Predictors of good general health, well-being, and musculoskeletal disorders in Swedish dental hygienists

Viola Ylipää, Bengt B. Arnetz and Hans Preber

Department of Public Health Sciences and Departments of Periodontology and Dental Hygiene, Institute of Odontology, Karolinska Institutet, Huddinge, Sweden; Department of Public Health and Caring Sciences, Uppsala Science Park, Uppsala, Sweden

Ylipää V, Arnetz BB, Preber H. Predictors of good general health, well-being, and musculoskeletal disorders in Swedish dental hygienists. Acta Odontol Scand 1999;57:277–282. Oslo. ISSN 0001-6357.

The aim of the present study was to examine how different personal, physical, and psychosocial work-associated factors are related to good general health, well-being, and musculoskeletal disorders in dental hygienists. A questionnaire was mailed to 575 dental hygienists who were randomly sampled from the Swedish Dental Hygienists' Association (86% responded). Data were analyzed with multiple-logistic regression models. The results showed that high clinical-practice fraction, active leisure, and high management support increased the odds for good general health, while work and family overload decreased the odds. Management support and mastery of work increased the odds for well-being, while work and family overload and high work efficiency decreased them. Scaling work increased the odds for general and work-related musculoskeletal disorders in all parts of the upper body and arms but not in the lower back. In the upper body, active leisure decreased the odds for general musculoskeletal disorders, while the odds for work-related musculoskeletal disorders increased from work and family overload and decreased from many weekly working hours. Many years in the profession increased the odds for general finger disorders. In conclusion, the results suggest that active leisure and several psychosocial work factors strongly influence good general health and well-being. Physical tasks influence musculoskeletal disorders more than active leisure and psychosocial work factors. □ *Dental hygienist; health; life-style; stress; work*

Viola Ylipää, Department of Dental Hygiene, Institute of Odontology, Karolinska Institutet, Box 4064, SE-141 04 Huddinge, Sweden. Tel. +46 8 728 8271, fax. +46 8 728 8275, e-mail. Viola.Ylipaa@ofa.ki.se

Musculoskeletal disorders are reported as the main health problem in dental hygienists (1–4). Increased requirements for higher efficiency (5), in combination with repetitive work tasks (1, 2), might increase stress, contribute to more suffering from musculoskeletal disorders, and influence general health and well-being in dental hygienists. Studies of other healthcare professionals have shown that many psychosocial work factors are related to musculoskeletal disorders (6, 7). Also life-style factors, such as smoking, leisure activities, and physical exercise, are in different ways related to musculoskeletal disorders (1, 4, 6, 7), although they are less studied in dental hygienists (2, 4, 8).

The use of a multifactorial approach for studying health and well-being reveals that there is a need to study a range of factors from several domains in relation to several health and well-being measures (9). Studies of female-dominated professionals indicate that special attention must be paid to the influences of work and family on health and well-being (10–12). A multifactorial approach also searches for the impact of work-related health and well-being resources (13, 14), such as aspects of social support (6), the less-studied mastery of work (a person's perception of having produced successful work outcomes (15)), and personal commitment (a person's participation and willingness to contribute to policies, flexibility, and innovative, practical improvements in the workplace (16)).

The aim of the present study was to examine how different personal, physical, and psychosocial work-associated factors are related to good general health, well-being, and musculoskeletal disorders in dental hygienists.

Material and methods

Hypothetical model

The base for this study is a hypothetical model that originates from stress research (13, 14, 18, 19). The model was further developed to fit this study of dental hygienists, thus enabling broad conclusions to be drawn regarding health and well-being within personal and work domains (Fig. 1).

In this study, health is defined as dental hygienists' perception and evaluation of good general health and well-being and lack of symptoms of musculoskeletal disorders as consequences of stress in personal and work domains (13, 14, 17–19).

Subjects and questionnaire

In 1998, a self-reporting questionnaire on work environment was randomly distributed to 575 members of the Swedish Dental Hygienists' Association (it covered 95% of all Swedish dental hygienists). The questionnaire contained 275 items. Scales from previous occupational research were used in their original form, revised, or

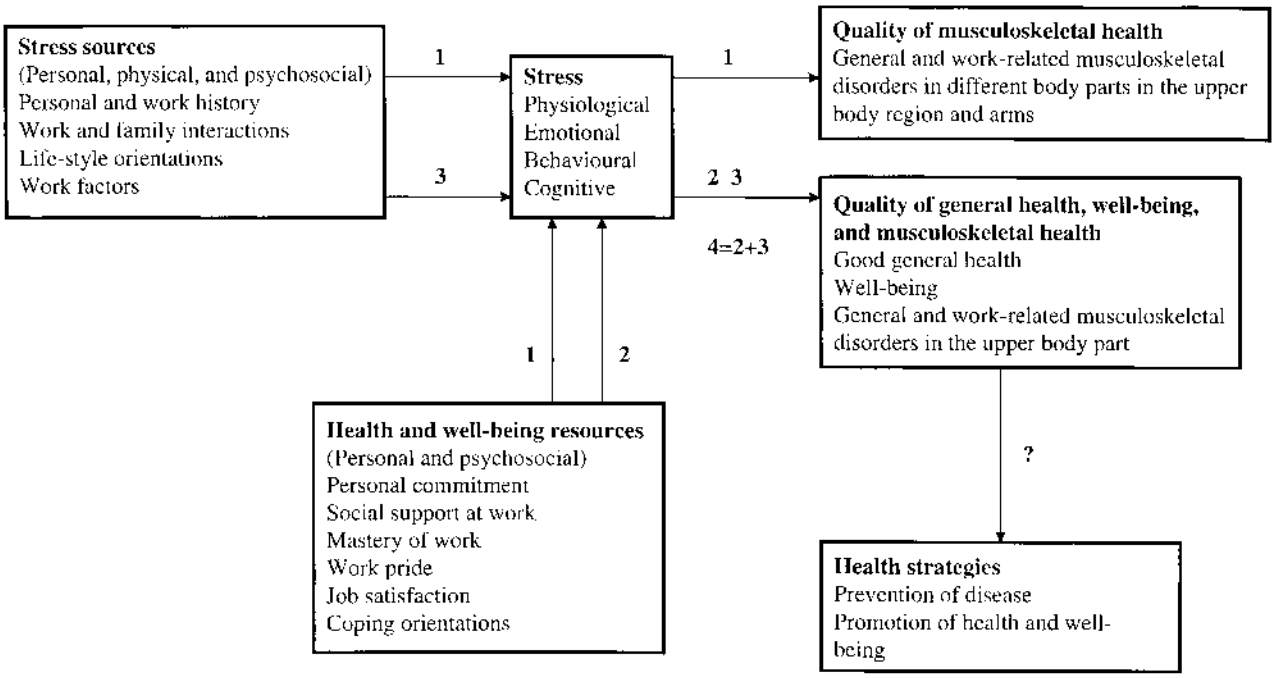

Fig. 1. A hypothetical model illustrating the work and health relationship including stress sources, health and well-being resources, stress and quality of musculoskeletal health, general health and well-being, as well as health strategies, i.e. possible issues raised by the results. The numbers beside the arrows illustrate the separate stages in the statistical analyses and a combined analysis, i.e. number 4. The arrows show further possible directions in the stress processes.

further developed to measure specific aspects of the working life of dental hygienists. The respondents were asked to rate their perceptions about work environment, health, and well-being on Likert-type scales. The instrument measured: background factors, work and family interactions (20), life-style (4, 8, 16), physical and psychosocial work factors (2, 20), social support at work (16), work-related attitudes and behaviors (16, 20), and job (dis)satisfaction. Health and well-being measured global, self-rated health (15, 17), mental well-being (12, 16) as well as general and work-related musculoskeletal disorders (2, 4, 16, 21). For mailing purposes, there was an ID assigned to each questionnaire. Two reminders were sent to non-responders.

Statistical analyses

The 1994 version of BMDP for the PC was used for data analyses (22). Factor analysis (oblique rotation) was used to reduce the number of variables by factor-based scores. Factor loading was ≥ 0.70 for high discrimination in scales; the Cronbach alpha reliability coefficient was ≥ 0.70 for high homogeneity in scales; and the inter-scale correlation was <0.60 for reasonable scale independence (22–24).

K-means clustering and chi-square tests were used to screen the data and to reduce the amount of variables for the multivariate analysis. Multiple stepwise logistic regressions modeling was used to predict the odds of personal and work-environment exposures and health and well-being resources in relation to outcome measures of health and well-being. Testing subsets of variables, using logistic regression models, identified possible exposures and resources of health and well-being.

Health and well-being resources were forced into the final stepwise logistic health and well-being models to test the impact of the resources within the work and health relationship. Finally, the same prognostic variables were tested to predict general and work-related musculoskeletal disorders in the upper body and in the hands/wrists/fingers. Age was controlled for (i.e., forced into the logistic models) in the analyses. A p-value <0.05 was considered to indicate statistical significance (22, 24).

Ethical approval

The Ethics Committee of the Karolinska Institute approved this study.

Results

Demographics, good general health, well-being, and musculoskeletal disorders

An 86% response rate was obtained. This study consisted of 98.4% female and 0.6% male dental hygienists. The mean age was 44; the SD (range) was 9

Table 1. Stepwise logistic regression models

	Prognostic variables	Log odds coefficient	SE	OR*	OR 95% CI†	*P*-value
Good general health	Clinical practice fraction	0.72	0.25	2.1	1.3–3.4	0.004
Correct predictions 68%	Leisure activities	0.68	0.15	2.0	1.5–2.7	0.001
	Work/family overload	−0.49	0.13	0.6	0.5–0.8	0.001
‡	Management support at work	0.61	0.26	1.9	1.1–3.1	0.020
	Constant	−2.43				
Well-being	Work/family overload	−0.38	0.14	0.7	0.5–0.9	0.008
Correct predictions 73%	Family/work overload	−0.56	0.18	0.6	0.4–0.8	0.003
	Work efficiency	−0.11	0.03	0.9	0.9–1.0	0.006
‡	Mastery of work	0.24	0.09	1.3 (2.1) ϕ	1.1–1.6	0.020
‡	Management support at work	0.53	0.26	1.7	1.0–2.8	0.050
	Constant	−0.47				
Musculoskeletal disorders/upper body	Work/family overload	0.23	0.12	1.3	1.0–1.6	0.050
In general	Leisure activities	−0.43	0.15	0.7	0.5–0.9	0.004
Correct predictions 70%	Scaling work	0.11	0.02	1.1 (1.9) Π	1.1–1.2	0.001
	Constant	−1.01				
Musculoskeletal disorders/upper body	Work/family overload	0.44	0.14	1.6	1.2–2.1	0.002
During work practice	Scaling work	0.09	0.03	1.1 (1.7) Π	1.1–1.2	0.001
Correct predictions 73%	Leisure activities	−0.33	0.19	0.7	0.5–1.0	0.075
	Hours worked per week	−0.66	0.30	0.5	0.3–0.9	0.030
	Weeks worked per year	0.62	0.34	1.9	1.0–3.6	0.064
‡	Job (dis)satisfaction, lack of help/uncooperative clients	0.10	0.05	1.1 (1.5) $\perp$	1.0–1.2	0.065
	Constant	−4.18				

ORs and 95% CIs of personal and environmental factors related to good general health, well-being, and musculoskeletal disorders within the past month in dental hygienists.
* Odds ratios.
† Confidence intervals.
‡ Health and well-being resources were forced into the final stepwise logistic regression models.
The odds ratios within parentheses are calculated for an increase of 3 ϕ, 6 Π, and 4 $\perp$ scale units.

Table 2. Stepwise logistic regression models—general musculoskeletal disorders

Dependent variables	Prognostic variables	Log odds coefficient	SE	OR	OR 95% CI	*P*-value
Neck	Scaling work	0.19	0.03	1.2 (3.1) Π	1.1–1.3	0.001
Correct predictions 69%	Work/family overload	0.28	0.07	1.3	1.0–1.7	0.020
	Uncooperative clients	−0.25	0.07	0.8	0.7–0.9	0.001
	Constant	3.87				
Shoulder	Scaling work	0.15	0.02	1.2 (2.5) Π	1.1–1.2	0.001
Correct predictions 70%	Work/family overload	0.26	0.11	1.3	1.0–1.6	0.024
	Constant	4.06				
Upper back	Scaling work	0.14	0.03	1.2 (2.3) Π	1.1–1.2	0.001
Correct predictions 71%	Leisure activities	−0.58	0.22	0.6	0.4–0.9	0.015
	Work/family overload	0.38	0.15	1.5	1.1–2.0	0.017
	Constant	−3.32				
Elbows	Scaling work	0.11	0.03	1.1 (1.9) Π	1.1–1.2	0.001
Correct predictions 64%	Smoking	0.46	0.22	1.6	1.0–2.4	0.040
	Constant	−4.74				
Lower back	Work efficiency	0.07	0.03	1.1 (1.3) ∇	1.0–1.1	0.040
Correct predictions 61%	Personal commitment	−0.19	0.09	0.8	0.7–1.0	0.036
	Constant	−0.30				
Hands/wrists	Scaling work	0.13	0.03	1.1 (2.2) Π	1.1–1.2	0.001
Correct predictions 67%	Constant	−4.59				
Fingers	Scaling work	0.14	0.03	1.1 (2.3) Π	1.1–1.2	0.001
Correct predictions 71%	Profession years	0.75	0.34	2.1	1.1–4.1	0.024
	Constant	−4.90				

See notes for Table 1.
ORs and 95% CIs of personal and environmental factors related to musculoskeletal disorders in the last month in different body parts in dental hygienists.
The odds ratios within parentheses are calculated for an increase of 6 Π and 4 ∇ scale units.

Table 3. Stepwise logistic regression models—work-related musculoskeletal disorders

Dependent variables	Prognostic variables	Log odds coefficient	SE	OR	OR 95% CI	*P*-value
Neck	Scaling work	0.11	0.03	1.1 (1.9) Π	1.1–1.2	0.001
Correct predictions 68%	Work relations	−0.05	0.02	1.0	0.9–1.0	0.030
	Smoking	0.28	0.16	1.3	1.0–1.8	0.090
	Uncooperative clients	−0.15	0.06	0.9	0.8–1.0	0.021
	Work/family overload	0.30	0.12	1.4	1.1–1.7	0.002
	Constant	−1.56				
Shoulder	Scaling work	0.13	0.02	1.1 (2.2) Π	1.1–1.2	0.001
Correct predictions 65%	Constant	−1.50				
Upper back	Scaling work	0.08	0.02	1.1 (1.6) Π	1.0–1.1	0.001
Correct predictions 69%	Leisure activities	−0.38	0.17	0.7	0.5–1.0	0.030
	Work/family overload	0.30	0.13	1.4	1.1–1.7	0.020
	Pride of working in current organization	−0.45	0.18	0.6	0.5–0.9	0.020
	Hours worked per week	−0.56	0.26	0.6	0.3–1.0	0.040
	Weeks worked per year	0.68	0.30	2.0	1.1–3.5	0.030
	Constant	−0.33				
Elbows	Scaling work	0.08	0.02	1.1 (1.6) Π	1.0–1.1	0.001
Correct predictions 64%	Difficult clients	0.08	0.04	1.1 (1.4) δ	1.0–1.2	0.055
	Profession years	0.47	0.25	1.6	1.0–2.6	0.057
	Constant	−3.35				
Lower back	Scaling work	0.06	0.02	1.1 (1.4) Π	1.0–1.1	0.003
Correct predictions 62%	Profession years	0.43	0.22	1.5	1.0–2.4	0.051
	Clinical practice fraction	−0.39	0.22	0.7	0.4–1.0	0.073
	Constant	−1.55				
Hands/wrists	Scaling work	0.14	0.03	1.2 (2.3) Π	1.1–1.2	0.001
Correct predictions 63%	Uncooperative clients	−0.16	0.06	0.9	0.8–1.0	0.010
	Constant	−2.31				
Fingers	Scaling work	0.07	0.02	1.1 (1.5) Π	1.0–1.1	0.001
Correct predictions 62%	Constant	−1.86				

See notes for Table 1.
ORs and CIs of personal and environmental factors related to musculoskeletal disorders within the past month in different body parts in dental hygienists, during work practice.
The odds ratios within parentheses are calculated for an increase of 6 Π and 2 δ scale units.

years (22–65). The mean number of years in the profession was 12; the SD (range) was 6 years (0–30). No statistically significant differences between age groups could be demonstrated regarding responses (χ^2 (4) 8.9; $p = 0.1$).

Regarding good general health, 40% reported very good health, 42% good health, and 18% fair, poor, or very poor health. Regarding well-being, 49% were free from physical fatigue, 58% from mental fatigue, and 61% from headaches. Physical fatigue, perceived rather often/always, was reported by 17%, mental fatigue by 16%, and headaches by 14%. The prevalence of general and work-related musculoskeletal disorders concerned the upper body (back of neck, shoulder, and upper back, 61%; 55%), lower back (49%; 39%), and the arms (elbows and arms, hands and wrists and fingers, 36%; 35%). The general and work-related disorders were in the shoulders 72%; 64%, back of neck 68%; 61%, lower back 49%; 39%, and fingers 39%; 38%.

Importance of work, background, and resources on good general health, well-being, and general and work-related musculoskeletal disorders in the upper body

The identified significant resources of health and well-being were: *management support at work* (good general health and well-being), *personal commitment* (well-being and general musculoskeletal disorders), and *mastery of work* and *job (dis)satisfaction*, *lack of help/uncooperative clients* (well-being). The percentage for correct classifications for the regression models was low to acceptable (63–65%).

Table 1 indicates that the odds for good general health increased with high clinical-practice fraction, active leisure, and management support (odds ratios [ORs] 2.1; 2.0; 1.9) and decreased with work and family overload. By *high clinical-practice fraction* we mean that the higher the clinical-work level, the better the hygienist's general health. The odds for well-being increased with management support and mastery of work (ORs 1.7; 1.3). Family and work overload and work and family overload as well as high work efficiency decreased the odds for well-being. The odds for general and work-related musculoskeletal disorders in the upper body increased with work and family overload (ORs 1.3; 1.6) and scaling work (ORs 1.1; 1.1). Active leisure and many weekly working hours decreased the odds for general and work-related disorders. The percentage for correct classifications for the models was acceptable to good (68–73%).

Importance of work and background on general and work-related musculoskeletal disorders in the upper body and arms

Tables 2 and 3 give the models for general and work-related disorders across different body parts. In Table 2, except for lower-back disorders, scaling work was related to general disorders in all body parts, while work and family overload was related to neck, shoulder, and upper-back disorders. Many years in the profession was associated with finger disorders (OR 2.1). Dealing with uncooperative clients and active leisure decreased the odds for neck and upper-back disorders. (Uncooperative clients are reported to be those who are difficult to deal with or those who do not follow hygienists' instructions.) The percentage for correct classifications for models, lower back, and elbows was low (61%; 64%). In Table 3, scaling work is associated with work-related disorders in all body parts, while work and family overload is related to neck disorders and, together with many weeks worked per year, to upper-back disorders. Good work relationships and dealing with uncooperative clients decreased the odds of neck disorders, while active leisure, organizational pride, and many hours worked per week decreased the odds for upper-back disorders. The percentage for correct classifications was low for elbows, lower back, hands/wrists, and fingers (62–64%).

Finally, the same prognostic variables were tested to predict general and work-related musculoskeletal disorders in the areas of the upper body and hands/wrists/fingers. Scaling work was related to general and work-related disorders in these areas. In the upper body, active leisure and dealing with uncooperative clients decreased the odds for general disorders, while work and family overload and longer working time per week (>32 h) increased and decreased the odds for work-related disorders, respectively. In the area hands/wrists/fingers, number of profession years and dealing with difficult clients were associated ($P = 0.07$; 0.06) with general and work-related disorders. The percentage for correct classification for the upper body model was good (69–70%) and for the hands/wrists/fingers fairly low (63–64%).

Discussion

According to the study model (Fig. 1), the present results suggest that a bad fit between a person's capabilities and wants or needs and the demands and characteristics of the environment may contribute to pathogenic reactions, e.g., musculoskeletal disorders, while an optimal fit may contribute to salutogenic reactions, e.g., no disorders and good general health and well-being (13, 14, 18, 19). Stress can arise if dental hygienists do not get support when work problems occur or if they lack the personal capabilities required to cope with excessive job demands. In the long run, intense, frequent, or prolonged stress can contribute to occupational ill health. The regression models (Table 1) support current opinion (13, 14) that different factors contribute to musculoskeletal disorders and good general health and well-being.

However, the present results could indicate that these work exposures have increased in intensity for the dental hygienist—as reflected in increased physical fatigue, headaches (12), disorders in the neck, shoulders, and arms—compared to other health professionals (6, 7) and to dental hygienists in other countries (1, 3). It appears that elbow, shoulder, finger, and hand/wrist problems are increasing at a faster rate than problems associated with the upper body and lower back (2, 4).

Throughout the study (Tables 1–3), perceived stress from work and family interaction (10, 11) influenced overall health and well-being, and it seems obvious that occupational stress could affect family functions. Scaling work was related to all disorders in the upper body and arms but not general disorders in the lower back (Tables 2 and 3), thereby influencing overall musculoskeletal health. Although the effects of scaling work were supported (1–4), these now seem much more extended. Many years in the profession was a predictor of finger disorders—probably a long-term effect of work. Contrary to another study suggesting that many working hours was a predictor of general disorders (2), the work-related disorders in the present study were decreased by many working hours. So, many working hours might contribute to better ergonomic skills, which in turn would prevent work-related disorders. Also, this cross-sectional study, even if controlling for age, might show a healthy-worker effect, i.e. including a group with perfect health, e.g., hygienists interested in ergonomics and with the exception of those with disorders who have changed from full-time work to part-time work. An interesting finding was that work-related disorders in the neck and upper back seem to be more sensitive for psychosocial factors, i.e., work relations and pride at work, than for general disorders. Surprisingly, dealing with uncooperative clients decreased disorders, but this could also mean that few respondents supported the question.

Although no evidence was found for the role of social support on musculoskeletal disorders (6, 7), a supportive management seems to promote good general health and well-being. The positive association between high practice fraction and general health might be interpreted as dental hygienists preferring clinical job tasks (Table 1). The benefits of an active leisure seem to promote general health and prevent musculoskeletal disorders, and, regardless of leisure activity, the more active the leisure and the better the management support, the better the general health. Moreover, the better the management support and the more successful the work outcome (mastery), the better the well-being. While, a similar measure of mastery did not show an association with musculoskeletal disorders (4), here the importance of mastery seems to be primarily on well-being. Because high work efficiency decreased well-being, perhaps their efficient use of time generates higher workloads, which hygienists do not feel good about.

A high response rate as compared to other studies (2–4, 8), use of many validated scales, available dental

hygienists' data from 1995 (2, 4, 8), the focus on health and well-being in the last month, and the use of stepwise, logistic regressions are all factors that strengthen the study. One limitation of the study was the acceptable and fairly low percentage of correctly predicted cases in the regression models, which could mean that additional variables, not included in the models, exert a limited influence on the results. Low predictions could mean that few hygienists reported sufficient support.

In conclusion, the results of this study suggest that active leisure along with psychosocial work factors have a major influence on good general health and well-being, while musculoskeletal disorders are more influenced by physical job task and less by active leisure and psychosocial work factors. Finally, good management appears to be important for employee well-being.

Acknowledgments.—The Swedish Council for Work Life Research, Vårdalstiftelsen and the Institute of Odontology, the Karolinska Institutet, and the Swedish Dental Hygienists' Association supported this study. Statistician Elisabeth Berg, Karolinska Institutet, provided valuable statistical advice.

References

1. Liss GM, Jesin E, Kusiak RA, White P. Musculoskeletal problems among Ontario dental hygienists. Am J Ind Med 1995;28:521–40.
2. Ylipää V, Arnetz BB, Sandelin Benkö S, Rydén H. Physical and psychosocial work environments among Swedish dental hygienists: risk indicators for musculoskeletal complaints. Swed Dent J 1997;21:111–20.
3. Shenkar O, Mann J, Shevach A, Ever-Hadani P. Prevalence and risk factors of upper extremity cumulative trauma disorder in dental hygienists. Work 1998;11:263–75.
4. Ylipää V, Arnetz BB, Preber H. Factors that affect health and well-being among dental hygienists—a comparison of Swedish dental practices. J Dent Hyg 1999. In press.
5. Bejerot E, Söderfeldt B, Aronsson G, Härenstam A, Söderfeldt M. Perceived control systems, work conditions and efficiency among Swedish dentists: interaction between two sides of Human Resource Managment (submitted).
6. Lagerström M, Wenemark M, Hagberg M, Wigaeus Hjelm E. Occupational and individual factors related to musculoskeletal symptoms in five body regions among Swedish nursing personnel. Int Arch Occup Environ Health 1995;68:27–35.
7. Brulin C, Gerdle B, Granlund B, Höög J, Knutson A, et al. Physical and psychosocial work-related risk factors associated with musculoskeletal symptoms among home care personnel. Scand J Caring Sci 1998;12:104–10.
8. Ylipää V, Arnetz BB, Preber H, Sandelin Benkö S. Determinants of work satisfaction among Swedish dental hygienists. Scand J Caring Sci 1996;10:247–53.
9. Bongers PM, de Winter CR, Kompier MAJ, Hildebrandt VH. Psychosocial factors at work and musculoskeletal disease. Scand J Work Environ Health 1993;19:297–312.
10. Zedeck S, Moiser KL. Work in the family and employing organization. Am Psychol 1990;45:240–51.
11. Schwartzberg NS, Scher Dytell R. Dual-earner families: the importance of work stress and family stress for psychological well-being. J Occup Health Psychol 1996;1:211–23.
12. Pettersson I-L, Arnetz BB, Arnetz JE, Hörte L-G. Work environment, skills utilization and health of Swedish nurses—results from a national questionnaire study. Psychother Psychosom 1995;64:20–31.
13. Antonowsky A. The salutogenic model as a theory to guide health promotion. Health Promot 1996;11:11–8.
14. Ryff CD, Singer B. The contours of positive human health. Psychol Inq 1998;9:1–28.
15. Lindström K. Psychosocial criteria for good work organization. Scand J Work Environ Health 1994;20:123–33.
16. Arnetz B. Technological stress: psychophysiological aspects of working with modern information technology. J Work Environ Health 1997;23 Suppl 3:97–103.
17. FRN. Swedish Council for Planning and Coordination of Research. Self-rated health. A useful concept in research, prevention and clinical medicine. Report 96:9. Uppsala: Ord och Form AB, 1996.
18. Levi L. Psychosocial environmental factors and psychosocially mediated effects of physical environmental factors. Scand J Work Environ Health 1997;23 Suppl 3:47–52.
19. Lazarus RS, Launier R. Stress-related transactions between person and environment. In: Pervin LA, Lewis M, editors. Perspectives in international psychology. New York: Plenum Press, 1994. p. 287–327.
20. Review of psychological and social factors at work and suggestions for the general Nordic questionnaire (QPS Nordic). Nord 1997:15. Nordic Council of Ministers. Copenhagen, 1997.
21. Hagberg M, Christiani D, Courtney TK, Halperin W, Leamon TB, et al. Conceptual and definitional issues in occupational injury epidemiology. Am J of Ind Med 1997;32:106–15.
22. Dixon WJ, editor. BMDP Statistical Software Manual, rev. Berkeley: University of California Press, 1992 and BMDP New System 1994.
23. Carey RG, Seibert JH. A patient survey system to measure quality improvement: questionnaire reliability and validity. Med Care 1993;31:834–45.
24. Multivariate Data analysis. Hair JF Jr, Anderson RE, Tatham RL, Black WC. 5th ed. Englewood Cliffs, NJ: Prentice-Hall, 1998.

Received for publication 27 April 1999
Accepted 22 September 1999