

**ORIGINAL ARTICLE**

# It is not just about occupation, but also about where you work

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**Abstract**

**Objectives:** Dentistry is characterized by a meaningful but also stressful psychosocial working environment. Job satisfaction varies among staff working under different organizational forms. The aim of this study was to identify (i) to what extent crucial psychosocial work environment characteristics differ among occupations in general public dental clinics in Sweden, and (ii) how much of the variation within each occupation is attributable to the organizational level.

**Methods:** All staff (N=1782) employed in four public dental organizations received an email with personal log-in to an electronic questionnaire based on the Copenhagen Psychosocial Questionnaire. After two reminders, a response rate of 75% was obtained. Responses from 880 nonmanagerial dentists, dental hygienists and dental nurses working in general practices were included in our analyses.

**Results:** First, we compared the three dental occupations. We found that job demands, task resources (eg influence, possibilities for development and role clarity), strain symptoms and attitudes to work differed among occupations, dentists having the least favourable situation. Next, we compared the four organizations for each occupational group, separately. For dentists, a significant and relevant amount of variance ( $P < .05$  and ICC  $> .05$ ) was explained by the organizational level for 15 of 26 subscales, least pronounced for task resources. By contrast, for dental nurses and hygienists, the corresponding number was 2 subscales of 26. The psychosocial working environment of people working at the organization with the highest levels of strain indicators and the least positive work-related attitudes differed systematically from the organization with the most favourable profile, in particular regarding job demands and leadership aspects.

**Conclusion:** In conclusion, the psychosocial working environment depended to a large degree on occupation and, for dentists in particular, also on their organizational affiliation. The findings suggest a potential for designing interventions at organizational level for improvements of the psychosocial working environment for dentists.

**KEYWORDS**

COPSOQ, dental services research, manpower, psychosocial working environment, public health

## 1 | INTRODUCTION

Stress- and strain-related health problems in dentistry have been reported for more than half a century.<sup>1-7</sup> The nature of dentistry is human service work, which is emotionally demanding, but also highly meaningful and intrinsically rewarding depending on the circumstances.<sup>2,8-11</sup> Personality traits and identification of specific stressors related to the work situation<sup>7,12-15</sup> constituted the initial scope for stress research within the context of dentistry and is still a current field.<sup>16,17</sup> Today, an increasing emphasis can also be seen on positive factors in the working environment and the role of the organization of work.<sup>18-23</sup> The Job Demands-Resources (JD-R) Model has proven to be useful for studying psychosocial working conditions and their effects.<sup>24-27</sup> The model integrates earlier occupational stress and motivational theories and includes negative (health deterioration) and positive (motivational) processes that the demands and resources in the work environment can generate.<sup>24</sup>

The public sector plays an important role in the overall organization of dental care in the Scandinavian countries. In Sweden, more than half of the active dentists and dental hygienists are employed in the public sector, where each region holds the main responsibility for securing the citizens' access to public dental health care.<sup>28</sup> Recruitment of staff to public dental clinics is difficult, and experienced staff are in particularly high demand.<sup>29</sup> Furthermore, a generation shift is foreseen because more than 35% of dental nurses have passed the age of 55.<sup>29</sup>

Previous research on governance has indicated that management is widely influenced by organization-specific principles.<sup>30</sup> This implies that differences in work environment and health among employees may be explained to some extent by differences in management principles between organizations. Accordingly, studying employees working in different organizations would make it possible to estimate the proportion of the psychosocial working environment that can be attributed to the overall organizational level. Such knowledge about the role of the overall organization of work is needed to ensure a healthy workforce.

The aim of this study was to investigate (i) to what extent different aspects of the psychosocial work environment differ among occupations in general public dental clinics in Sweden and (ii) the proportion of the variation within each occupation that is attributable to the organizational level.

## 2 | MATERIALS AND METHODS

The data used in this cross-sectional study were collected from May 2014 to January 2015 in four regional dental organizations in Sweden. All staff (clinical, technical, administrative and managerial/non-managerial) received an email with a personal login and password to an online questionnaire and, after two reminders, 1345 had responded, providing a response rate of 75% (ranging from 71% to 81% among the organizations corresponding to 150-262 respondents per organization). For this study, we have included only

nonmanagerial clinical staff (dental nurses, dental hygienists and dentists) from general practice. These comprise 880 employees (73% response rate for the subsample used for this study). The study was approved by the Regional Ethics Board in Southern Sweden (Dnr. 2013/256 & 2013/505).

The questionnaire was based on the Copenhagen Psychosocial Questionnaire (COPSOQ II).<sup>31,32</sup> The COPSOQ II is a generic, theory-based questionnaire which covers many aspects of the psychosocial working environment rather than being linked to one specific theoretical framework.<sup>31</sup> Today, the instrument has been translated into more than 25 languages and is widely used in research projects and for workplace assessments of the psychosocial work environment.<sup>33-35</sup> The subscales of the instrument can be divided, according to the theoretical reasoning behind the Job Demand-Resources Model,<sup>24,25,36</sup> into the following overall domains (Table 2): Job Demands, Task Resources, Interpersonal Relations, Leadership Resources, Work-related Attitudes, Strain Symptoms and General Health (Further details available in an online Appendix).

The Swedish version of the COPSOQ II questionnaire has been validated through a procedure including back translation and cognitive interviews.<sup>37,38</sup> Based on the findings from these procedures, we revised the Swedish version of COPSOQ and tested it in new rounds of interviews until it was found to be functioning well.<sup>37,38</sup>

In this study, we have included 26 subscales with a total of 84 items. In general, the COPSOQ items have five response options on Likert-type scales, which for statistical analyses are scored 100, 75, 50, 25, 0. Subscale scores are calculated as the mean item score. The subscale score was set to missing if respondents had answered less than half of the questions.<sup>31</sup>

Analyses used IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA). Distributional analyses of the study populations' background characteristics were conducted; Pearson chi-square tests and ANOVA tests were used for analysing differences in proportions and mean values, respectively, among occupations and organizations. Further, a nonresponse analysis was carried out using the same two tests. Next, for each of the three occupational groups, mean and standard deviation were calculated for all subscales. An ANCOVA test was applied to identify differences in subscale scores among occupational groups, controlling for the effect of age, weekly working hours and weekly hours with direct patient contact. For analyses not meeting the statistical assumption of equality of error variances, the nonparametric Kruskal-Wallis test was also used for an unadjusted comparison of occupational groups. The COPSOQ questionnaire is used in research as well as in workplace risk assessment and organizational development. Statistical tests of group differences are highly dependent on sample size. This implicates that even small differences can be statistically significant for large groups, while insignificant for smaller groups. Therefore, when interpreting results from workplace surveys, it is relevant to know not only if a difference is significant, but also if it is of practical relevance. The minimally important difference for COPSOQ subscales has been established as 5-10 points.<sup>35,39</sup> The subscale score differences between the organization with the least and the most

favourable profile, respectively, regarding work-related attitudes and strain were calculated. Finally, an ANOVA test was conducted for each occupational group to examine the differences among organizations for the subscales. The intraclass correlation (ICC) was calculated to assess the amount of variance in individual-level responses for each COPSOQ II subscale that can be explained by variability among the four organizations:

$$ICC = (ms_b - ms_w) / (ms_b + ((n_g - 1)ms_w))$$

where  $ms_b$  is the between-group mean square,  $ms_w$  is the within-group mean square, and  $n_g$  is the group size, according to Bliese.<sup>40</sup> The larger the ICC value, the higher the proportion of the total variance in a subscale is explained by organizational membership. When evaluating the ICC, values exceeding .05 are considered being relevant for aggregation of individual-level data to a higher organizational level, and .20 is considered to be a high level.<sup>40</sup>

### 3 | RESULTS

The characteristics of the study sample are summarized in Table 1. Almost all respondents were women holding a permanent position. Dentists were more often born outside Sweden, men or without children in the home than the other two occupational groups. Also, dentists were on average the youngest group and had the highest number of weekly work hours with direct patient contact. Among organizations (data not shown in Table) differences were seen with occupation (dental nurses: 46.6%-62.0%), being born in Sweden (76.2%-88.1%), age (44.1-48.6 years) and hours with patient contact (29.9-31.9 hours).

On average, nonrespondents were 2.5 years younger than those responding to the survey ( $P=.003$ ). The response rate was significantly lower for men than for women (65% vs 74%,  $P=.048$ ), and dentists were less likely to answer than other occupations (response rates: dentists 64%, dental hygienists 74% and dental nurses 78%,  $P<.001$ ).

Summary data on COPSOQ subscales are presented by occupation in Table 2. The overall pattern for differences between occupational groups shows that the domains covering demands and task resources varied depending on occupation, while this was not the case for interpersonal relations and leadership resources (except the subscale for vertical trust). Neither differed general health, while all outcome subscales comprising the domains work-related attitudes and strain indicators differed among occupations. The average scores for work pace, stress symptoms and sleeping troubles were (14, 10 and 11 points) higher for the total sample compared to reference values for these subscales,<sup>31</sup> and this applied in particular to dentists.

Table 3 provides an overview of the difference in mean subscale scores for those two organizations having the most and the least favourable profile, respectively, regarding work-related attitudes and strain symptoms. A clear pattern was seen, as the organization with the best profile differed systematically positively on all psychosocial work environment factors with no exception. The largest differences were seen for demands (Work-Family Conflict, Quantitative Demands and Role Conflicts), and in relation to leadership (Predictability, Quality Leadership and Organizational Justice). Next, for each occupational group, we separately compared the four organizations. The ICCs for each subscale can be interpreted as the proportion of the variance explained by organization for each occupational group separately. For dentists, a significant and relevant amount of variance ( $P<.05$  and  $ICC \geq .05$ ) was explained by which organization they worked in for 15 of 26 subscales. By contrast, for dental nurses and hygienists, the corresponding number was 2 subscales of 26. Among dentists, the differences by organization were most pronounced for the domains for demands and strain symptoms, and least pronounced for task resources, with the exception of the subscale for influence.

### 4 | DISCUSSION

Comparing dental nurses, hygienists and dentists revealed that job demands, task resources (eg influence, possibilities for development

**TABLE 1** Population characteristics, overall and by occupation

	Total sample (N=880) Percentage	Dental nurses (N=466) Percentage	Dental hygienists (N=201) Percentage	Dentists (N=213) Percentage	P value for difference between occupational groups
Gender: Female	92.0	99.4	96.5	71.8	<.001
Born in Sweden	83.1	90.5	84.5	65.7	<.001
Children in the home	44.1	43.9	52.3	36.8	.007
Permanent position	97.7	98.3	98.5	95.8	.089
	Total sample (N=880) Mean (SD)	Dental nurses (N=466) Mean (SD)	Dental hygienists (N=201) Mean (SD)	Dentists (N=213) Mean (SD)	P value for difference between occupational groups
Age (y)	46.8 (11.9)	50.3 (10.4)	44.5 (11.4)	41.3 (12.8)	<.001
Weekly work hours (total)	36.4 (6.1)	36.4 (6.1)	36.3 (5.5)	36.4 (6.5)	.976
Weekly work hours with patient contact	31.2 (8.9)	30.4 (10.1)	31.8 (7.5)	32.4 (6.9)	.020

**TABLE 2** Unadjusted mean (SD) subscale scores by occupation for the total study sample

	Mean (SD) Study sample (N=880)	Reference value	Mean (SD) Dental nurses (N=466)	Mean (SD) Dental hygienists (N=201)	Mean (SD) Dentists (N=213)	P value for difference between occupational groups
<b>Demands</b>						
Quantitative demands	45.3 (17.2)	40.2	42.5 (15.8)	44.4 (15.7)	52.1 (19.8)	<.001*
Work pace	73.2 (18.1)	59.5	70.8 (18.2)	76.6 (17.3)	75.2 (17.9)	.003
Emotional demands	54.2 (18.0)	40.7	50.6 (17.8)	53.9 (16.2)	62.2 (17.3)	<.001
Role conflicts	34.7 (17.0)	42.2	32.3 (17.0)	34.2 (15.3)	40.5 (17.2)	<.001
Work-family conflict	32.2 (26.6)	33.5	27.9 (25.5)	28.7 (22.4)	44.8 (28.8)	<.001*
<b>Task resources</b>						
Influence	43.9 (17.4)	49.8	40.1 (16.6)	48.1 (16.3)	48.3 (18.1)	<.001
Possibilities for Development	70.7 (15.3)	65.9	67.7 (15.5)	73.6 (12.5)	74.5 (16.0)	<.001
Variation	68.3 (20.5)	60.4	70.0 (19.9)	63.4 (19.2)	69.3 (22.3)	<.001*
Role clarity	80.3 (14.3)	73.5	80.8 (13.7)	83.1 (12.8)	76.3 (16.3)	<.001
Meaning in work	79.3 (15.9)	73.8	78.7 (16.1)	81.6 (13.9)	78.5 (17.0)	.081
<b>Leadership resources</b>						
Predictability	63.9 (19.7)	57.7	63.8 (19.1)	66.2 (18.5)	61.7 (21.9)	.089
Quality leadership	61.5 (22.2)	55.3	62.2 (20.8)	60.1 (21.8)	61.1 (25.4)	.626*
Social support superior	67.0 (19.8)	61.6	66.8 (19.7)	68.4 (18.8)	66.1 (21.1)	.263
Recognition	66.0 (21.0)	66.2	66.0 (20.5)	67.4 (19.7)	64.9 (23.1)	.386
Vertical trust	70.7 (17.3)	67.0	72.8 (15.9)	71.0 (16.7)	65.7 (20.0)	<.001*
Organizational justice	60.3 (18.3)	59.2	61.3 (17.9)	60.0 (16.7)	58.3 (20.4)	.173*
<b>Interpersonal relations</b>						
Social support colleagues	68.1 (15.6)	57.3	68.8 (15.8)	67.2 (14.8)	67.7 (15.8)	.486
Social community at work	79.4 (14.5)	78.7	80.3 (14.1)	78.5 (14.0)	78.4 (15.8)	.558
Horizontal trust	72.2 (18.2)	68.6	73.2 (18.1)	71.1 (17.7)	71.2 (19.0)	.736
<b>Work-related attitudes</b>						
Job satisfaction	66.4 (17.9)	65.3	68.2 (17.5)	68.0 (14.8)	61.1 (20.4)	<.001*
Commitment work	69.3 (19.9)	60.9	71.0 (18.8)	70.4 (18.9)	64.6 (22.5)	.005*
<b>Strain symptoms</b>						
Stress	36.7 (24.5)	26.7	33.1 (24.5)	37.9 (23.3)	43.7 (24.2)	.004
Burnout	40.6 (24.3)	34.1	37.0 (24.1)	39.7 (22.9)	49.2 (24.0)	<.001
Sleeping troubles	31.9 (25.4)	21.3	30.9 (25.4)	30.4 (24.5)	35.4 (26.0)	.047
<b>Health</b>						
General health	60.0 (21.0)	66.0	59.4 (21.1)	59.3 (19.4)	62.4 (22.3)	.457

Nonadjusted mean score and standard deviation by occupation and P-value for significance of differences between occupational groups. The P-value is based on ANCOVA analyses and controlled for the effect of age, weekly number of total work hours and hours with direct patient contact.

\*P value based on Kruskal-Wallis test. Reference values are based on a representative sample of working Danes between 20 and 59 years of age.<sup>31</sup>

and role clarity), strain symptoms and attitudes to work differed among occupations, dentists having the least favourable situation. Next, we compared the four organizations for each occupational group, separately. Here we found that the working conditions as well as strain and attitudes to work varied for dentists in particular. Finally, the psychosocial working environment of people working at the organization with the highest levels of strain indicators and the least positive work-related attitudes differed systematically from the organization with the most favourable profile, in particular regarding job demands and leadership aspects.

A strength is that our study is based on a relatively large survey, conducted in entire PHDS organizations in several regions, and with a high response rate. Besides, using a comprehensively validated, internationally recognized questionnaire, we had the opportunity also to compare with external population-based reference values. On the other hand, four organizations are a relatively low number and they were not randomly selected but included because they had an interest in collaborating around a workplace survey as part of a research project. This may imply an under-estimation of the amount of variation attributed to the organizational level, as the participating

**TABLE 3** Difference in mean subscale score between the best and the worst organization and variation between organizations in COPSOQ subscale means by occupations (intraclass correlations [ICC])

	Difference in mean subscale score between the best and the worst organization	Dental nurses		Dental hygienists		Dentists	
		ICC	P	ICC	P	ICC	P
<b>Demands</b>							
Quantitative demands	-8	.05	<.001	.04	.024	.10	<.001
Work pace	-6	.00	.224	-.02	.890	.10	<.001
Emotional demands	-5	.00	.250	.02	.117	.06	.006
Role conflicts	-8	.01	.047	.02	.098	.08	.001
Work-family conflict	-16	.03	.004	.02	.138	.07	.002
<b>Task resources</b>							
Influence	6	.00	.080	.09	.001	.12	<.001
Possibilities for development	2	.00	.438	-.01	.647	.01	.263
Variation	1	.00	.536	.02	.114	-.01	.608
Role clarity	4	.00	.467	.02	.091	.04	.025
Meaning in work	4	.00	.360	.00	.370	.00	.306
<b>Leadership resources</b>							
Predictability	10	.03	.003	.01	.213	.07	.002
Quality leadership	10	.01	.090	.03	.068	.07	.003
Social support superior	4	.01	.187	-.01	.698	.03	.037
Recognition	7	.02	.025	.01	.243	.03	.039
Vertical trust	7	.01	.051	.04	.037	.06	.004
Organizational justice	9	.02	.027	.00	.319	.05	.008
<b>Interpersonal relations</b>							
Social support colleagues	3	-.01	.908	.01	.167	.09	<.001
Social community at work	6	.00	.202	.03	.053	.03	.037
Horizontal trust	7	.01	.160	.04	.026	.02	.106
<b>Work-related attitudes</b>							
Job satisfaction	8	.00	.263	.00	.337	.09	.001
Commitment work	12	.03	.005	.05	.015	.05	.013
<b>Strain symptoms</b>							
Stress	-13	.04	.001	-.02	.931	.07	.003
Burnout	-13	.05	<.001	-.02	.917	.05	.011
Sleeping troubles	-12	.04	<.001	-.01	.570	.03	.042
<b>Health</b>							
General health	7	.02	.018	.03	.047	.01	.216

organizations can be expected to belong to those that function best. The Swedish model for public dental services is rather unique, making international generalizations uncertain. Therefore, replication studies in more organizations and other settings are needed. Also, it would be beneficial to follow organizations as well as local workplaces longitudinally to study whether changes at the overall organizational level are followed by changes in the working environment locally. In particular, intervention studies based on our findings might yield deeper knowledge concerning the importance of occupations and organizations for different aspects of the work environment.

Differences in work-related attitudes and in strain symptoms were found for different occupational groups. The dental

occupations work closely together at the workplace, but have different areas of responsibility and tasks. In the light of this, it is understandable that mainly those aspects of the working environment addressing demands and task resources varied among occupational groups. Other parts of the psychosocial work environment are more dependent on the social interaction and interpersonal relationships at work,<sup>41</sup> making it logical that interpersonal relations and leadership resources among dentists were more related to the organizational level than task resources were. Our findings are in line with what could be expected and also in line with the overall reasoning behind the design of the COPSOQ instrument as covering aspects related to work tasks and to the workplace.<sup>31,32,35</sup> COPSOQ II

subscales have in a number of studies shown good ability to distinguish work environmental factors for different occupational groups.<sup>32,42,43</sup> The findings of our study add to this knowledge by also showing good discriminatory validity for demands and task resources for occupations working closely together in teams, which is often the case in many settings within, for example, health care. Background data showed that dentists work more time in direct contact with patients than the other occupational groups and, as they are also youngest, they have less work experience. Also, the work performed by dentists is characterized by high complexity.<sup>44</sup> This may lead to an intensification of their work situation compared to the auxiliary staff and might thus contribute to the explanation of high levels of work pace, stress symptoms and sleeping troubles among dentists in particular. An international trend is that auxiliary staff groups after formal training are taking over work tasks which previously were done by dentists, a development which is not necessarily perceived as desirable among dentists.<sup>44</sup> The overall findings of high demands for dentists in particular suggest that redistribution of work tasks has not relieved the dentists of high work pressure. As the work pace is very high for all staff groups, it seems important to consider whether further redistribution of work tasks is the way forward to increase efficiency. A special challenge for the organizations will be the need for integrating young dental nurses in an environment characterized by high strain when a large group of experienced dental nurses are retiring in coming years. Also, a larger proportion of dentists than dental nurses and hygienists were born outside Sweden. A relevant topic to address in future research will be how employees with different backgrounds are integrated in the dental team.

All employees refer to the same management, and thus, it was somewhat surprising that dentists reported lower average levels of trust between management and employees than dental nurses and hygienists did. An explanation could be that the latter interpret the term "management" differently from the dentists. However, in cognitive validation interviews of these items, this was not identified as a problem.<sup>45</sup> Also, the subscales for horizontal trust and organizational justice are constructed in a similar way and should therefore have shown a corresponding difference if this explanation had been valid. Another explanation might be that dentists constitute a typical mature profession with stronger norms and higher expectations of professional freedom than dental nurses and hygienists.<sup>46</sup> This could imply different expectations of the relationship between employees and management.

The four dental organizations face similar external contexts, in that they are regulated by the same legislation. Previously, differences in job satisfaction have been reported for dentists working in different organizational forms.<sup>21,22,47-49</sup> The findings of our study indicate that not only job satisfaction, but a broad range of work environment factors, strain symptoms and also work-related attitudes can show high variability for employees having the same job, but working in different organizations. Our findings thereby corroborate previous research concluding that a considerable part of the variation of job strain can be drawn from factors at the organizational level impacting job demands

and control.<sup>50</sup> It is worth remarking that the findings indicated that working conditions vary more for dentists across organizations than is the case for dental nurses and hygienists (more subscales showing significant ICC values and higher ICC values for dentists). This is an interesting finding because classical professionals, such as dentists, are often regarded in the literature as challenging to manage.<sup>51</sup> The variability in work environment for dentists in particular indicates that it is possible to influence the experienced work environment by organizing and managing similar work in different ways. Furthermore, it suggests a potential for future learning from the best examples across regions to identify possibilities of improving the work environment by policy level interventions.

Attention has been paid to management principles for the public dental sector in Sweden since the 1990s, and especially, a strong emphasis on productivity has been described as problematic in relation to the psychosocial working environment.<sup>52-55</sup> The organization with the best and the worst profile for strain symptoms and work-related attitudes differed systematically in all psychosocial work environment factors, but not in the distribution of occupations or other demographic background characteristics. It is remarkable that the subscales for work-family conflict, role conflicts, quantitative demands, predictability, leadership quality and organizational justice differed by 8-16 points between the best and the worst organization. The findings of the present study thus indicate a potential for achieving a more sustainable psychosocial working environment by investments in promoting a leadership and organization of work addressing these issues.

Our findings indicate that the psychosocial work environment in dentistry is influenced by both an individual's occupation and organizational factors at policy level. The findings suggest a potential for improving the work environment at organizational level, in particular for dentists. Finally, the findings corroborate the discriminatory validity of COPSOQ II subscales even between occupational groups working closely together in teams. This adds to the usability of COPSOQ II for identifying risk factors as well as health-promoting resources related to occupation.

In conclusion, the psychosocial working environment depended on occupation and for dentists in particular, also on their organizational affiliation. Thus, it is not just about occupation but also about where you work.

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## SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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