

Occupational hazards and its impact on quality of life of dentists

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Abstract: Dentistry is one of the most demanding professions that requires a high degree of skill and competence. Diminution of the fine motor and sensory reflexes of the operator results in low quality and productivity of work. Many occupational hazards still do persists in the modern dental era inspite of the numerous advances. Ignorance of these potential hazards alarmingly increases the chances of injury and subsequent consequences. This review is about the ergonomic and stress related impact on the dentist as an individual and how it affects his quality of life. The Dental Council of India should take interest in these concepts and take the initiative to include the subject as a part of dental curriculum particularly in bachelor level. This will not only help to build awareness among dental students but will also widen the scope of ergonomic and stress related research in the context of dental practices.

I. Introduction

An occupation is a person's usual or principle work or business especially as a means of earning a living. Every occupation has its own hazards and risks. Occupational hazard is a risk to a person in his working environment. Besides the consequences like fatal accidents, minor to severe injuries, allergic and systemic effects which occur immediately, there are those that appear at a later period. According to the WHO the term "hazard" refers to an inherent property of an agent, or a situation having the potential to cause adverse effects when an organism, system or population is exposed to that agent^[1]

II. A Review:

Dentistry is a demanding profession involving high degree of concentration and precision. Dentists require good visual acuity, hearing, depth perception, psychomotor skills, manual dexterity, and ability to maintain occupational postures over long periods^[2]. Diminution of any of these abilities affects the practitioner's performance and productivity. Despite numerous advances in dentistry many occupational health problems still persist in modern dentistry^[3]

Many dental health care professionals are at risk for occupational exposure to a variety of hazardous chemicals and situations. Being unaware of these potential hazards in the work environment makes them even more vulnerable to injury. The very ergonomics of the dental set up is by itself a potential threat. Microbiological contamination from splatter and aerosol dissemination generated by high speed instrumentation and percutaneous exposures and incidents remains a potential biological risk for the dental personnel.

Physical hazards to the dentist include blunt or broken instruments, vibration, fire, noise, blue light and heat. Uncooperative patients, over workload, constant drive for work perfection contribute to psychosocial stress. Exposure to various naturally occurring and synthetic chemicals are a potential hazard. It is of utmost importance that the dentist is aware of all the potential hazards in the work environment so that he can take the appropriate measures to protect himself, other dental staff and most importantly the patient.

A literature review was conducted which targeted all manuscripts published in peer reviewed journals relating to the topic of occupational health problems in dentistry. Only English language reports were included. Within the limitations of the search terms used, with the possibility of a bias done to limited literature review, it was found that only a few manuscripts favoured the physical and mental fatigue and its impact on the quality of life of dental surgeon. Hence, this review is done to fulfill the same.

Ergonomic hazard is a physical factor within the environment that harms the musculoskeletal system. This is characterized by presence of discomfort, disability or persistent pain in the joints, muscles, tendons and other soft parts. The risk factors comprise repeated movements and prolonged awkward or forced body posture^[4]. Dentists assume static posture at work which require more than 50% of the body's muscle to contract while resisting gravity. This tendency to adapt awkward physical positions is to get access to the oral cavity (Pollack.R 1996). All these result in MSD such as low back pain and carpal tunnel syndrome. MSD not only leads to physical fatigue, but also causes mental strain.

Number of prevalence studies around the world have shown more than 50% prevalence of MSD in dentists. For instance, a 12 month period prevalence of neck related pain among Queensland dentists(58%)^[5], this was similar to results from other studies such as in Denmark(65%)^[6], Saudi Arabia(65%)^[7].

MSD is one of the major occupational health problems in India and estimates have shown that MSD contributes to about 40% of all costs towards the treatment of work related injuries^[8]. About 41.69% of the Indian orthodontists are suffering from work related musculoskeletal disorders affecting one or more of the body parts^[9]. A New South Wales survey suggested modification of work practices including breaks, which did not seem to influence the reported symptoms associated with MSD and dentists seeking medical attention for MSD is increasing everyday^[10].

And, another interesting fact is that professional dissatisfaction was more commonly associated with low back pain^[11]. Ergonomics have one primary objective - the prevention of work-related musculoskeletal disorders, or the symptoms that aggravate these disorders. In dentistry, bad working habits, repetitive tasks - such as scaling, root planning, and uncomfortable physical postures contribute greatly to musculoskeletal disorders, stress, and loss of productivity. The key objective for clinicians is to find a position that allows them to achieve optimum access, visibility, comfort, and control at all times^[12].

The physical inactivity among dentists seems to put them at risk for the occurrence of MSD. The prevalence and severity of these disorders decrease by performing regular specific exercises. Physical therapy advice included posture correction, ergonomic advice and stretching exercises^[13]. Exercise burns up the excess adrenaline resulting from stress, allowing the body to return to a steady state. It can also increase energy and efficiency. Do find an exercise which you enjoy that will motivate you to continue doing it. Exercise also releases endorphins, which give us the 'feel good factor' and make us nicer to our patients and staff! Balance your diet. Eat a proper breakfast, drink sensibly and include lots of water to rehydrate the system. It is advisable to include complex carbohydrates (whole wheat bread, jacket potatoes) in the diet, to counteract mood swings, and fruit and vegetables to provide vitamin C to support the immune system.

Dr. Hans Selye in 1936 defined stress as the non-specific response of the body to any demand made upon it. Any agent or situation we deal with physiological or psychological, positive or negative has the potential to produce stress. When stress becomes excessive to the point of being very unpleasant or damaging it is referred to as distress. Burnout is defined as emotional exhaustion. Barassa M. and Baylard J.F (1994)^[14] have highlighted that interpersonal relationships involving patients and/or office personnel was probably one of the important areas of stress generation. Dentists belonging to older age group managed stress much better than their younger counterparts. Wilson R.F et al (1998) performed postal survey amongst 1007 general dental practitioners and found that improper time management was one of the most important stressors. Gorter R.C et al (1998) found that among 709 Dutch dentists a lack of career prospects appeared to be the stress factor most strongly related to burnout. In their example they found that male dentists in their forties were likely to suffer from stress related problems.

Occupational stress such as coping with difficult or uncooperative patients, over workload, constant drive for technical perfection, dissatisfaction in treatment is common among dentists. Kay and Lowe reported that the most common factors contributing to stress at work were patient demands (75%), practice management/staff issues (56%), fear of complaints/litigation (54%) and non-clinical paperwork (54%)^[15]. These physical and emotional demands result in physical and mental burnout. A comparison of stress levels and coping stress in male and female dentists showed that stress levels were similar, although women experienced more personal and domestic stress. Regarding coping response, both sexes exhibited similarity in most respects, except that women were more inclined to discuss their problems^[16].

Stress amongst dentists is thought to result from many sources, including job satisfaction, business income, working hours, as well as staff/patient interactions. Job dissatisfaction has been described in about one-third of British dentists^[17]. A study of Californian dentists suggested that, while dentists were satisfied, levels of satisfaction varied considerably^[18]. In a university of Iowa study, where more than half the dentists were apparently satisfied with their career, job satisfaction appeared to be best predicted by factors such as income, respect and patient relation. Dentists have been shown to be dissatisfied with aspects such as their levels of stress, threat of malpractice and a limited amount of personal time^[18-21].

Working hours also tend to be longer amongst dentists than the standard working week of around 35 hours^[20]. Regarding substance abuse, the most commonly reported cause of impairment amongst dentists is chemical dependence^[22]. Most dentists report use of alcohol and/or other drugs in moderation, although male dentists were more likely to consume alcohol in one previous study^[23]. Similar to their community counterparts, rates of alcohol consumption vary greatly between dentists of different countries^[17,24]. Although alcohol is the most widely abused drug and rates of alcoholism in the profession have been estimated at about eight percent^[2], increasing abuse of other drugs of dependence is becoming a growing concern in dental practice^[17]. Every 24 hours, every practicing dentist goes through a work stress phase and a rest relaxation phase. There must be a long range continuous equilibrium between the two, otherwise when a severe permanent disbalance occurs, the following may occur

- ❖ Early retirement from dentistry
- ❖ Depression

- ❖ Development of pathological processes of physical or mental origin
- ❖ Alcoholism and substance abuse
- ❖ Suicide

Dr. Albert Ellis theory known as Rational Emotive therapy (RET) states that it is not events in themselves including the action of others, that are upsetting to us but rather what we tell ourselves about such events. In other words our perception of events and the meaning we give determine how stressful they are for us. Intervention of stress is broken down into three steps: Primary, Secondary, Tertiary. Primary deals with eliminating the stressors all together. Secondary deals with detecting stress and figuring out ways to cope with it and improving stress management skills. Finally, tertiary deals with recovery and rehabbing the stress all together. These three steps are usually the most effective way to deal with stress not just in the workplace, but overall^[26]. Every fifth dental student suffered from slight to moderate depression. More than half of the dental and medical students did not have appropriate strategies of coping with stress^[27].

The progressive relaxation technique is based on the premise that the body responds to anxiety-provoking thoughts and events with muscle tension. The technique involves deep muscle relaxation, which reduces physiological tension, a state that is incompatible with anxiety. Thought-stopping can best be defined as a form of thought control. It involves concentrating briefly on the unwanted thoughts and then suddenly stopping and emptying your mind of these thoughts. It has been well-documented that negative and frightening thoughts invariably precede negative and frightening emotions. If the thoughts can be controlled, overall stress levels can be reduced significantly^[28].

In terms of individual stress, we should try to assess where the stress is coming from. Writing a list of causes from the most stressful down to the least stressful will help you gain some perspective of the problem and may inspire us to tackle some of the issues raised. It could also be useful to employ this technique with the chairside dental assistant and receptionist by asking them to identify the sources of stress. By airing and discussing grievances, concerns and new strategies, the various members will feel part of the dental team and provide mutual support in time of stress. It is advisable to have a competent receptionist who can schedule appointments in a spaced out manner such that the dentist will have sufficient breathing space between patients. In our every day life having a period of relaxation is vital. It could be as basic as taking breaks in the day or going out at lunchtime to listening to music or having a relaxing bath. The importance of relaxation is that it enables us to switch off and recharge our batteries!^[29]

Manage time efficiently. Again, taking a step back and reviewing the working schedule is essential. Developing leadership and organisational skills will enable you to feel more in control of the working environment. A culture of mutual support should be. Talking over your problems with someone you trust can be such a help!

III. Conclusion:

Several occupational hazards and risks remain a serious concern in dental practice. Musculoskeletal disorders are high among dentists. Pain in lower back, neck, shoulder, hand and wrist and associated musculoskeletal disorders and injuries are a major health problem for dental practitioners. There is a wide scope of reducing various problems arising out of dental practices. Principles of design ergonomics can be applied for redesigning of work station and work tools to promote more neutral working postures. Well organized job rotation and tasks planning can be introduced to reduce the cumulative musculoskeletal stress that may appear from prolonged work exposure. Furthermore, dentists could be trained for increasing the awareness of various ergonomic issues. These sorts of training can encourage them in adapting micro breaks during their jobs and to practice some regime of flexibility and strengthening exercises like arching the back, loose shoulder struggling and deep breathing which will help to compensate for the inevitable daily muscular and mental fatigue factors associated with the fixed, rigid body positions assumed during dental operations.

In spite of a multitude of overseas literatures available on MSD among dentists, studies among Indian dentist on similar issues are conspicuously low. This may be due to the fact that Ergonomics as a subject is still not that popular and has been not added in regular curriculum of different varsities. Therefore it seems natural that awareness about good ergonomic practices is lacking among general population and the dentists are also no exception^[24]. The Dental Council of India should take interest in ergonomic issues as these concepts are extremely important for dental offices. Initiative should also be taken to include the subject as a part of dental curriculum particularly in bachelor level. This will not only help to build ergonomic awareness among dental students but will also widen the scope of ergonomic research in the context of dental practices.

For many dentists the factors that aggravate problems of the work stress phase will have to be minimized or replaced by better operational practices, better interpersonal relationships, improved office décor. For others it will require greater emphasis on the factors that facilitate the recovery stage for instance, not taking office problems home, getting involved in interesting hobbies, participating in informal or formal daily physical

reconditioning programs and enjoying family and friends. Understanding the various risks will educate the professional for a better work practice and care of personal health.

We as individuals have more control over the amount of stress in our lives than we often are aware of or willing to admit. Although we are quick to look for external sources for stress in our lives, perhaps the best place to look is within ourselves. Concerning stress is that external situations or forces are not responsible for producing stress but rather it is our ability or inability to deal with such situations that determines if they are stressful for us.

Acknowledgement

I would like to express my special thanks of gratitude to my teacher Dr. Sakthi who gave me the golden opportunity to do this wonderful project on the topic ‘Occupational hazards and its impact on quality of life of dentists’ with which I came to know about so many new things. Secondly I would also like to thank my parents and friends who helped me a lot in putting this review together within the limited time frame.

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