II. **Disorders related to altered oral sensation**
  1. Burning mouth syndrome
  2. Idiopathic xerostomia
  3. Idiopathic dysgeusia
  4. Glossodynia
  5. Glossopyrosis
- III. **Disorders induced by neurotic habits**
  1. Dental and periodontal diseases caused by bruxism
  2. Biting of oral mucosa (self mutilation)
- IV. **Autoimmune disorders**
  1. Oral lichen planus
  2. Recurrent aphthous stomatitis
  3. Psoriasis
  4. Mucous membrane pemphigoid
  5. Erythema multiforme
- V. **Miscellaneous disorders**
  1. Recurrent herpes labialis
  2. Necrotising ulcerative gingivostomatitis
  3. Chronic periodontal diseases
  4. Cancerophobia<sup>2</sup>

According to Jones And Mason

- I **Psychopathology and personality disorders**
  - A **NEUROSIS**
    - Anxiety states
    - Phobic states
    - Obsession states
    - Hysterical neurosis
    - Depressive neurosis.
    - Neurasthenia
    - Hypochondriac neurosis.

**B PSYCHOSIS**

Affective psychosis  
Schizophrenia  
Paranoid states.

**II PERSONALITY DISORDERS**

Paranoid  
Affective  
Schizoid  
Explosive  
Anankastic  
Hysterical  
Antisocial.

**III PSYCHOSOMATIC DISORDERS****A: Pain**

Facial arthomyalgia  
Atypical facial neuralgia  
Atypical odontalgia  
Psychotic pain

**B: Oral and facial sensory disturbance**

Oral dysaesthesia  
Disturbance in taste and salivation.  
Facial anaesthesia

**C: Intractable pain and dysaesthesia****IV SOMATOPSYCHIATRIC PROBLEMS:****A: Oral ulceration:**

Aphthous ulcers  
Stomatitis artefacta

**B: Recurrent subluxation****C: Persistent trismus<sup>9</sup>**

**Bailoor and Nagesh in 2001 classified oral psychosomatic disorders as follows:**

**1. Pain-related disorders**

- a. Myofacial pain dysfunction syndrome
- b. Atypical facial pain

**2. Disorders related to altered oral sensation**

- a. Burning mouth syndrome
- b. Idiopathic xerostomia
- c. Idiopathic dysguesia

**3. Miscellaneous**

- a. Oral lichen planus
- b. Recurrent aphthous ulcers
- c. Psoriasis
- d. Erythema multiforme
- e. Cancerophobia
- f. Acute necrotizing ulcerative gingivitis
- g. Anorexia nervosa
- h. Bruxism.<sup>10</sup>

**RESPONSE OF BODY TO STRESS**

Stress can be defined as physiological response that serves as a mechanism of mediation linking any given stressor to its target-organ effect. Various psychological disorders are caused by stress. Hans Seyle coined the term "stress" and he observed many highly diverse ways of perturbing the organism resulted common physiological responses. Walter and Cannon established the relationship between emotional

stress and autonomic nervous system.<sup>4,11</sup>

**PHYSIOLOGIC RESPONSE**

Release of certain neurotransmitter like catecholamines, particularly those known as dopamine, norepinephrine, and epinephrine (also called adrenaline).

*Release of Neuropeptide S.*

Release of CRF, glutamate and GABA.<sup>12</sup>

**ENDOCRINAL RESPONSE**

Stress act as stimulator for the hypothalamic-pituitary-adrenal axis that leads to increase level of corticosteroid levels. These increased corticosteroid levels have anti-stress effect. (Figure:1)<sup>4</sup>

**IMMUNOLOGICAL RESPONSE**

Firdaus S reviewed the immune effects of biological stress responses that can be induced by psychological, physiological, or physical (including exercise) stressors. He stated that short term effect is responsible for the enhancement of innate or primary and adaptive or secondary immune responses during immune activation. Immune system enhancement leads to alterations in dendritic cell, neutrophil, macrophage, lymphocyte trafficking, maturation and function as well as local and systemic production of cytokines. Innate and adaptive immune response get suppressed or dysregulated due to modifications in Type 1-Type 2 cytokine balance, inducing low-grade chronic inflammation, and suppressing numbers, trafficking, and function of immunoprotective cells. Constant anxiety may likewise build weakness to a few sorts of disease by suppressing Type 1 cytokines and defensive T cells and increasing regulatory/suppressor T cell function.<sup>13</sup>

**MEDICALLY UNEXPLAINED ORAL SYMPTOMS**

Toyofuku A suggested that patients with "oral psychosomatic disorders" are reluctant to accept diagnosis due to insinuation that the problem is psychogenic. Therefore, the use of another term, "medically unexplained oral symptoms" (MUOS) is preferable. He reported that the estimated prevalence of MUOS among dental patients ranges from 5 to 10% or more [2]. Representative medically unexplained oral symptoms are as follows:

1. Burning Mouth Syndrome (BMS)
2. Atypical Odontalgia (AO)
3. Oral Cenesthopathy (Oral Dysesthesia)
4. Halitophobia (Olfactory reference syndrome)
5. Occlusal discomfort (Phantom Bite Syndrome)
6. Odontophobia (Dental Phobia)<sup>14</sup>

**DIAGNOSIS****STRESS BIOMARKERS**

Biomarkers are most effective tool for assessment of stress. These are:

1. Metabolic markers.
2. Neuroendocrine biomarkers
3. Immune system markers

**Metabolic markers**

Metabolic changes are easily quantifiable and can be used as

biomarkers for chronic stress. Cholesterol levels, Albumin, Waist-Hip ratio and Glycosylated hemoglobin are some of the parameters which quantify change in metabolism and can be used as markers of chronic stress.

The normal range of serum cholesterol is 120–250 mg/dL. Various studies have suggested that under chronic stress serum cholesterol levels get decreased.

Low serum cholesterol levels have also been observed in persons who suffered from accidents, persons showing aggressive behavior and in depression patients.<sup>15,16</sup>

Serum albumin is the most abundant protein in mammals. Chronic stress, via various inflammatory or neuroendocrine mediators, could reduce albumin levels by either increasing the rate of degradation, or by reducing the rate of synthesis. The normal range is 3–6 g/dL.<sup>17</sup>

Waist-hip ratio tends to be higher for chronically stressed individuals. Bjorntorp and Scriver have suggested that greater vulnerability to stress increases exposure to stress-induced cortisol, which in turn fuels central fat deposition. It is utilized as a pointer of leanness which thusly is a hazard factor for more genuine wellbeing conditions.<sup>18,19</sup>

Glycosylated hemoglobin is hemoglobin to which glucose is bound. Chronic stress is linked to hyperglycemia. This has been explained to be caused either due to the presence of excessive counter-regulatory hormones like glucagon, glucocorticoids, etc. or due to high circulating or tissue levels of cytokines, particularly TNF- $\alpha$  and IL-1, which interfere with the functioning of insulin [54]. Hyperglycemia results in elevated levels of glycosylated hemoglobin in chronically stressed individuals.<sup>20</sup>

### Immunological biomarkers

Change in circulating level of cytokines can be used as biomarkers like IL-6, TNF- $\alpha$ , CRP, and IGF-1. Sheng et al suggested that chronically stressed individuals are biased toward a humoral immunity oriented cytokine production, for unknown reasons. IL-1 or IL- $\alpha$  act as stimulators for production of IL-6. Stress causes the release of IL-1. A properly functioning HPA axis prevents the peripheral release of IL-6 following acute stress. But due to the dysregulation of the HPA axis and a resistance to the immunosuppressant effects of glucocorticoids seen in chronic stress, there may be a decrease in the ability of the HPA to prevent peripheral inflammation which accounts for individuals suffering from chronic stress showing increased systemic levels of IL-6.<sup>21,22</sup> TNF- $\alpha$  levels have been reported to be increased in adults aged 19–55, under chronic stress [64]. TNF- $\alpha$  promotes gene expression by activating NF $\kappa$ B which results in the transcription of inflammatory cytokines. Hence, an elevation in TNF- $\alpha$  is concomitant with elevation in the levels of IL-1 and IL-6. The mRNA of TNF- $\alpha$  is higher during chronic stress, which suggests *de novo* synthesis rather than the release of preformed inducible protein upon activation of lymphocytes and macrophages. The levels of spontaneously produced TNF- $\alpha$  are also reported to be higher in persons suffering from chronic stress, as compared to controls.

Fulgini, A.J., et al. conducted a study on adolescents, under chronic stress, CRP levels have been suggested to rise. CRP can be measured from blood and has been successfully used in epidemiology studies as a marker of the chronic

inflammatory response caused by chronic stress. Some sex differences have been reported with women showing higher CRP levels than men, however, the level of CRP has been reported to rise in both the sexes with exposure to chronic stress.

IGF-1 or Insulin-like growth factor-1 is a hormone with a structure similar to insulin, synthesized by the liver and other cell types. In adults under chronic stress, higher than normal levels of cortisol have been suggested to result in low levels of IGF-1.<sup>23,24,25,26,27</sup>

### Neuroendocrine biomarker

Neuroendocrine factors are effective as biomarkers for stress because, the neuroendocrine system is the first to respond to a given stressor, and coordinates the response of many other physiologic systems to the stressor, including cardiovascular and immune systems, as well as energy production and/or utilization and behavior, therefore bringing the body back to homeostasis.

The various neuroendocrine biomarkers are - Cortisol, Dehydroepiandrosterone, Adrenaline, Noradrenaline, Dopamine, and Aldosterone.<sup>28</sup>

Studies conducted on healthy adults suggested that chronic stressors that threaten physical integrity, are uncontrollable, or involve trauma tend to result in a high flat diurnal profile of cortisol release, with lower than normal levels in the morning and higher than normal levels in the evening and controllable chronic stressors tend to produce higher than normal morning levels of cortisol.<sup>29</sup>

Dehydroepiandrosterone (DHEA) is an androgen synthesized by the adrenal glands. It functions as a HPA axis antagonist. In healthy adults, in response to a chronic stressor, the dehydroepiandrosterone levels have been reported to fall during the hyper-responsive stage of the HPA axis. Even though cortisol production is attenuated once the shift to the hypo-responsive stage of the HPA axis occurs, DHEA levels have been shown to continue to drop.

Adrenaline is released as a result of sympathetic nervous stimulation of the adrenal medulla, usually in response to stress. Chronically stressed individuals have been reported to show low adrenaline responsiveness due to habituation to constant adrenaline induced signaling.<sup>30,31</sup>

Acute stress in healthy adults has been reported to cause an elevation of adrenaline levels, but this is due to increase in production. Due to this reason, it is difficult to attribute the rise in adrenaline levels to acute or chronic stressors.

Noradrenaline is a neurotransmitter that has widespread effects across multiple brain areas. In adult humans have suggested that there is a decrease in the release of brain noradrenaline under chronic stress.

Acute stress has been reported to cause an elevation in both plasma and brain noradrenaline levels.<sup>32,33,34</sup>

Recreational drug use and later abstinence, exposure to chemicals like PCBs, exercise, obesity, feeding habits, etc influence dopamine levels. Hence, the use of dopamine alone as a biomarker of chronic stress is not reliable. When used in conjunction with other markers as part of the allostatic load model, it can be one of the useful biomarkers for quantifying stress response.<sup>35,36</sup>

Acute stress is reported to cause an elevation in aldosterone

secretion. The standalone use of aldosterone as a biomarker for chronic stress is unreliable because smoking, diet, etc. influence aldosterone levels.<sup>37,38</sup>

### Social Readjustment Rating Scale (SRRS)

This scale was developed in 1967 by Holmes and Rahe. This scale involves 43 life events such as marriage, death of spouse, or birth of child. The subject of investigation reports which event has occurred during either the past 6 months or the past year.<sup>6</sup>

### Psychiatric And Pain Rating Scales

In order to support the clinical diagnosis and in absence of any neurotransmitter assay, the clinician has to resort to rating scale questionnaires, measuring behavior and symptoms. Psychiatric rating scales are completed either by the patient (self rating) or the clinician (observer rating).

The most common forms are:

- 1) 'Case finding' instruments
- 2) Mood check list.
- 3) Personality scales.
- 4) Life event scales.
- 5) Illness behavior.
- 6) Pain.<sup>39</sup>

### Oral Dysesthesia Rating Scale

Oral dysesthesia rating scale (oral DRS) developed by Uezato A et al and he

evaluated its validity and reliability as an assessment tool. Inter-rater reliability of Oral DRS was evaluated by pairs of raters administered the scale to 40 randomly selected patients with complaints of oral dysesthesia symptoms and Cohen's weighted kappa coefficient was determined for each item. The scale assesses the severity of feelings of foreign body [A1], exudation [A2], squeezing-pulling [A3], movement [A4], misalignment [A5], pain [A6], and spontaneous thermal sensation or tastes [A7], and the degree of impairment in eating [B1], articulation [B2], work [B3], and social activities [B4] on a scale of 0–5. Items A1, A2, A3, A4, B3, and B4 demonstrated acceptable content validity. Inter-rater reliabilities were good or excellent for all items evaluated.<sup>40</sup>

### Management of psychosomatic disorders

Various treatment modalities tried out are:

Psychotherapy or the remedial influence of mind:

#### a. Cognitive-behavioral therapy

Cognitive behavioral therapies are most commonly used to manage the retaliation of an individual to stressful life events. Psychological appraisals of stressful events are basic principle of treatment and coping efforts related to these appraisals play a major role in determining the response to stress.<sup>41</sup>

#### b. Self observation

Self observation helps individual to become more aware of how they respond to problem situations. Patient has to keep record of how they responded to challenging or stressful events that occurred each day. Documentation should be made in three columns; antecedents, behaviors and consequences.

#### c. Relaxation training

Relaxation skills can be extremely useful in overseeing stress.

At the point when people figure out how to unwind, their general muscle pressure is decreased, just like their general level of autonomic arousal. People who can unwind are likewise more inclined to have the capacity to think more rationally and to be able to restructure negative cognitions when faced with stress.<sup>42,43</sup>

#### d. Hypnotherapy

Hypnosis, also referred to as hypnotherapy or hypnotic suggestion, is a trance-like state in which person have heightened focus, concentration and inner absorption. Patient under hypnosis, usually feel calm and relaxed, and can concentrate intensely on a specific thought, memory, feeling or sensation while blocking out distractions. Patients under hypnosis are more open than usual to suggestions, and this can be used to modify the perceptions, behavior, sensations and emotions.<sup>44</sup>

Hypnosis, also referred to as hypnotherapy or hypnotic suggestion, is a trance-like state in which person have heightened focus, concentration and inner absorption. Patient under hypnosis feel calm and relaxed, and can focus strongly on a particular idea, memory, feeling or sensation while blocking out distractions. Patients under hypnosis are more open than expected to recommendations, and this can be utilized to change the observations, conduct, sensations and feelings.<sup>44</sup>

#### e. Biofeedback

Biofeedback, referred to as applied psychophysiological feedback, is the way toward showing automatic or subthreshold physiological procedures, as a rule by electronic instrumentation, and figuring out how to deliberately impact those procedures by rolling out improvements in cognition. It gives a noticeable and experiential exhibition of the mind-body association. Biofeedback is likewise a therapeutic tool to encourage learning self direction of autonomic functions for enhancing wellbeing.<sup>45</sup>

## 2. PHARMACOTHERAPY

Pharmacological treatment of psychosomatic disorders include following:

#### 1. Antianxiety drugs

Benzodiazepines like Diazepam (5-10 mg/d), Alprazolam (0.25-0.5 mg/d)

#### 2. Antidepressants

Monoaminoxidase inhibitors: Phenelzine (15-90 mg/d), Isocarboxazid (10-40 mg/day)

#### 3. Tricyclic antidepressants

Amitriptyline (10-100 mg/d), Nortriptyline (25 mg/d)

#### 4. Sedatives/hypnotics

Barbiturate (15-20 mg).

Benzodiazepines like drugs.<sup>46</sup>

## CONCLUSION

In day today life psychological stress is major problem among human beings. The relationship between psychosomatic disorders and oral cavity has been established. During routine dental practice psychosomatic patients with oral disorders encountered frequently. Such disorders are misdiagnosed or many times resistant to the drug therapy. So accurate

diagnosis and management of these disorders require sufficient knowledge of stress and psychological disorders.

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