

# Quality management and job related factors predicting satisfaction of dental clinic staff in Estonia

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## SUMMARY

**Objective.** The aim of the study was to explore the role of managerial style, work environment factors and burnout in determining job satisfaction during the implementation of quality improvement activities in a dental clinic.

**Method.** Quantitative research was carried out using a prestructured anonymous questionnaire to survey 302 respondents in Kaarli Dental Clinic, Estonia. Dental clinic staff assessed job satisfaction, managerial style, work stress and burnout levels through the implementation period of ISO 9000 quality management system in 2003 and annually during 2006–2009. Binary logistic regression was used to explain the impact of satisfaction with management and work organisation, knowledge about managerial activities, work environment and psychosocial stress and burnout on job satisfaction.

**Results.** The response rate limits were between 60% and 89.6%. Job satisfaction increased significantly from 2003 to 2006 and the percentage of very satisfied staff increased from 17 to 38 ( $p < 0.01$ ) over this period. In 2007, the proportion of very satisfied people dropped to 21% before increasing again in 2008–2009 (from 24% to 35%). Binary logistic regression analysis resulted in a model that included five groups of factors: managerial support, information about results achieved and progress to goals, work organisation and working environment, as well as factors related to career, security and planning. The average scores of emotional exhaustion showed significant decrease, correlating negatively with job satisfaction ( $p < 0.05$ ).

**Conclusion.** The implementation of quality improvement activities in the Kaarli Dental Clinic has improved the work environment by decreasing burnout symptoms and increased job satisfaction in staff.

**Key words:** quality management, work environment, dentistry, job satisfaction, work stress, burnout.

Human resource development, staff participation and job satisfaction are integral elements for models of quality management (QM) and external peer reviews of health care services (1, 2). Several studies have demonstrated that implementing various QM models, quality programmes and projects in health care organisations results in increased job satisfaction in staff (3-6). Work environment factors, work stress and burnout issues are very important part of QM development process (7-9).

In general, job satisfaction depends on several factors and most often by organisational, psychosocial and environmental factors at work. A number of studies have demonstrated that job satisfaction is predicted by management style, positive evaluation of local leadership, trust and the availability of information from management, as well as social security, support and feedback from one's immediate superior (10-13). In addition, working environment, income, psychosocial factors and staff burnout have also been found to predict the level of job satisfaction (13-15). Work stress and burnout are common linked problems in areas of health care in which high levels of stress cause emotional exhaustion but suppress the signs of cynicism among doctors (16).

Estonian healthcare, like wider Estonian society, has undergone rapid changes and implemented a number of reforms since the early 1990s. Reforms in the healthcare system started with the radical

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change of financing principles in 1992, in which the previous highly-centralised tax-based financing system was replaced with health insurance and followed by number of organisational changes (17). Ongoing financial and structural reforms in the healthcare system have also inspired health care managers to introduce new management principles, including QM principles. In the mid-1990s, in addition to professional clinical quality issues, health service providers started paying greater attention to the wellbeing and satisfaction of both patients and staff (18). For example, the first staff satisfaction study in a health care organisation was conducted in 1999 and follow-up studies continued during the first decade of this century (12). Nonetheless, the general approach in QM remains mainly concentrated on regulations, such as licensing providers and health workforce, and regulations to protect patients' rights. Although some hospitals have introduced the European Foundation for Quality Management's excellence model, the implementation of voluntary mechanisms for quality assurance in general is still in the developmental stage (18).

Kaarli Dental Clinic, established in April 1997, is the largest private dental clinic in Estonia. The clinic started with one employee and two doctors before increasing steadily to 110 employees, including 39 full-time dentists. The clinic has a universal profile and delivers a full range of dental care services, including endodontia, dental surgery and implantology, orthodontia and prosthetics. The clinic also has its own dental technical laboratory.

By the end of 2003, when the clinic grew to 50 employees, management proposed implementing the ISO 9000 QM system. The main reason for this was the fact that clinic had become the largest private dental clinic in the region but lacked experience in keeping management activities and dental services at a high level. There were also some precedents of ISO QM standards being implemented in dental clinics (19, 20).

In general, most health services in Estonia are financed by national health insurance (primary care, specialized out- and in-patient care) or state budgets (ambulance care and emergency services for uninsured people). However, dental care remains financed by national health insurance, although only for children up to 19 years of age, and there is limited dental service compensation for pensioners. Adults must pay for their dental care themselves. Accordingly, the most considerable changes have come about in the area of dentistry, where the majority of providers are now private companies whose patients are mostly responsible for out-of-pocket payments

for their dental care (17). This means that there is competition between dental health service providers and one way for such a provider to be more competitive is to become more client-oriented by implementing QM systems.

Within two years of deciding to implement ISO standards, the clinic had achieved notable changes in its management style. Business processes were mapped and the corresponding instructions and rules were described. A system was also implemented to have periodic patient and staff satisfaction surveys. After implementing management changes, the first ISO certificate was issued in early 2006 by the German certified institutions (Alphacert) and audit was also conducted by a German company. In addition to other indicators, patient and staff job satisfaction rates were evaluated in December 2003 before the implementation of the QM system, as well as after the certificate was issued. Since that time, satisfaction surveys have been conducted annually.

This paper has two objectives. The first is to examine job satisfaction trends and its components before and after the implementation of the ISO 9000 QM system in a dental clinic. The second aim is to explore the role of factors related to the management issues in determining job satisfaction.

Resulting from the objectives the following research questions were formulated:

What kind of effect had the implementation of ISO 9000 QM system on the staff's job satisfaction?

What is the role of managerial and work environmental factors in staff's job satisfaction?

## MATERIAL AND METHODS

In December of 2003 and annually from 2006 to 2009, researchers from Tartu University conducted staff job satisfaction studies that were initiated by clinic management. All these studies were comprehensive including all employees of the clinic – dentists, nurses and administrative staff. The questionnaires were distributed to staff members by the responsible person from the clinic and returned in closed envelopes directly to the researchers. The envelopes and the questionnaire forms contained no names or codes for individuals. Respondents were assured that their questionnaires would be used only for research purposes, that individual answers or identities would not be disclosed and that management had no access to the initial data (returned questionnaires and data sheets).

The questionnaire used in the first study in 2003 was based on those used in 1999 (12), but it was shortened and adapted to the specific characteristics

of a dental clinic. The questionnaire focused on areas of general and managerial satisfaction, information about managerial activities, relationships with management, and managerial feedback as well as satisfaction with work environment, work stress and staff's burn-out. Additionally, some background data was sought (respondent's age, position, workload and duration of employment at the clinic).

Job satisfaction and managerial satisfaction were measured using a five-point Likert scale (1=very dissatisfied to 5=very satisfied). The staff members' knowledge of managerial activities were evaluated by asking how well they had been informed about (1) the strategic plans, goals and objectives of the clinic, (2) the results achieved and progress toward goals, (3) the clinic's economic situation and budget and (4) principles of the salary and bonus payment. The answers ranged from 1 (not at all) to 5 (very well). The items describing the knowledge of managerial activities were summed with a Cronbach's alpha of 0.82.

The Maslach Burnout Inventory (MBI) (21) was used in the study, in which items formed three sub-scales: emotional exhaustion (EE), depersonalisation (DP) and professional accomplishment (PA). The frequency scale (0–6) was used, where 0=never and 6=every day. The alpha reliabilities of burnout sub-scales were 0.83 for EE, 0.83 for DP and 0.76 for PA, whereas the alpha reliability of the entire MBI was 0.81.

The questions of work stress (organisational and psychosocial factors) (*OSI, Occupational Stress Indicator*) were adapted for general practice dentists (8). The respondents answered the questions "How frequently does the problem arise?" on a five-point scale (0=never and 4=almost always).

All of the questions were identical for the subsequent study years. Since 2006, however, more attention has been paid on managerial satisfaction, work organization, work environment and psychosocial stress factors. These factors in further analysis were described only in the years 2006-2009.

The factors describing satisfaction with the work environment (groups 1–3), managerial support (group 4) and problems causing work stress (groups 5–9) were summed with a Cronbach's reliability score of  $\alpha=0.82$ .

The factor groups were defined as follows:

1. Work organization (six items,  $\alpha=0.83$ );
2. Working environment and hygiene (five items,  $\alpha=0.72$ );
3. Work safety (three items,  $\alpha=0.78$ );
4. Managerial support and feedback (eight items,  $\alpha=0.93$ );

5. Clarity of work, pressure and resources (four items,  $\alpha=0.75$ );
6. Recognition, relations with supervisors and subordinates, variety, responsibility, mistakes (seven items,  $\alpha=0.70$ );
7. Feedback and collaboration (three items,  $\alpha=0.69$ );
8. Career, security and planning (three items,  $\alpha=0.61$ );
9. Knowledge, training, experience and work results (five items,  $\alpha=0.58$ ).

A chi-square test was used to compare the structure of the sample in reference to the background characteristics and job satisfaction between the study years. For further analysis, the mean job satisfaction values were calculated for the abovementioned groups. An ANOVA test was used to compare the means. The items describing the problems causing work stress ( $n=25$ ) were grouped using factor analysis. The relationships between job satisfaction and other factors were described by Spearman correlation coefficients. In order to explain the impact of managerial satisfaction, knowledge about managerial activities, work environment, work stress factors and burnout levels on job satisfaction, binary logistic regression was used where job satisfaction was defined as a dependent variable with two values (1=very satisfied, 0=less satisfied). The independent variables were grouped as follows: managerial satisfaction and knowledge about managerial activities (1=very satisfied/well informed, 0=less satisfied/less informed). The factors describing the work environment, managerial support and work stress were grouped by their mean values: 1=mean value  $\geq 4.50$ -5.00, 0=mean value  $< 4.50$ . The dimensions of staff's burnout were included in the analysis as continuous variables. For the correlation and regression analyses, the results from 2006 to 2009 were summarized. The level of statistical significance was set at  $p < 0.05$  throughout. All statistically insignificant variables were excluded from the final model. The data was analysed using SPSS 20.0 statistical software for Windows.

## RESULTS

In the study period (2005–2009) the number of staff increased from 57 to 107. The response rates were as follows: 2003 – 63.2 percent (36/57), 2006 – 60 percent (46/77), 2007 – 70.5 percent (62/88), 2008 – 89.6 percent (86/96), 2009 – 67.2 percent (72/107). Out of the entire sample, 33% were dentists, 30% nurses and 27% administrative staff. The average age of all study participants was  $39.4 \pm 11.2$  years (19–71), the average length of service in the

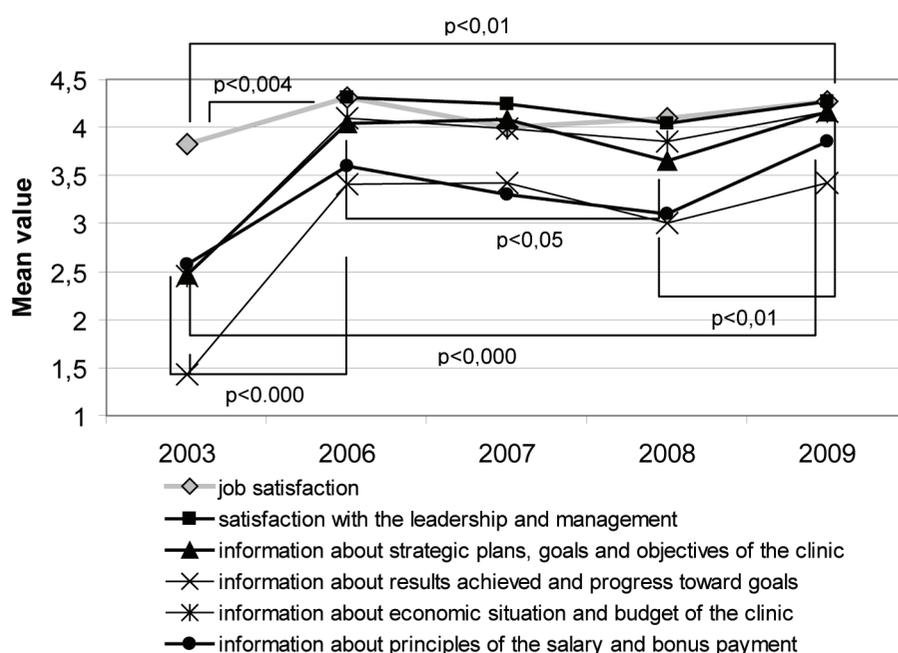


Fig. 1. Dynamics of job satisfaction, leadership and availability of information in organisation in 2003 and 2006–2009

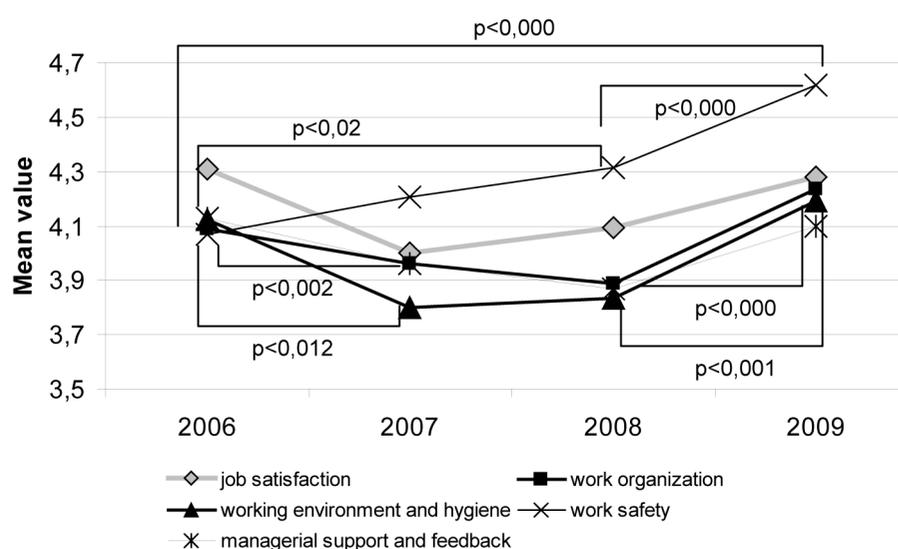


Fig. 2. Dynamics of job satisfaction, working environment, organisation and managerial support in 2006–2009 (a significant changes of job satisfaction dynamics are the same as it shown on the Figure 1).

present occupation was  $4.9 \pm 4.5$  years (0-50) and the average work load was  $33.3 \pm 10.5$  hours per week (6-60) (Table 1). There was no statistically significant difference in the structure of study groups with reference to position, age structure, service length or work load in different study years. None of these variables correlated with job satisfaction or work environment factors.

Figures 1 to 3 present the trends of job satisfaction together with the level of staff knowledge, management, organisational, psychosocial and work environment factors. In the figure 1 the average means of job satisfaction showed sharp increase in 2003-2006 ( $p < 0.004$ ) and after two-year set-back it

increased again in 2008-2009 ( $p < 0.01$ ). Also, there was a significant increase in the number of very satisfied people in 2006 compared to 2003, with the percentage of very satisfied people increasing from 17% to 38% ( $p < 0.01$ ). In 2007, the proportion of very satisfied people dropped to 21% and started to increase again in 2008–2009 (from 24% to 35%). The same trend became evident when analysing the staff’s knowledge about the clinic’s managerial activities and working environment factors. Figure 1 show a significant increase in the average means of availability of information about strategic planning, clinic’s budget, salary and bonus payment in whole study period ( $p < 0.000$ ), whilst a little fall of these indices registered in 2006–2008 ( $p < 0.05$ ), but new increase of these parameters was measured again in 2008–2009 ( $p < 0.05 \dots 0.01$ ).

Figure 2 show the dynamics of job satisfaction, factors describing work environment and hygiene, work organisation and managerial support. We saw a steady improvement of work safety in whole study period ( $p < 0.000$ ). Ibid a significant fall in the average means of working environment and hygiene was registered in 2006–2008 ( $p < 0.012 \dots 0.022$ ). In this period likewise to fall of job satisfaction, work organisation and managerial support tended to worsen as well, but these parameters showed significant increase again in 2008-2009 ( $p < 0.001$ ).

Figure 3 shows that the average scores of work clarity, pressure, resources and knowledge and control over work results promptly improved in 2006-2007 ( $p < 0.014 \dots 0.015$ ), while in general the role clarity showed significant increase in 2006-2009 ( $p < 0.007$ ). In 2008-2009 a dynamics of average scores of recognition and interpersonal relations, collaboration, feedback, security and career planning showed only tendencies to increase.

Figure 4 shows the dynamics of average means of burnout indicators (EE, DP, PA) and satisfaction. The average scores of EE in 2009 showed a significant decrease compared to 2003 ( $p < 0.05$ ). PA tended to fall during the study years, while the dynamics of average sum-scores of DP in 2006-2009 showed similar dynamics with satisfaction, as described above.

Job satisfaction correlated positively with managerial satisfaction (Spearman's rho  $\rho = 0.42$ ,  $p < 0.0001$ ) as well as all aspects of knowledge about managerial activities ( $\rho = 0.22 \dots 0.24$ ,  $p < 0.0001$ ). Spearman correlation analysis demonstrated relationships between job satisfaction and different factors of work environment ( $p > 0.01$ ). Job satisfaction was most closely related to work organisation ( $\rho = 0.50$ ), which in turn depended on managerial support ( $\rho = 0.54$ ), working environment ( $\rho = 0.50$ ), safety ( $\rho = 0.49$ ) and relations with colleagues and managers ( $\rho = 0.43$ ). Managerial support and clarity of work both correlated positively with recognition ( $\rho \geq 0.46$ ) and relations with colleagues and superiors ( $\rho \geq 0.49$ ). Emotional exhaustion was indirectly related to job satisfaction ( $\rho = -0.19$ ), while EE correlated positively with DP ( $\rho = 0.52$ ) and had a weak direct link with PA ( $\rho = 0.14$ ,  $p < 0.05$ ). The levels of EE related negatively to career, security and planning ( $\rho = -0.43$ ) and were to some extent influenced by training, experience and autonomy ( $\rho = -0.40$ ). Professional accomplishment had a weak correlation ( $p < 0.05$ ) with job satisfaction ( $\rho = 0.16$ ), work organisation ( $\rho = 0.16$ ) and work safety ( $\rho = 0.15$ ).

Binary logistic regression analysis resulted in a model that included five groups of factors (satisfaction with management, information about results achieved and progress toward goals, work organization and working environment, as well as factors related to career, security, autonomy and planning of work) that accounted for 51 percent of the variation in the overall

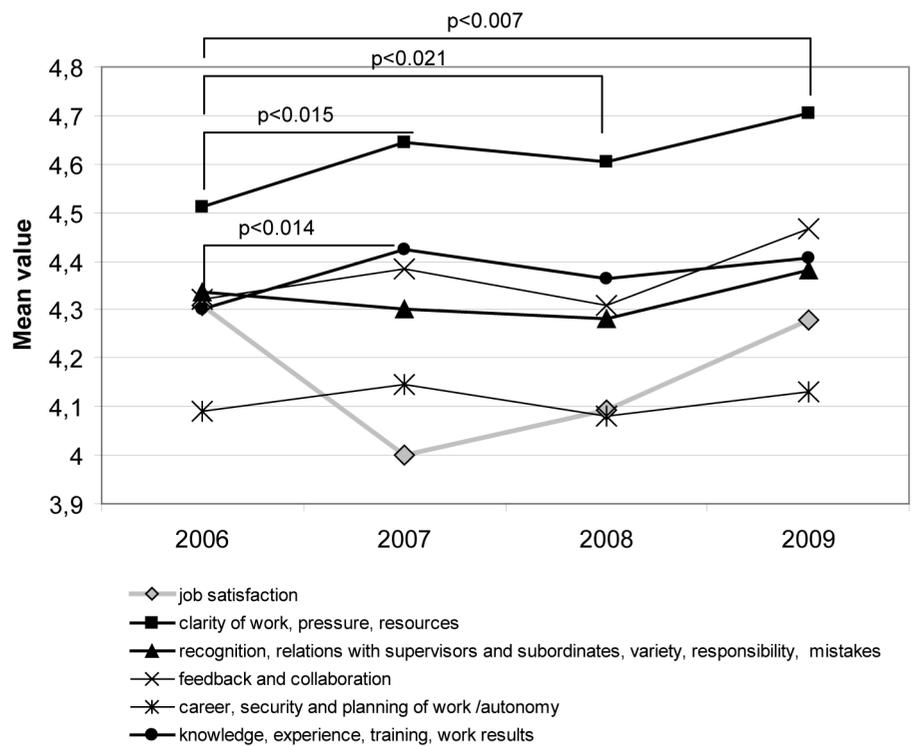


Fig. 3. Dynamics of job satisfaction and psychosocial working environment in 2006–2009 (a significant changes of job satisfaction dynamics are the same as it shown on the Figure 1)

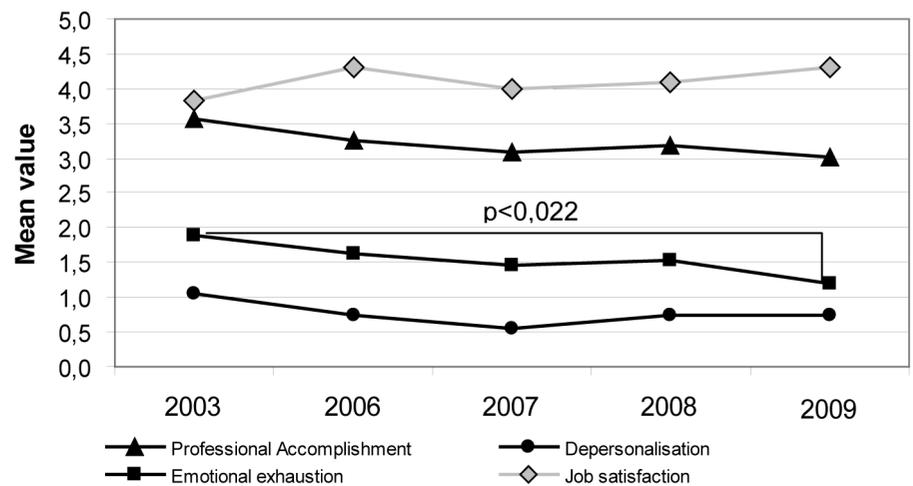


Fig. 4. Dynamics of job satisfaction and burnout indicators in 2003 and 2006–2009 (a significant changes of job satisfaction dynamics are the same as it shown on the Figure 1).

job satisfaction scale (Table 2). The other groups of work stress factors, such as clarity of work, pressure and resources, recognition, interpersonal relations, responsibility, mistakes, interpersonal relations, knowledge, competence, training and work results, did not significantly impact overall job satisfaction.

### DISCUSSION

The main objectives of this study were to examine job satisfaction trends and its components before and after the implementation of quality improvement

activities in a dental clinic. The study also analysed the role of different factors in determining job satisfaction. As previous studies had shown, the implementation of quality improvement activities in health care organisations has led to increased job satisfaction in staff (3–6). Thus, the similar result immediately after the implementation of ISO QM system was expected. However, the rapid decrease in job satisfaction level after one year was a surprise, both for the researchers and for the clinic's management. Over the two subsequent years, the job satisfaction rate reached the same level as it had in 2006. One reason for such development could be related to the staff's experience and expectations. During the implementation of ISO standards, almost all staff was involved in the process and everyone felt that they were a part of process and able to discuss their work openly. Because participation in such a process may promote the organisational culture and overcome organisational boundaries (22), and could be positively influence on staff's motivation and job satisfaction. Still, it seems that after implementing the most essential changes, the meetings became less frequent, although staff members still expected more feedback from their colleagues and managers. It is possible, therefore, that there was a gap between some expectations and experience, which might have an effect on the level of satisfaction (23). Another reason for the decrease in the job satisfaction level during the first years of the changes could be related to the implementation of new rules and changes in the everyday work, which could have caused some problems in work organisation and deteriorating relations with managers. Additionally, this was also the period within which the clinic grew rapidly – the number of staff increased from 77 in 2006 to 107 in 2009. Organisational restructuring has been found to affect organisational well-being, which may lead to a decrease in job satisfaction (24). Thus, besides the implementation of a new organisational culture, the entire environment changed and people who previously worked in smaller teams had to adapt to working in a larger organisation. This theory is supported by the fact that evaluation of knowledge about managerial activities and managerial satisfaction, as well as almost all as-

pects of the work environment and work organisation, demonstrated the same trend as the level of job satisfaction. It seems that, by 2009, most of these problems had been overcome, the work environment had stabilised and satisfaction with all work-related aspects had again reached the previous level. If the changes have been overcome, the greater staff numbers may even have a positive effect on job satisfaction (9).

The second objective was to analyse the role of various factors in determining job satisfaction. Five determinants were found to predict job satisfaction. As was the case in previous studies, satisfaction with leadership, good collaboration as well as adequate information about the goals and strategy organisation, had positive effects on job satisfaction (10–12). The results of present study proved that job satisfaction was also related to staff awareness about economic situation and payment principles. In addition to the managerial activities, the other work-related factors such as job security and work environment hygiene and safety play an important role in job satisfaction (13–16). Research over the last 30 years has established the complexity of the construct and has placed the individual stress experience within a larger organisational context of people's relation to their work and satisfaction (25). Earlier studies have suggested that dentistry, as an occupation, is highly stressful because of the magnitude of mortality and morbidity among dentists (26, 27). The studies by Cooper and colleagues confirmed that coping with difficult patients, keeping schedules and work overload were the factors that created the most pressure on dentists in their work and influencing job satisfaction (7, 27, 28). Whilst job satisfaction in the present study was not affected by age, service length or workload, the Cooper study group demonstrated that younger dentists with shorter service length had lower job

**Table 1.** Descriptive data of the study groups by the years 2003 and 2006–2009

Study year	Number of participants	Average age $\pm$ SD (min-max)	Average service length $\pm$ SD (min-max)	Average load per week $\pm$ SD (min-max)	Response rate (%)
2003	36	39.3 $\pm$ 10.8 (25-63)	4.8 $\pm$ 7.2 (0-45)	-	63.2
2006	46	38.9 $\pm$ 11.4 (21-68)	4.3 $\pm$ 4.3 (0-26)	33.0 $\pm$ 10.4 (7-50)	60.0
2007	62	38.1 $\pm$ 12.6 (21-63)	4.4 $\pm$ 2.9 (1-10)	32.1 $\pm$ 11.5 (6-60)	70.5
2008	86	39.8 $\pm$ 10.7 (21-63)	4.7 $\pm$ 3.5 (0-17)	32.7 $\pm$ 11.3 (6-60)	89.6
2009	72	40.0 $\pm$ 11.7 (20-71)	5.7 $\pm$ 6.5 (0-50)	35.2 $\pm$ 8.6 (9-50)	67.2
Total	264	39.4 $\pm$ 11.3 (19-71)	4.9 $\pm$ 4.5 (0-50)	33.3 $\pm$ 10.5 (6-60)	71.8

satisfaction than their older, longer-serving counterparts (8). The present study stress that satisfaction with work organisation and working environment was likely to be determined by managerial support, interpersonal relationships, security, good planning of work and career of employees in a dental clinic.

Analysis of the dynamic changes in job satisfaction, together with indices of the psychosocial work environment in 2003 and 2006-2007 shows conflicting tendencies. Although job satisfaction in 2006-2007 sharply decreased, a steady improvement was recorded in work safety in 2006-2009. In the period of improved job satisfaction, 2007-2008, the stress level tended to increase, because the factor scores of work organisation, managerial support, career, knowledge and interpersonal relations worsened. Since 2008, job satisfaction, feedback, collaboration, managerial support, work organisation and information showed similar dynamics to increase.

Albeit all the burnout indicators decreased during the study period, the both EE and DP were predicted by low job satisfaction, poor work organisation, low managerial support, poor career, experience, training, planning and poor collaboration.

There was a negative correlation between almost of all work environment factors and burnout indicators EE and DP levels measured among study population. Usually, positive correlations between the levels of EE and DP and work stress have been observed (30). However, an indirect link between cynicism and stress levels was also found by McManus and co-authors in 2002 (16). Low control and lack of support were

clearly demonstrated to have an adverse effect on mental health of workers (29). The professionalism scores showed contrary dynamics with job satisfaction, referring to opposite opinion of the results have been found by Taskaya-Yilmaz and co-authors (2004) where the levels of personal accomplishment proportionally increased with daily working hours among dental research assistants (31). Controversial results have seen in research on work stress and health among Estonian health care workers reporting less stress despite a higher burnout levels, lack of career and management or poor resources (32). The low incidence of burnout during major organisational change, when there were many obstacles to overcome, might be caused by positive strain, in which improvements give workers a “new breath”. Although job satisfaction increased during the years 2007-2009, the lowered professionalism levels showed signs of burnout among the staff of dental clinic.

The availability of follow-up data makes possible to evaluate the immediate effect of intervention, as well as the prolonged impact of quality improvement activities on staff members' job satisfaction. Because of all the clinic staff was included in the study the reliability of the results is high and the response rate is acceptable when to compare with previous studies (12, 31, 33). However, in 2003 the lack of detailed data about work environment and stress factors before implementing the QM system could be considered to be a limitation of the study. Still, considering the correlations between those factors and job satisfaction, the authors strongly believe that implementation of the QM system has led to a significant improvement in work organisation, environment safety and satisfaction. The implementation of the QM system in the dental clinic predisposed a better overcome of negative influences of economic crises since 2007.

## CONCLUSIONS

As discussed above, this follow-up study clearly demonstrates improved job satisfaction and work environment with reference to implementation of a QM system, when management pays a great deal of attention to organisational change. Work environment factors, managerial style, awareness and burnout indices are reliable predictors of work satisfaction during quality improvement process. Among the focus points of the change were acceptable management and leadership

**Table 2.** Predictors of job satisfaction ( $R^2=0.51$ )

Factors	Odds ratio	95% CI	p-value
Satisfaction with the leadership and management of the clinic			
Less satisfied	1		
Very satisfied	5.235	1.892-14.486	0.001
Information about the results achieved & progress toward goals			
Less informed	1		
Well informed	4.524	1.627-12.583	0.004
Work organisation			
Mean value <4.50	1		
Mean value $\geq 4.50-5.00$	4.738	1.479-15.175	0.009
Working environment and hygiene			
Mean value <4.50	1		
Mean value $\geq 4.50-5.00$	4.103	1.338-12.584	0.014
Career, security and planning			
Mean value <4.50	1		
Mean value $\geq 4.50-5.00$	4.437	1.569-12.549	0.005

and adequate information about what is going on in the organisation, as well as good working, safety and hygiene conditions. In conclusion, while all organisational changes put a strain on the psychosocial milieu, if the outcome of improvement process is positive, staff will be more satisfied and perceived less negative influences of economic crisis in their work.

### DECLARATION OF COMPETING INTERESTS

The authors declare that they have no competing interests.

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### AUTHORS' CONTRIBUTIONS

EM and KP completed the questionnaire, carried out the studies and data analysis, data interpretation and writing. GM contributed to data interpretation and drafting the manuscript. All authors read and approved the final manuscript.

### REFERENCES

1. Heaton K. External peer review in Europe: an overview from the ExPeRt project. *Int J Qual Health Care* 2000; 12: 177–82.
2. Klazinga N. Re-engineering trust: the adoption and adaptation of four models for external quality assurance of health services in Western European healthcare systems. *Int J Qual Health Care* 2000; 12: 183–89.
3. Lee L-C, Yang K-P, Chen T-Y. A quasi-experimental study on a quality circle program in a Taiwanese hospital. *Int J Qual Health Care* 2000; 12: 413–8.
4. Tausch BD, Härter MC. Perceived effectiveness of diagnostic and therapeutic in primary care quality circles. *Int J Qual Health Care* 2001; 13: 239–46.
5. Varkey P, Karlapudi SP, Hensrud DD. The impact of a quality improvement program on employee satisfaction in an academic microsystem. *Am J Med Qual* 2008; 23: 215–21.
6. Hein S, Lauterbach KW, Plamper E, Gerber A. The influence of quality management on job satisfaction and work load-exemplary study in a German hospital [Article in German]. *Z Evid Fortbild Qual Gesundheitswes* 2009; 103: 219–27.
7. Cooper CL, Mallinger M, Kahn R. Identifying sources of occupational stress among dentists. *J Occup Psychol* 1978; 51: 227–34.
8. Cooper CL, Watts J, Baglioni AJ, Kelly M. Occupational stress amongst general practice dentists. *J Occup Psychol* 1988; 61: 163–74.
9. Roth SF, Heo G, Varnhagen C, Glover KE, Major PW. Job satisfaction among Canadian orthodontists. *Am J Orthod Dentofacial Orthop* 2003; 123: 695–700.
10. Krogstad U, Hofoss D, Veenstra M, Hjortdahl P. Predictors of job satisfaction among doctors, nurses and auxiliaries in Norwegian hospitals: relevance for micro unit culture. *Hum Resour Health* 2006; 4:3.
11. Chen YM, Johantgen ME. Magnet Hospital attributes in European hospitals: a multilevel model of job satisfaction. *Int J Nurs Stud* 2010; 47: 1001–12.
12. Kaarna M, Pölluste K, Lepnurm R, Thetloff M. The progress of reforms: job satisfaction in a typical hospital in Estonia. *Int J Qual Health Care* 2004; 16: 253–61.
13. Puriene A, Petrauskienė J, Janulyte V, Balciuniene I. Factors related to job satisfaction among Lithuanian dentists. *Stomatologija, Baltic Dental and Maxillofacial Journal* 2010; 9(4): 109–13.
14. Roth SF, Heo G, Varnhagen C, Glover KE, Major PW. Occupational stress among Canadian orthodontists. *Angle Orthod* 2003; 73: 43–50.
15. Roth SF, Heo G, Varnhagen C, Major PW. The relationship between occupational stress and job satisfaction in orthodontics. *Am J Orthod Dentofacial Orthop* 2004; 126: 106–9.
16. McManus IC, Winder BC, Gordon D. The causal links between stress and burnout in a longitudinal study of UK doctors. *The Lancet* 2002; 359: 2089–90.
17. Koppel A, Kahur K, Habicht T, Saar P, Habicht J and van Ginneken E. Estonia: Health system review. *Health Systems in Transition* 2008; 10(1): 1–230.
18. Pölluste K, Habicht J, Kalda R, Lember M. Quality improvement in the Estonian health system – assessment of progress using an international tool. *Int J Qual Health Care* 2006; 18: 403–13.
19. Kenny DJ, Conway RM, Johnston DH. The development of ISO 9002 quality management standards for Canadian dental practices. *J Can Dent Assoc* 1999; 65: 105–8.
20. Casas MJ, Kenny DJ, Johnston DH. Experience of 2 dental clinics registered to ISO 9002. *J Can Dent Assoc* 2003; 69: 215–8.
21. Maslach C, Jackson SE, Leiter MP. 1981. Maslach Burnout Inventory Manual (3rd edition). Palo Alto: Consulting Psychologist Press, 1986.
22. Greenfield D, Pawsey M, Braithwaite J. What motivates professionals to engage in the accreditation of healthcare organizations? *Int J Qual Health Care* 2011; 23: 8–14.
23. Øvretveit J. Quality Health Services. Research Report, BIOS. Uxbridge, Middlesex: Brunel University, 1990.
24. Arnetz BB. Staff perception of the impact of health care transformation on quality of care. *Int J Qual Health Care* 1999; 11: 345–51.
25. Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol* 2001; 52: 397–422.
26. Myers HL, Myers LB. „It’s difficult being a dentist“: stress and health in the general dental practitioner. *British Dental J* 2004; 197(2): 89–93.
27. Puriene A, Janulyte V, Musteikyte M, Bendinskaite R. General health of dentists. Literature review. *Stomatologija, Baltic Dental and Maxillofacial Journal* 2007; 9: 10–20.
28. Rogers C, Malone KM. Stress in Irish dentists: developing effective coping strategies. *Practice Management, Journal of Irish Dental Association* 2010; 55(6): 304–7.
29. Escribà-Agüir V, Perez-Hoyos S. Psychological well-being and psychosocial work environment characteristics among emergency medical and nursing staff. *Stress and Health* 2007; 23(3): 153–60.
30. Piko BF. Burnout, role conflict, job satisfaction and psychosocial health among Hungarian health care staff: A questionnaire survey. *Int J Nurs Stud* 2006; 43: 311–8.

31. Taskaya-Yilmaz N, Ceylan G, Güler AU, Ergun G, Can-kaya B, Bek Y. The level of burnout in a group of dental research assistants. *Stress and Health* 2004; 20: 105–11.
32. Merisalu E, Vähi M, Männik K, Põlluste K. Relationships between work stress, burnout and health of health care workers. Proceedings of the Special Session in the Annual Meeting of the Baltic Sea Network on Occupational Health and Safety, Sept 30 – Oct 01, 2010. Occupational Health of Health Care Workers. Ed by: Lehtinen, S., FIOH. Helsinki, 2011; 25–40.
33. Cook JV, Dickinson HO, Eccles MP. Response rates in postal surveys of healthcare professionals between 1996 and 2005: An observational study. *BMC Health Serv Res* 2009; 9: 160.

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