Psychosocial Factors in Dentistry and their Impact on Health

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Abstract

Dentistry is a profession where the workers are susceptible to cumulative trauma disorders. Throughout their career, many dentists endure pain in the neck, shoulders, back, and hands; increasing their exposure to musculoskeletal disorders (MSDs). Though the symptoms of the MSDs are physical, the intrinsic and extrinsic psychosocial factors play an important role in the development of MSDs. Unlike some workers, who have the option to rotate to several jobs during the work day, dentists have minimal options for rotation of assignments. Stress factors sustained over time have an adverse effect on the health of the practitioners of this profession. In this research, data from 14 professional dentists with two to 43 years of experience are presented. Context specific psychosocial work factors, such as job demand, job future and career issues, and social interactions are discussed.

Keywords
Stress factors, dentists, musculoskeletal disorders, cumulative trauma disorders, health, ergonomic

1. Introduction

Research in the field of dentistry has revealed high incidences of musculoskeletal disorders (MSDs) among those in the dental profession [1-8]. These MSDs have been linked to a wide range of contributory factors related to the work environment, tasks performed and personal influences. Some of these influencers are shown in Figure 1. The continued exposure to risks has led researchers to call for appropriate occupational health and safety measures to be adopted and adhered to by dental staff [3]. In a study of 189 dentists who retired prematurely with non-life threatening diseases, one British study of ill health retired dentists, found that MSDs (55%) remained the primary cause of early retirement. The second highest cause of ill health retirement was mental and behavioral disorders (28%), followed by nervous/sense organs [9]. In a study of 1670 Lithuanian dentists, fatigue, headache, hand problems, chest pain and especially musculoskeletal complaints had a highly negative impact on general health. A total of 94.7% complained of being physically burned out (40.5% chronically), with 91% of the dentists reporting suffering from back pain (57.1% chronically) and 88.7% (23.4% chronically) reported suffering with headaches. In addition to these physical ailments, the majority of the responders to the questionnaire experienced some mental impairments in the previous year. Nervousness (89.2%) was the most prevalent impairment with 83.6% experiencing psychical burnout [10, 11].

In addition to MSDs, researchers have identified psychosocial factors that influence the health of these professionals. Physical and psychosocial work factors can be related to the same outcome, one of which is the work-related musculoskeletal disorders (WMSDs). Psychosocial work factors have been deemed crucial components of physical ergonomics. In order to fully prevent or reduce WMSDs, both physical and psychosocial work factors need to be considered [12]. This theory is backed by one of the earlier models of job strain which postulated that psychological strain did not result from a single aspect of the work environment, but from the joint effects of the demands of a work situation and the decision making freedom [13]. Eight categories of psychosocial work factors and specific facets in each category are shown in Table 1.
Figure 1. Factors potentially contributing to MSDs in dentistry (Adapted from [5]).

Table 1. Selected Psychosocial Work Factors and their Facets (Adapted from [12]).

<table>
<thead>
<tr>
<th>Category</th>
<th>Facets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Job demands</td>
<td>Quantitative workload, Variance in workload, Work pressure, Cognitive demands</td>
</tr>
<tr>
<td>2. Job content</td>
<td>Repetitiveness, Challenge, Utilization and development of skills</td>
</tr>
<tr>
<td>3. Job control</td>
<td>Task/instrumental control, Decision/organizational control, Control over physical environment, Resources control, Control over work pace: machine-pacing</td>
</tr>
<tr>
<td>4. Social interactions</td>
<td>Social support from supervisor and colleagues, Supervisor complaint, praise, monitoring, Dealing with (difficult) clients/customers</td>
</tr>
<tr>
<td>5. Role factors</td>
<td>Role Ambiguity, Role conflict</td>
</tr>
<tr>
<td>6. Job future and career issues</td>
<td>Job future ambiguity, Fear of job loss</td>
</tr>
<tr>
<td>7. Technology issues</td>
<td>Computer-related problems, Electronic performance monitoring</td>
</tr>
<tr>
<td>8. Organizational and management issues</td>
<td>Participation, Management style</td>
</tr>
</tbody>
</table>
In 2012, there were over 194,000 licensed practicing dentists in the United States, 56% of whom are female [14]. The aim of this research paper is to review the psychosocial work factors as they relate to dentistry using the data collected from 14 dental practitioners. While examples of each of the factors likely could be deliberated, in this paper only select factors are discussed. This paper is also precursor to additional planned research that looks at the link between the reported MSDs and psychosocial factors in dentistry for a larger sample of members in the profession.

2. Methodology

2.1 Participants
The data for this study was gathered from 14 dentists, five female and nine male. Twelve dentist professionals were recruited from practitioners in Greensboro, North Carolina, and surrounding cities. Two were recruited from Albany, Georgia. The participants had an average (standard deviation) height of 67.61 (4.53) in, weight 168.58 (22.55) lbs, and 19.43 (12.36) years of practice (with a range of 2 to 43 years). Weight was not collected for two participants. All were either in private practice; either single proprietor or partnership. Two were orthodontists, two were pediatric dentists and all others were general practitioners.

2.2 Data Collection and Processing
This data was collected as part of a more extensive research project to collect muscle activity using electromyography and upper body motion during specific dental procedures. Each dentist was given a combination of the surveys and questionnaires that enabled body discomfort and workplace analysis. A set of questionnaires were administered to each dentist in either their dental office or a laboratory setting. Questionnaires were either emailed or faxed upon request. Each dentist was given a discomfort survey that allowed them to identify local areas where they had experienced discomfort or pain. The Industrial Accident Prevention Association (IAPA) online passive surveillance tools were used to assess ergonomic pain, risks, or posture concerns. The body map was included as part of the discomfort survey used for this research. A supplemental survey was created to capture additional anthropometric data and work environment specifics, such as operating space, distance to instruments and layout of work space.

Correlation analysis was performed using the Pearson product-moment correlation coefficient (Pearson r) to test for correlation between years of practice and the number of pain areas, as well as gender and the number of pain areas. Data was analyzed using descriptive statistics and calculated in Microsoft Excel. Experimental procedures were approved by the university’s Institutional Review Board (IRB). Prior to the start of the experiment, all participants were informed of the requirements of the experiment and written consent was obtained.

3. Results
Six of the twelve participants reported being in good health (defined as minimal health issues, with some or no medication), while the other six reported being in excellent health (no health problems or medication). All indicated they exercised at least once a week, with eight indicating they exercised three or more times/week. Health and exercise activity data was not available for two of the 14 dentists. The orthodontists each indicated they saw 50 patients per day, while the other practitioners saw an average of 14 patients per day. The minimum and maximum number of patients seen per day was four and 28, respectively, excluding orthodontists. Six of the twelve pediatric and general dentists saw 15 or more patients per day.

With the exception of one participant, each person reported experiencing, at some time in the last twelve months, some musculoskeletal pain thought to be related to work. Without exception, all participants identified areas of discomfort in at least one body region (Table 2). The average number of identified areas of body pain was approximately four, with a maximum number of areas identified as nine.

Correlation analysis showed that neither years of practice nor gender was correlated with the number of areas of pain. Figure 2 shows the body areas and the number of dentists reporting pain in each of the areas. Neck (93%), lower back (71.4%) and shoulders (64.3%) were the most prevalent symptom areas. When asked to select how often they felt mentally exhausted after work, one practitioner stated never, 11 said occasionally, and 2 reported often. No one selected the fourth choice of always. When asked, how often are you physically exhausted after work, given the same four choices, one stated never, 11 occasionally, and two often (Figure 2). All reported zero time was lost from work, due to the reported pain. In addition, no one reported restricted duty because of pain.
Table 2. Years of Practice vs. Pain Areas

<table>
<thead>
<tr>
<th>Participant #</th>
<th>Yrs. in Practice</th>
<th>Areas of Pain</th>
<th>Mental Exhaustion After Work</th>
<th>Physical Exhaustion After Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
<td>3</td>
<td>Occasionally</td>
<td>Often</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>4</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>1</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>3</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>5</td>
<td>29</td>
<td>5</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>8</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>4</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>8</td>
<td>38</td>
<td>4</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>9</td>
<td>43</td>
<td>9</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>5</td>
<td>Often</td>
<td>Occasionally</td>
</tr>
<tr>
<td>11</td>
<td>16</td>
<td>2</td>
<td>Often</td>
<td>Occasionally</td>
</tr>
<tr>
<td>12</td>
<td>15</td>
<td>1</td>
<td>Never</td>
<td>Never</td>
</tr>
<tr>
<td>13</td>
<td>25</td>
<td>3</td>
<td>Occasionally</td>
<td>Occasionally</td>
</tr>
<tr>
<td>14</td>
<td>7</td>
<td>3</td>
<td>Occasionally</td>
<td>Often</td>
</tr>
</tbody>
</table>

Average 19.43 3.93
Std Dev. 12.36 2.30
Min 2 1
Max 43 9
Median 15.50 3.50

Figure 2. Incidents of musculoskeletal symptoms within the past 12 months
4. Discussion
The reported areas of pain for the 14 dentists were initially identified as physical factors and therefore classified as MSDs. The back, neck, and shoulder symptoms were in agreement with other research studies [1-4, 9, 11]. Further consideration of the identified symptoms and the practitioners’ occupation, also revealed the possibility of a psychosocial link. Based on the responses given by the study participants, at least three areas of psychosocial factors were readily identified [12]. These three areas, job demand, job future and career issues, and social interactions are discussed below.

4.1 Job demands
Two of the facets listed under job demand are work pressure and cognitive demands. Dentistry is recognized as a mentally demanding occupation, by the participants of this study and by other researchers [15]. As the dentists responded, excepting one, all reported feelings of mental exhaustion occasionally or often, after work. This mental exhaustion was in addition to the physical exhaustion. Despite the repeated incidences of pain in certain body regions, only 50% of the practitioners sought medical treatment for some of the pain areas. The medical treatment described was mostly chiropractic care and massage therapy. Other forms of treatment were over the counter pain relievers and for one person, a cortisone shot and acupuncture. The practitioners who sought medical care included the dentist who reported never experiencing mental or physical exhaustion.

For areas of pain not treated or for those with who reported not seeking medical treatment, it was stated that chiropractic care or massages were considered. Over the counter relief had also been administered at some point in time. (The taking of over the counter medication, shows a difference in how medical treatment is defined.) Other responses were a clear indication that pain is seen as an acceptable hazard. Acceptance of pain as part of the job was evident by the statements of those who had not sought medical treatment: 1) “pain is an occupational reality,” 2) “treatment is not necessary, as symptoms are not significant for long periods of time,” and 3) “pain did not bother me enough to seek help.” Three people gave the last reason as a response. The percentage of practitioners who sought medical treatment was consistent with the findings of Leggat [3]. For this study the number of dentist who reported to be in good to health was 100% (12 of 14 were asked about their state of health.). This report of good to excellent health was consistent with the findings of other researchers [15]. Though all could attribute the identified pains to their work environment, each consistently worked through the pain, as no days of work were loss nor did any work under a restricted schedule.

4.2 Job Future and Career Issues
Through conversations during the data collection period, additional psychosocial facets were also realized. The association of job future ambiguity and concern for job sustainment was apparent per comments by some practitioners. Three dentists stated that the demand of high overhead brought an increasing concern for operating a private practice and the continuation of long work hours. This stressor is exacerbated by supply costs, the need to update equipment or technology, and staff support. Financial success of the practice sustains not only the practitioner, but the staff and their families; thus the need for these professionals to work with pain. This too is consistent with other research [3, 15]. With the economic down turn and slow recovery of the economy, dentists have faced many challenges. This job strain can lead to stress and sleep disturbance [16]. Dentists of this study were no exception, and evidence suggest that the nature of the work of a dentist implies that problems related to the working environment and health are likely to be encountered [17].

4.3 Social Interactions
Social interaction such as social support and patient difficulty are facets of psychosocial factors in the work place. During the study dental professionals expressed concerns of social support. Support can be divided into informational, instrumental, emotional, and appraisal support. Only the emotional level is examined. Dentists not only described musculoskeletal pain but also stress. One participant, commented on spousal financial support during tough economic times. Persons who feel a lack of support from employers and co-workers often feel less value and may have lower levels of productivity than those who feel they have support [13]. Comments were also made of not having anyone to discuss treatment plans with, especially those who were in solo practices. Additionally, there is a confidentiality constraint that confines the dental professional from venting about stressful situations at work, leaving the dentist to cope with the emotions all alone. Dentistry can be a lonely profession even though the dentist is surrounded by people [18]. Dentist working in solo practice are more liable to report high levels of emotional exhaustion and low levels of personal accomplishment [19], consistent with the findings of this study. Poor social support has also been associated with incidence of reported back trouble [20].
Moreover, doctor-patient relationships can be challenging, at times. When treating the pediatric patient, there may be parental and behavioral patient challenges. Communication problems between dentists, patients or the caregiver, may lead to frustration on both sides. During recent years, a change has been described, from a mainly paternalistic role of the health professional to increasing emphasis on the right of patients to choose for themselves and to have a more active role in the relationship [21]. The shift in roles allows the patient or parent to make choices that may not have the best outcome for the patient. Many times the dental professional is left with the decision of whether or not to treat the patient. This creates a dilemma and a degree of discouragement.

5. Conclusion
Dentistry is known for its high cognitive demand and awkward postures endured, due to the intense focus required to deliver quality patient care. The preliminary findings of this research reveal that in addition to the attention paid to the MSDs suffered by practitioners of dentistry being primarily attributed to awkward postures, additional focus should be placed on psychosocial factors. There appears to be an inextricable link between psychosocial factors and MSDs; a cause and effect relationship that is greater than realized, previously. The small sample size of 14 dentists pointed to additional stressors that are present in workplace and are likely contributors to the high prevalence of MSDs. Further studies should examine these psychosocial factors and their facets. Findings with a larger sample size would further validate the findings of this small study.

References


