

Occupational Stress Among Icelandic Nurses 1

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Occupational Stress, Job Satisfaction, and Working Environment among Icelandic Nurses:
a cross sectional questionnaire survey.

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Abstract

This study explored what factors contribute to work-related stress in a national sample of Icelandic nurses (N=206) working within and outside hospitals. The importance of understanding what factors contribute to nurse stress is universal in light of the present world wide nurse shortage. The study identifies which sources of occupational stress are specific to each of the two groups. Hospital nurses report more work overload while nurses working outside the hospital complain of monotonous and repetitive work. The findings also suggest that the strenuous conditions of Icelandic nurses are felt more severely among the hospital nurses. Preventive measures are suggested based on the findings on how to diminish occupational stress among nurses and thereby contribute to retaining them in the workforce.

Key words: Occupational stress, job satisfaction, working environment.

Increased workload among nurses, growing occupational stress, and declining job satisfaction are major concerns for nurse managers and nursing educators. Numerous studies have shown that nursing is strenuous work and hence that occupational stress is prevalent among nurses (Elfering et al., 2002; Lavanco, 1997; Lee and Wang, 2002; Santos et al., 2003). A strong negative relation has been found between nurses' occupational stress and job satisfaction (Blegen, 1993), and it has also been reported that growing occupational stress results in increasing turnover rate and causes more and more nurses to leave the nursing profession (Shader et al., 2001). In addition to these serious consequences, a high level of occupational stress has been found to reduce nursing quality (Tarnow-Mordi et al., 2000). This development is deemed to be one of the reasons why fewer young people are entering the nursing profession (Booth, 2002).

Due to insufficient staffing, nurses experience difficulties in meeting patient needs. They become frustrated about their inability to complete their work to their professional satisfaction and express wishes to leave the nursing profession (Hegney et al., 2003). Furthermore, occupational stress has been found to be one of the major work-related health problems (Gray, 2000). Therefore, it is important to understand how work-associated stress affects nurses, and what factors in their working environment cause the greatest burden. It is also of great importance to gain more knowledge of nurses' working conditions, occupational stress and job satisfaction – knowledge that might be used to decrease nurses' occupational stress and increase their job satisfaction. In an effort to contribute to the development of such knowledge, the Icelandic Nurses' Association collaborated with the Institute of Nursing Research at the University of Iceland (Biering & Sveinsdóttir, 2001) on a survey on the workload, working conditions, occupational stress, health, and job satisfaction among Icelandic nurses. The purpose of the survey was to obtain information that could be used by administrators in health institutions and the Icelandic Nurses'

Association to improve nurses' working conditions. A further purpose was to create a database that could be used by researchers to study the relationship between the factors on which data was gathered. This present study uses data from that database to answer questions concerning occupational stress among Icelandic nurses, and how it is related to working environment and institutional settings.

Various factors are associated with occupational stress. Studies indicate that in addition to stressful factors intrinsic to nursing, organizational and management attributes influence work-related stress among nurses (Stordeur et al., 2001; Makinen et al., 2003), and that sources of stress vary in both nature and frequency across nursing specialties (Siu, 2002; Tummers et al., 2001). Researchers have also concluded that occupational stress arises from social arrangements that are partially determined by the organization of work (Cooper, 1998) and from the interaction between these organizational factors and the characteristics of individual workers (Makinen et al., 2003). In other words, occupational stress in nursing is to a great extent determined by how successfully each individual nurse copes with the job-related stress factors in his or her workplace. At different workplaces nurses are confronted with different work tasks (e.g., night shifts), working conditions and stressful situations, for example, emotional suffering and death of patients. Consequently, this research set out to examine similarities and differences in the perceptions of workload and occupational stress of nurses working within and outside hospital settings. The objectives of this study are: (1) To describe and compare occupational stress, job satisfaction, working conditions, support from co-workers and opportunities to develop professional skills among Icelandic nurses working within and outside the hospital environment; (2) To predict what factors contribute to work-related stress among Icelandic nurses working within and outside the hospital environment.

Literature review: The context of the study

Heavy workload and the consequent occupational stress can have serious consequences for nurses and their patients. A strong relation has been found between stress and job satisfaction (Blegen, 1993), and it has been demonstrated that workload and work-associated stress increase the turnover rate (Shader et al., 2001). A new multi-country study, conducted by the World Health Organization (2003) on the international migration and mobility of nurses, found that inadequate working conditions are one of the main factors driving nurse migration. Low wages, lack of resources to work effectively, limited career opportunities, and limited educational opportunities are other important factors. Because of insufficient staffing levels nurses become frustrated about their inability to complete their work to their professional satisfaction, and they experience difficulties in meeting patient's needs (Hegney et al., 2003). Furthermore, heavy workload and a high level of occupational stress diminish nursing quality (Bailit and Blanchard, 2004; Sochalski, 2004). Heavy workload can have a devastating effect and threaten the life and security of patients as the study by Tarnow-Mordi et al. (2000) demonstrated, for they found that inadequate nursing staffing in an intensive-care unit increased patients' mortality rate.

Numerous studies in different parts of the world indicate that these conditions are universal. These studies have found that nursing is very strenuous work that causes a variety of pathological symptoms. For example, Elfering et al. (2002) found that nurses in Switzerland are at risk for low-back pain; Lavanco (1997) found that in Sicily burnout is more prevalent among nurses than teachers, and Stordeur et al. (2001) found that emotional exhaustion was the consequence of work-related stress factors among Belgian nurses. Occupational stress among nurses is associated with a variety of personal and institutional factors. For example, Lee and Wang (2002) found that a high level of

occupational stress among Taiwanese nurses was related to workloads, personal responsibility, working experience and education. Santos et al. (2003) found that among nurses in Missouri USA, occupational stress was related to the physical environment and responsibility. Studies indicate that, in addition to nursing itself, organizational and management characteristics influence the stress nurses experience at work (Santos et al., 2003; Stordeur et al., 2001).

The defining and causal attributes of occupational stress have been identified and described in several but different ways. Marshall (1980) identified nine main elements of potential stress related to nursing. These were: the nature of nursing tasks, workload, involvement with death and dying, uncertainty, responsibility, role conflicts, relationships, the home/work interface, and fulfilling others' expectations for the role of the nurse. Rutenfranz, Knauth, and Angersbach (1981) proposed that occupational stress is the result of interaction between characteristics of individual workers, resources and stress factors, which are any physical, mental or social factors related to the work environment, and Cooper (1998) concluded that occupational stress arises from social arrangements that are partially determined by the organization of work. The concepts "work environment" and "organization of work" apply to both general factors, such as organizational and managerial characteristics, and factors applying to individual workers. In the nursing profession these factors vary greatly. Healthcare institutions are different in size and nature, and nurses are confronted with different work tasks and working hours (e.g., night shifts), working conditions (e.g., understaffing) and stress related situations, such as, the suffering and death of patients.

There is evidence to suggest that these work-related stress factors vary, both in nature and frequency, across specialties (Marshall, 1980). A large number of studies on stress in nurses has been conducted in high dependency units, especially within general

nursing (Wheeler and Riding, 1994; Stordeur et al., 2001; Schmitz et al., 2000), but only a minority of studies investigated community nurses, and it has been indicated that stressors related to organizational structure and institutional culture matter rather than stress from nursing tasks. Blair and Littlewood (1995) emphasized organizational structure, the work/home interface, work relationships, lack of consultation and the involvement in organizational change as potential stressors, while Slater (as cited in Snelgrove, 1998) accentuated interpersonal relationships within primary healthcare teams. In order to structure any preventive measures, it is necessary to identify sources of job-related workloads specific to each occupational group. However, comparative analysis of stressors may illuminate both similarities and differences, which may, for instance, help with the distribution of resources (Snelgrove, 1998).

As discussed above, numerous studies have found that stressful conditions are prevalent in the nursing profession. These stressful conditions are universal and researchers in various parts of the world, e.g. Australia (Tarnow-Mordi et al., 2000), Belgium (Stordeur et al., 2001), Great Britain (McGowan, 2001; Payne, 2001), Greece (Alexopoulos et al., 2003), Ireland (Wynne et al., 1993), Switzerland (Jakob and Rothen, 1997), Taiwan (Lee and Wang, 2002) and in the US (Santos et al., 2003) have shown that nurses have to cope with a strenuous workload and occupational stress. There are no published studies of stress and workload among Icelandic nurses, who are the subjects of this study, so it is important to find out if they experience occupational stress in ways similar to nurses in other countries. Because of different working conditions, education, social status and the autonomy of nurses in different cultures, it can be assumed that occupational stress differs between cultures and countries. Therefore, there is a need to examine work-related stress among nurses in different countries (Büssing and Glasser, 1999), and the findings of such studies must be interpreted from the perspective of the

socio-cultural surroundings in which they are conducted. In the following paragraph we will give a brief description of the social position of the Icelandic nursing profession.

Iceland has a mostly homogeneous, Nordic population, a high standard of living, good education, and little unemployment. The total population is 283 000, and over half the population lives in the capital Reykjavik. The health service is primarily publicly financed and all citizens have national health insurance. Hence, most registered nurses are employed by the state. The health sector is regulated according to the Health Service Act of 1990, under which all inhabitants have access to the best possible health service. In Iceland, most of the health service is divided in two major components: primary healthcare centres and hospitals. The primary healthcare centres are responsible for general health examination, community care, and home nursing as well as preventive measures, such as family planning, maternity care and child health care and school health care. Operations and procedures in all specialist medical fields are mostly performed at hospitals and are free of charge. Apart from working at hospitals and community health care centres, nurses employed by the state work in institutions for the elderly and rehabilitation centres (Icelandic Ministry of Health and Social Security, 2003).

Registered nurses have formal authority and responsibility comparable to that of medical doctors within institutions. According to Icelandic law, registered nurses are in charge of nursing, and medical doctors are in charge of medicine. All hospitals and the larger healthcare centres are directed by an executive board, comprising the managing director, the nurse director and the medical director. In hospitals with sectoral divisions, there is also a manager of nursing and manager of medicine for each sector (e.g., paediatrics, obstetrics and gynaecology, etc.). The legal responsibility and authority of the nurse director and the medical director are comparable.

The official titles for nurses are restricted to staff nurse, head nurse, and nurse director. Full-time nurses are contracted to work 40 hours a week. In comparison with nurses in the other Nordic countries, the patient load is higher for Icelandic nurses. According to the Health Statistics in the Nordic Countries in 2002 (Nordic Medico Statistical Committee, 2004), the number of active nurses per 100 000 inhabitants calculated as full-time equivalents is 600 in Iceland, 967 in Denmark, 939 in Sweden, 984 in Norway, 1410 in Finland and 785 in the Faroe Islands. Since 1987 all nurses have completed a four-year university education, receiving a BS degree in nursing upon completion of their studies. Approximately 8% of working, registered nurses have completed a master's degree, and about 0.6% a PhD.

Method

Design

The study used a cross-sectional survey design in which data were gathered with a mailed questionnaire. A reminder was sent out four weeks later and three months thereafter, the questionnaires were remailed to those who had not answered. Permission to carry out the study was granted by the Icelandic Data Protection Committee and the Institutional Review Board at the University Hospital.

Sample

The population in this study was composed of all working nurses registered at the Icelandic Nurses' Association (INA) at the time of the study or a total of 2234 nurses. Approximately 95% of the nursing workforce in Iceland are members of the INA. Of the 2234 nurses, 522 (23.4%) were randomly selected to participate in the study. The response rate was 42% (N = 219), representing 9.8% of the population. In order to validate the representativeness of the sample, the participants' age, education and sex was compared with the total population, i.e., all working nurses registered with the INA. These were

variables assessable through the register of the INA. The mean age of the sample was 42.5 years vs. that of the population 42.8 years ($\chi^2 = 2.52$, $df = 7$, $0.96 > p < 0.20$). Almost half (45.7%) of the sample had a BS degree, compared with 43.9% of the population ($\chi^2 = 0.28$, $df = 2$, $p = 0.602$). Three of the participants (1.4%) were male nurses, compared with 1.1% ($n = 25$) of the population. Hence, the sample is representative of the population, i.e. working Icelandic nurses with respect to age, sex, and education. Because of the small number of male nurses, analysis based on gender was impossible.

The participants were divided into two comparative groups, (1) nurses working in hospital settings and (2) nurses working outside hospital settings. Nine nurses (4%) chose not to give information about their workplace and were excluded from the comparative analysis. Of the remaining 206 nurses, 72 (35%) worked outside the hospital setting, and 138 (65%) were hospital-based. Eighty-one nurses worked at a hospital with 300 or more beds, 29 at hospitals with 100-299 beds, and 28 at smaller hospitals. Of the participants not working in hospital settings, 32 worked at a nursing home, 19 at a primary health centre, eight at a rehabilitation centre and the remaining 13 at various institutions, private and public.

The Instrument

Data was gathered by a questionnaire designed to gather demographic information and measure indicators of working conditions, workload, job satisfaction, occupational health, support from colleagues, occupational stress and opportunities to practice different aspects of the professional role. The questionnaire is based on (a) an instrument developed and used by the Irish Nursing Association in order to measure stress, workload and working conditions (Wynne et al., 1993); (b) the *Job Descriptive Index (JDI)* (Smith, Kendall, and Hulin, 1969) and (c) the *Social Readjustment Rating Scale* (Gunderson and Rahe, 1979). These questionnaires were translated into Icelandic, adapted to the Icelandic

context and validated by a group of nurse specialists (Biering and Sveinsdóttir, 2001). In this paper data on demographics, occupational stress, job satisfaction, working conditions, support from colleagues and opportunities to practice different aspects of the professional role is presented. Data on work load and occupational health has been presented elsewhere (Sveinsdóttir and Biering, 2003)

Demographics

Information was gathered about the participants' age, gender, number of children, and education (diploma, BS, MS, PhD).

Occupational stress

The Source of Occupational Stress Scale (SOSS) (Wynne et al., 1993) was used to measure occupational stress. SOSS is a 28-item instrument measuring factors related to sources of general occupational stress in nursing by asking how frequently a certain factor causes stress at work. The possible responses are, *never* (1), *rarely* (2), *sometimes* (3), *frequently* (4), and *always* (5). Items on the scale are shown in Table 2. Using ANOVA with a multitude of ten or more dependent variables carries increased risk of inflated significance or higher risk of error of type I. of inflated significance a Bonferroni adjustment was made (Tabachnick and Fidell, 1983). Using this method the alpha level of each individual test is adjusted downwards based on the number of statistical tests performed. This is done by dividing the alpha level by the number of tests performed. With this method a level of significance level set at 0.0017 (.05/28) should detect against inflated significant level.

Job satisfaction

Job satisfaction was measured with an adopted version of the JDI that was originally designed by Smith, Kendall, and Hulin (1969). The instrument measures five indicators of nurses' job satisfaction: satisfaction with the work itself (16 questions);

satisfaction with the head nurses (18 questions); satisfaction with the nursing management (18 questions); satisfaction with co-workers (18 questions); satisfaction with the salary (8 questions); and satisfaction with opportunities for promotion (8 questions). The instrument was adopted by changing the rating scale from a three-point rating scale – (1) yes, (2) uncertain, (3) no - into a five-point Likert scale with ratings ranging from 1 to 5. The possible responses are: *completely agree* (1), *somewhat agree* (2), *uncertain* (3), *somewhat disagree* (4), and *completely disagree* (5). Lower scores indicate greater satisfaction. To get a score on a subscale participant needed to answer 80% or more of its questions. The same principle was used when calculating the total score on the instrument.

Working conditions

Items regarding working conditions came from Wynne et al. (1993). These items ask about the years of total work experience; years of work at current workplace; total working hours per week; direct patient care as measured in hours per day; number of nurses who have left the unit 12 months prior to the study; shortage of nurses at the unit as measured by the number of nurses needed to fill available positions at the time of the study; official working hours per week; hours of overtime per week; whether the participants worked back shifts (yes/no); whether they received annual vacation when they requested (yes/no); whether they were able to take meal breaks at the appointed time; shortage of staff at the unit (yes/no/don't know), and meal breaks off the unit (almost always/often/sometimes/seldom/never). Four items, asking whether the participant was requested to work on days off, experienced unscheduled shift changes, had to perform relief duties, or had to go off duty late due to work load, had high internal reliability (Chronbach's $\alpha = 0.80$). Therefore, they were combined into one variable labelled *Unscheduled work*. Possible responses to these questions were often/sometimes/seldom/never (see Table 4).

Support from co-workers

The participants were asked whether they got support from the following co-workers: other nurses, head nurses, nursing assistants (auxiliary nurses), physicians, nursing managers, hospital ministers (priests), social workers, and psychologist. The possible responses were: no support (1), little support (2), some support (3) or a lot of support (4) (Wynne et al., 1993).

Opportunities to practice different aspects of the professional role

The participants were asked to what extent their work provided them with opportunities to practice the following professional roles: *teaching, caring, teamwork, professional development, counselling, decision making, research, continuing education, mental support and the development of a specific nursing intervention*. The possible responses were not at all (1), to some extent (2), to a great extent (3,) and completely (4) The first five items came from Wynne et al. (1993) study but the other five were included based on the Icelandic context of the study. For the purpose of the regression analysis performed on total stress, these items were combined into one scale labelled *Opportunities to practice different aspects of the professional role*. The scale was tested for reliability and Crohnbach's α was found to be 0.84.

Data analyses

All calculations were done using SPSS 10.0. The data are presented as mean \pm standard deviation (SD). Differences between groups were calculated using an independent samples t-test or ANOVA for ordinal/continuous variables, and chi square test for categorical variables. Pearson's correlation coefficient r was used to show an correlation between mean score of stress and other ordinal/continuous variables.

Using statistical testing with a multitude of ten or more dependent variables carries increased risk of inflated significance or higher risk of error of type I. The ANOVA

comparisons used to detect differences in individual items of the SOSS between hospital based nurses and non-hospital based nurses (Table 2) are performed on 28 variables. In order to prevent inflated significance a Bonferroni adjustment was made (Tabachnick and Fidell, 1983). Using this method the alpha level of each individual test is adjusted downwards based on the number of statistical tests performed. This is done by dividing the alpha level by the number of tests performed. With this method a level of significance level set at 0.0017 (0.05/28) should detect against inflated significant level in the above mentioned comparisons.

A stepwise, multiple linear regression model was employed to calculate significant predictors of the mean score of stress. All questions, which correlated significantly or were associated with the mean stress score were used in the regression model. $P < 0.05$ was regarded as significant.

Findings

Socio-demographic characteristics

Table 1 displays the socio-demographic variables of nurses working at a hospital and outside the hospital setting. It is noteworthy that nurses working outside the hospital setting were older and had more children than nurses working in hospital settings. The mean age of the hospital nurses was 40.9 years, but the mean age of nurses not working at hospitals was 45.4 years ($p = 0.001$). The mean number of children living at home in the former group was 1.9, but in the latter group 2.5 ($p = 0.002$). Marital status, education and work position did not differ significantly between the two groups.

Occupational stress

The mean total score on the Source of Occupational Stress Scale (SOSS) scale was 2.26 for nurses working in the hospital setting and 2.21 for nurses working outside such setting. There was not a significant difference in the total score between the two groups ($t=0.748$; $df=206$; $p=0.455$). Table 2 displays the mean scores on individual items on the SOSS scale. The following situations had the highest mean scores for both groups of nurses: *having too much work to do, insufficient consultation and communication, inadequate feedback on performance, insufficient resources to work with and not being able to “switch off at home”*. Both groups scored highest on the item *having too much work to do*. The only difference found between the situations which the two groups found stressing was that hospital-based nurses reported significantly higher score on equipment.

Job satisfaction

The mean scores on the JDI and its subscales did not differ between the two groups (Table 3). The greatest satisfaction was reported with co-workers and head nurses, but the least satisfaction with salary and opportunities for promotion. Job satisfaction correlated moderately with occupational stress ($r = 0.41$; $\rho < 0.001$).

Working conditions

Nurses working in hospitals scored higher than nurses working outside hospital settings on variables indicating strenuous working conditions (Table 4). The hospital nurse worked on average 39.4 hours a week, while nurses outside hospital settings worked 36.3 hours ($\rho = 0.033$). On average, the hospital nurses provided more hours (5.0) of direct patient care, compared with 3.8 hours among nurses working outside hospital settings ($\rho = 0.003$). A higher proportion of hospital nurses reported shortage staff in general at the unit and scored higher on the *Unscheduled work* scale. Furthermore, a higher proportion of

nurses working in hospitals reported that they seldom had time for a lunch break, and that their lunch break was seldom taken outside their work unit.

More than half of (62.1%) of hospital based nurses and 36.4% of non hospital based nurses reported that two or more nurses were needed to fill positions at their workstation. Additionally hospital based nurses stated that on average more than 3 nurses had left their unit over the last twelve months and non- hospital based nurses said that 1.5 nurses had left their unit during the same period.

Opportunities to practice different aspects of the professional role

Table 5 displays to what extent nurses working in hospitals and outside the hospital settings could practice different aspects of their professional role. A great majority of nurses at both settings participated in teaching, caring and decision-making. Table 5 also demonstrates that a significantly higher proportion of nurses working at hospitals reported opportunities to participate in teamwork, provide caring services, and develop new nursing interventions. Furthermore, a higher proportion of nurses outside the hospital setting stated that they never had opportunities to participate in continuing education.

Support from co-workers

The participants receive the greatest support from staff nurses, head nurses, and licensed practical nurses (Table 6). A significantly higher ratio of hospital nurses reported support from staff nurses and hospital administrators, compared with nurses not working at hospitals, who, on the other hand, report significantly greater support from psychiatrists.

Factors predictive of occupational stress among nurses

The continuous variables used in this study were correlated with the total score on the SOSS, and the results are shown in Table 7. The relationship between categorical variables and total stress was assessed using ANOVA and t-tests. Workplace (hospital vs. not hospital) did not show significant differences ($t(206)=1.776$; n.s.). Education did not

have a significant relationship with stress ($F(2,99)=0.624;n.s.$). No differences were observed on stress by marital status ($t(212)=-1.312;n.s.$) or by work position ($F(2,201)=0.457;n.s.$). The significant variables shown in Table 7 were entered into a stepwise regression model in order to predict factors of occupational stress among nurses. The model predicts that more opportunities to practice professional aspects of work, less unscheduled work, greater satisfaction with head nurses, and longer total work experience in nursing are associated with less stress. The variables explained 19.1% of the variance of total stress (R^2 was 0.191).

Discussion

The findings of this first national study on occupational stress among Icelandic nurses suggest that in Iceland strenuous working conditions are felt more severely among hospital nurses than nurses working outside hospital settings. These strenuous working conditions are felt more severely among hospital nurses than nurses working outside hospital settings. Hospital nurses work more hours per week, provide more direct patient care, have less opportunity to take lunch breaks at the appointed time and off the unit, and at their workplaces there are greater staff shortages. Nurses working in hospitals have also tolerated more unforeseen changes in their work schedule. A report on women's health from the Icelandic Ministry of Health and Social Security (2003) concludes that in order for society to benefit from women's participation in the work force, society needs to recognize that women are still considered responsible for the household and the welfare of the family. Our findings indicate that there are a number of factors at nurses' workplaces that make them family-unfriendly, and that these factors are more prevalent at workplaces inside than outside hospital settings. In spite of these family-unfriendly working conditions, Icelandic nurses are willing to take on extra duties and work overtime, but nurses in hospitals worked on average 6 hours extra per week and nurses outside the

hospital 4.8 hours extra. One explanation of the long working hours of Icelandic nurses could be the general shortage of nurses in Iceland. In other words, healthcare institutions in Iceland would not function properly if nurses did not work overtime. According to a report prepared by the Icelandic Nurses' Association in cooperation with nurse directors, 425 nurses are needed to fill vacant nursing positions (Sigurdardóttir et al., 1999), which is an extremely high number given how small the Icelandic healthcare sector is (total number of working nurses 2234). The participants in our study confirm that there is a shortage of nursing personnel in the Icelandic healthcare sector, but 62% of hospital-based nurses, compared with 36% of non-hospital-based nurses, said that two or more nurses were needed to fill available positions at their workplace. This situation is consistent with the situation worldwide, which has been described as the global crisis of nursing (Booth, 2002; Heitlinger, 2003; Lambert et al., 2004). Furthermore, according to official statistics, the patient load per registered nurse is considerably higher in Iceland than in the other Nordic Countries (Nordic Medico Statistical Committee, 2004). It can therefore be assumed that in Iceland, nurses' working conditions are even more stressful than those in the countries that Iceland usually compares itself with, i.e. the other Nordic countries.

With the exception of the number of working hours per week, the demographics of the participants in the study did not differ from the population of Icelandic nurses. Therefore, we can conclude that the findings of the study describe the situation of Icelandic nurses working full time or almost full time in the healthcare sector. The study found that nurses working in hospitals are younger and have fewer children than those working outside hospitals. A possible explanation is that younger nurses are more tolerant than older nurses of the hospitals' strenuous working conditions.

Co-workers meeting nurses on a daily basis provide them with the greatest support, i.e. staff nurses and head nurses. That hospital nurses received significantly more support

from staff nurses than do nurses outside hospital settings can probably be explained by the fact that due to work organization nurses at the hospital generally spend more time with their close co-workers than nurses who are working in other settings like community healthcare centres. Work organization probably also explains why nurses working at hospitals receive almost no support from psychiatrists, and why a high proportion of nurses who are not hospital-based receive no support from hospital priests.

The Landspítali-University Hospital, where almost half of the Icelandic nursing workforce works (INA statistics), has a very ambitious vision of nursing that includes all the professional aspects of nursing probed for in this study. Therefore, it is surprising that a high percentage of nurses both working at hospitals and outside such setting report that to some extent they can just not at all practice the various aspects of the professional role of nursing (Table 5). It is noteworthy that a significantly lower proportion (17%) of hospital nurses than nurses working outside hospital settings (27%) did not, either at all or to some extent, have opportunity to practice caring. A part of the explanation might be a different mix of workplaces among nurses outside the hospital setting, for a small proportion of them does not work with patients. Another explanation could be a relatively high number of nurses in upper management positions among those who were not hospital-based.

Fewer nurses working in the hospital setting than those working outside the hospital setting said, respectively, that they could not at all engage in continuous education and develop nursing intervention. These findings are important, especially when it is taken into account that our findings suggest a heavier workload among hospital-based nurses, which might indicate that they would report fewer opportunities than nurses outside the hospital to practice this aspect of the professional role. No difference was found between the two groups on the total score of the scale *Opportunities to practice different aspects of the nursing role*. However, these opportunities explained 7.5% of the variance in total

stress. It has been recognized that characteristics of the work role like work ambiguity and role conflict are major work stressors (Kahn et al., 1964). In this study, the work role *per se* was not assessed; however, approximately 50% or more of both groups of nurses stated that they could not, either at all or to some extent, practice the professional role of nursing. This might indicate that nurses are experiencing a conflict between their expectations of the professional role and the reality of their work. The finding that too much work was found to produce the greatest stress also supports the existence of this conflict. Taken together, these findings might indicate a need to reorganize the content of nurses' work and give higher priority to the professional role of the nurse.

The regression analyses revealed that *Opportunities to practice the professional role of nursing, Unscheduled work, less work experience and less satisfaction with the head nurses* contributed significantly to the production of stress. These items are almost identical to the ones found to be the major source of general stress among Irish nurses (Wynne et al., 1993). The finding that greater satisfaction with head nurses lessened total stress supports the findings from a number of studies that have identified the importance of head nurses and their leadership style in reducing stress among their staff (Decker, 1997; Duxbury et al., 1984; Bakker et al., 2000, Stordeur et al., 2001). In a study on Japanese nurses Lambert et al. (2001) found that the less work experience the nurses had the more workload they experienced. Furthermore, the less experienced nurses felt they got less support from co-workers which is consistent with findings of a study at a urban university hospital in USA (Decker, 1997). In Lambert's study the nurses with less work experience were less likely to consider them adequately prepared and were more likely to be uncertain about treatment. A study, that used Grounded Theory methodology to study the transition of nurse student to staff nurse, casts some light on these findings (Charnley, 1999). In that study participants described how they felt that some of their most anxiety provoking tasks

were to develop necessary skills to make clinical judgement and to develop professional relationships with co-workers.

The findings that 'opportunities to practice the professional role of nursing' and 'unscheduled work' contributed significantly to the production of stress is consistent with the findings of a study done on 43,000 nurses in USA, Canada, England, Scotland, and Germany (Aiken et al., 2001). This study found that in all of these countries, except Germany, minority of nurses perceived that they have opportunities for advancements. It also found that that less than half of the nurses in all the countries thought that management in their hospitals was responsive to their concerns. Also, these findings supports the suggestion that it is perhaps not the work assignments themselves, but how the work is organized that causes the greatest occupational stress. However the work assignment does influence occupational stress as reflected in the only significant difference found between the two groups, but hospital-based nurses found the use of equipment more stressful than the others reflecting the proximity of hospital nurses to equipments as compared to non hospital-based nurses. The regression analyses revealed that *Opportunities to practice the professional role of nursing* and *Unscheduled work* contributed significantly to the production of stress. These two factors are indicators of the organizational structure of the work. This finding is consistent with studies that have confirmed that organizational structure seems to be an important stressor in nursing (Wheeler & Riding, 1994; Blair & Littlewood, 1995), and that occupational stress arises from social arrangements that are partially determined by the organization of work (Cooper, 1998).

Heavy workload and a high level of occupational stress diminish nursing quality, and nurses experience difficulties in meeting patient needs (Bailit & Blanchard, 2004; Sochalski, 2004). However, it is not only organizational factors and work tasks that cause

occupational stress and a high turnover rate. The interaction between organizational factors and the characteristics of individual workers (Rutenfranz et al., 1981) also plays a significant role. Furthermore, it is important to keep in mind that the way nurses perceive the attributes of their work will influence objective measures of their occupational stress (Adams & Bond, 2000). This study found that nurses working outside the hospital setting were older and had more children than nurses working in hospitals. These factors might influence the way participants perceive the attributes of their work and hence how they evaluate sources of occupational stress. Therefore, it is important to study the relations between occupational stress and individual characteristics of Icelandic nurses further, and also how these characteristics might influence nurses' choice of workplace and specialty.

The findings of this study can help identify which sources of job-related workloads are specific to each of the two groups under study and thus guide preventive measures that nurse managers could take to diminish occupational stress in the workplace. For example, nurse managers in hospital settings could give nurses opportunities to enhance their technical skills so they feel safer in the high-tech environment and also provide them with the means to strengthen their communication skills, and managers outside hospital settings should seek ways to increase the diversity of the work assignments of each individual nurse.

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References

- Adams, A., Bond S., 2000. Hospital nurses' job satisfaction, individual and organizational characteristics. *Journal of Advanced Nursing* 32 (3), 536-543.
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J. A., Busse, R., Clarke, H., Giovannetti, P., Hunt, J., Rafferty, A. M., Shamian, J., 2001. Nurses' reports on hospital care in five countries. *Health Affairs* 20 (3), 43-53.
- Alexopoulos, E.C., Burdorf, A., Kalokerinou, A., 2003. Risk factors for musculoskeletal disorders among nursing personnel in Greek hospitals. *International Archives of Occupational and Environmental Health* 76 (4), 289-294.
- Bailit, J.L., Blanchard, M.H., 2004. The effect of house staff working hours on the quality of obstetric and gynecologic care. *Obstetrics & Gynecology* 103 (4), 613-616.
- Bakker, A.B., Killmer, C.H., Siegrist, J., Schaufeli, W.B., 2000. Effort-reward imbalance and burnout among nurses. *Journal of Advanced Nursing* 31 (4), 884-891.
- Biering, P., Sveinsdóttir, H., 2001. Könnun á vinnuálagi og starfsánægju íslenskra hjúkrunarfræðinga – streita og álag [National Survey on occupational stress and job satisfaction among Icelandic nurses]. *Tímarit FÍH [The Icelandic Journal of Nursing]*, 77 (5), 321-327.
- Blair, A., Littlewood, M. 1995. Sources of stress. *Journal of Community Nursing*, 40, 38-39.
- Blegen, M.A., 1993. Nurses' job satisfaction: a meta-analysis of related variables. *Nursing Research* 42 (1), 36-41.
- Booth, R., 2002. The nursing shortage: a worldwide problem. *Review of Latin America Enfermage* 10 (3), 392-400.

- Büssing, A., Glasser, A., 1999. Work stressors in nursing in course of redesign: implications for burnout and interactional stress. *European Journal of Work and Organizational Psychology* 8 (3), 401-426.
- Charnley, E., 1999. Occupational stress in the newly qualified staff nurse. *Nursing Standards* 13 (29), 33-36.
- Cooper, C.L., 1998. Introduction. In: Cooper, C.L. (Ed.), *Theories of Organizational Stress*. Oxford University Press, Oxford, pp. 1-5.
- Decker, G. F., 1997. Occupational and non occupational factors in job satisfaction and psychological distress among nurses. *Research in Nursing and Health* 20, 523-528.
- Duxbury, M.L., Armstrong, G.D., Drew, D.J., Henly, S.J., 1984. Head nurse leadership style with staff nurse burnout and job satisfaction in neonatal intensive units. *Nursing Research* 33 (2), 97-101.
- Elfering, A., Grebner, S., Semmer, N.K., Gerber, H., 2002. Time control, catecholamines, and back pain among young nurses. *Scandinavian Journal of Working and Environmental Health* 28 (6), 386-393.
- Gray, P., 2000. *Mental health in the workplace: tackling the effects of stress*. Mental Health Foundation, London.
- Gunderson, E., Rahe, R. H., (1979). *Life Stress and Illness*. Illinois: Thomas.
- Hegney, D., Plank, A., Parker, V., 2003. Nursing workloads: the results of a study of Queensland nurses. *Journal of Nursing Management* 11 (5), 307-314.
- Heitlinger, A., 2003. The paradoxical impact of health care restructuring in Canada on nursing as a profession. *International Journal of Health Services* 33 (1), 37-54.
- Jakob, S.M., Rothen, H.U., 1997. Intensive care 1980-1995: change in patient characteristics, nursing workload and outcome. *Intensive Care Medicine* 23 (11), 1165-1170.

- Kahn, R. L., Wolfe, D.M., Quinn, R.P., Suduck, J., Snoek, J.S., Rosenthal, R.A., 1964. Organizational Stress: Studies in Role Conflict and Ambiguity. John Wiley and Sons, New York.
- Lambert, V.A., Lambert, C.E., Ito, M., 2004. Workplace stressors, ways of coping and demographic characteristics as predictors of physical and mental health of Japanese hospital nurses. *International Journal of Nursing Studies* 41 (1), 85-97.
- Lavanco, G., 1997. Burnout syndrome and type A behavior in nurses and teachers in Sicily. *Psychological Reports* 81 (2), 523-528.
- Lee, I., Wang, H.H., 2002. Perceived occupational stress and related factors in community nurses. *Journal of Nursing Research* 10 (4), 253-260.
- Marshall, J., 1980. Stress among nurses. In: Copper, C.L., Marshall. J. (Eds.), *White Collar and Professional Stress*. Chichester, England, John Wiley, pp. 19-57.
- Makinen, A., Kivimaki, M., Elovainio, M., Virtanen, M., 2003. Organization of nursing care and stressful work characteristics. *Journal of Advanced Nursing* 43(2),197-205.
- McGowan, B., 2001. Self-reported stress and its effects on nurses. *Nursing Standard* 15 (42), 33-38.
- Nordic Medico Statistical Committee, 2004. *Health Statistics in the Nordic Countries 2002*. Nordic Medico Statistical Committee, Copenhagen.
- Icelandic Ministry of Health and Social Security, 2003. Internet (retrieved 07.11.2004): <http://www.raduneyti.is>
- Payne, N., 2001. Occupational stressors and coping as determinants of burnout in female hospice nurses. *Journal of Advanced Nursing* 33 (3), 396-405.
- Rutenfranz, J., Knauth, P. & Angersbach, D. 1981. Shiftwork research issues. In: Johnson, L., Tepas, D., Colquhoun, W.P., & Colligan, M. (Eds.). *Advances in Sleep Research Vol. 7: Biological Rhythms, Sleep and Shiftwork*. MTP Press, Lancater.

- Santos, S.R., Carroll, C.A., Cox, K.S., Teasley, S.L., Simon, S.D., Bainbridge, L.,
Cunningham M., Ott, L., 2003. Baby boomer nurses bearing the burden of care: a
four-site study of stress, strain, and coping for inpatient registered nurses. *Journal of
Nursing Administration* 33 (4), 243-250.
- Schmitz, N., Neumann, W., Oppermann R. 2000. Stress, burnout and locus of control in
German nurses. *International Journal of Nursing Studies* 37(2), 95-99.
- Shader, K., Broome, M.E., Broome, C.D., West, M.E., Nash, M., 2001. Factors influencing
satisfaction and anticipated turnover for nurses in an academic medical center.
Journal of Nursing Administration 31 (4), 210-216.
- Sigurdardóttir, S., Finnbogadóttir, A., Möller, A., Einarsdóttir, E., Ingadóttir, E.,
Sigurdardóttir, G., Sveinbjörnsdóttir, I., Sigurdardóttir, R., Ákadóttir, Th., (1999).
Mannekla í hjúkrun [Shortages of Nurses]. A report on shortages of nurses prepared
by the Icelandic Nurses' Association. The Icelandic Nurses' Association, Reykjavik.
- Siu, O.L., 2002. Predictors of job satisfaction and absenteeism in two samples of Hong
Kong nurses. *Journal of Advanced Nursing* 40 (2), 218-229.
- Smith, P.L., Kendall, L., Hulin, C. (1969). *The Measurement of Satisfaction in Work and
Environment*. Chicago: Rand McNally.
- Snelgrove, S.R., 1998. Occupational stress and job satisfaction: a comparative study of
health visitors, district nurses, and community psychiatric nurses. *Journal of Nursing
Management* 6 (2), 97-104.
- Sochalski, J., 2004. Is more better?: the relationship between nurse staffing and the quality
of nursing care in hospitals. *Medical Care*, 42, (2 Suppl), II 67-73.
- Stordeur, S., D'hoore, W., Vandenberghe, C., 2001. Leadership, organizational stress, and
emotional exhaustion among hospital nursing staff. *Journal of Advanced Nursing* 35
(4), 533-542.

- Sveinsdóttir, H., Biering, P., 2003. Vinnuálag og starfsánægja hjúkrunarfræðinga [Nurses' occupational stress and job satisfaction]. In: Sveinsdóttir, H., Nyysti, A. (Eds.), Framtíðarsýn innan heilsugæslunnar [The Future of Community Health Nursing]. The University of Iceland Press, Reykjavik, pp. 202-215.
- Tabachnick, B.G., Fidell, L.S. (1983). *Using Multivariate Statistics*. New York: Harper & Row, p. 254.
- Tarnow-Mordi, W.O., Hau, C., Warden, A., Shearer, A.J., 2000. Hospital mortality in relation to staff workload: a 4-year study in an adult intensive-care unit. *Lancet* 356 (9225), 185-189.
- Tummers, G.E., Janssen, P.P., Landeweerd, A., Houkes, I. 2001. A comparative study of work characteristics and reactions between general and mental health nurses: a multi-sample analysis. *Journal of Advanced Nursing* 36 (1), 151-162.
- Wheeler, H.H., Riding, R., 1994. Occupational stress in general nurses and midwives. *British Journal of Nursing* 3 (10), 527-534.
- World Health Organization, International Council of Nurses, Royal College of Nursing U.K., 2003. International Nurse Mobility: Trends and Policy Implications. Internet (retrieved 07.11.2004): http://www.icn.ch/PR22_03.htm
- Wynne, R., Clarkin, N., McNieve, A., 1993. The experience of stress amongst Irish nurses – main report. Work Research Centre, Dublin.

Table 1. Difference between nurses working in the hospital setting and outside the hospital setting by demographic variables

	Hospital-based nurses M±SD	Not hospital-based nurses M±SD	t.	df.	P
Age (years)	40.9 ± 9.2	45.4 ± 9.16	-3.539	206	0.000
No. of children	1.9 ± 1.2	2.5 ± 1.2	-3.284	204	0.001
	%	%	χ^2	df.	p.
Education			3.635	2	0.162
Nursing diploma	45.0	56.9			
B. Sc.	51.2	36.9			
M.Sc. or PhD	3.9	6.2			
Marital status			2.573	1	0.075
Married/cohabitation	76.5	85.9			
Unmarried, divorced	23.5	14.1			
Work position			7.530	3	0.057
Basic	54.9	45.3			
Assistant head nurse	16.5	12.5			
Head nurse	20.3	20.3			
Other (upper management, teachers, project leaders)	8.3	21.9			

Table 2. Mean scores on individual items on the Source of Occupational Stress Scale by nurses working in the hospital setting and outside the hospital setting.

Items	Hospital-based nurses			Not hospital-based nurses			t.	df.	p.
	N	Mean	SD	N	Mean	SD			
Home life with a partner who is also pursuing a career	122	1.61	0.84	60	1.58	0.77	0.181	180	0.857
Insufficient resources to work with	132	2.87	1.06	68	2.5	1.07	2.339	198	0.02
Having too little work to do	127	1.60	0.82	62	1.44	0.76	1.248	187	0.213
Lack of career prospects	128	2.34	1.02	60	2.18	1.03	1.004	186	0.317
Rules and regulations	126	2.07	0.77	63	1.90	0.84	1.361	187	0.175
Being undervalued	132	2.41	0.9	67	2.42	1.06	-0.061	197	0.951
Inadequate feedback on performance	128	2.63	0.93	62	2.68	1.02	-0.3	188	0.764
Relationships with supervisor	130	2.1	0.83	67	2.13	0.97	-0.258	195	0.796
Monotonous/repetitive work	129	1.75	0.8	64	2.12	1.09	-2.69	191	0.008
Too much or too little variety in work	129	1.99	0.81	64	2.33	1.01	-2.503	191	0.013
Relationships with patients	129	2.06	0.78	63	1.98	0.66	0.885	190	0.377
Relationships with family and visitors	127	2.13	0.77	62	1.89	0.73	2.106	187	0.037
Relationships with co-workers	132	2.12	0.72	67	2.12	0.77	0.016	197	0.987
Managing or supervising others	131	2.31	0.91	64	2.28	0.9	0.174	193	0.862
Controlling changes at work	128	2.5	0.96	65	2.28	0.99	1.505	191	0.134
Insufficient consultation and communication	131	2.79	0.76	65	2.77	0.96	0.195	194	0.846
Morale and organisational climate	128	2.39	0.87	64	2.63	1	-1.671	190	0.096
Unclear responsibilities	127	2.06	0.85	61	2.05	0.86	0.045	186	0.964
Resistance to change	124	2.20	0.89	63	2.05	0.92	1.102	185	0.272
Inadequate or poor quality of training	129	1.95	0.79	62	2.03	0.79	-0.646	189	0.519
Implications of mistakes made	124	1.98	0.67	65	1.95	0.82	0.27	187	0.788
Lack of security at workplace	126	2.02	0.9	65	1.82	0.95	1.428	189	0.155
Having too much work to do	134	3.18	0.88	70	3.16	0.83	0.172	202	0.863
Equipment	130	2.14	0.89	64	1.67	0.8	3.5832	192	0.000
Not being able to "switch off" at home	132	2.57	0.94	68	2.68	1.09	-0.73	198	0.466
Ethical issues	129	2.35	0.79	63	2.30	0.85	0.38	190	0.705
Frequent changes in work schedule	126	2	1	56	1.64	0.92	2.269	180	0.024
Factors I can not control	124	2.45	0.9	60	2.4	0.96	0.359	182	0.721

Note: Bonferroni adjustment was made in order to detect significance level that does not increase the possibility of making a type 1 error. The correct level of significance is $p=0.0017$.

Table 3. Mean scores on the Job Satisfaction Index and Subscales by Nurses working in the hospital setting and outside the hospital setting.

Job satisfaction scales	Hospital-based nurses		Not hospital-based nurses		t	df.	p.	Chronbachs α
	N	M \pm SD	N	M \pm SD				
The job (16 questions)	132	2.07 \pm 0.47	66	2.22 \pm 0.57	-1.897	196	0.059	0.87
Head Nurse (18 questions)	112	2.07 \pm 0.64	49	2.05 \pm 0.59	0.155	159	0.877	0.96
Nurse directors (18 questions)	129	2.62 \pm 0.80	58	2.32 \pm 0.78	2.419	185	0.017	0.96
Salary (8 questions)	128	3.68 \pm 0.73	64	3.26 \pm 1.05	3.206	190	0.002	0.88
Promotion (8 questions)	125	3.53 \pm 0.66	57	3.55 \pm 0.80	-0.161	180	0.872	0.91
Co-workers (18 questions)	136	2.03 \pm 0.52	67	2.19 \pm 0.59	-1.929	201	0.055	0.92
Total score (86 questions)	127	2.46 \pm 0.36	58	2.43 \pm 0.50	0.476	183	0.635	0.96

Table 4. Working conditions of nurses working in the hospital setting (n=138) and outside the hospital setting (n=72).

Working conditions	Hospital-based nurses	Not hospital-based nurses	t.	df.	p.
	M±SD	M±SD			
Total working hours per week	39.4 ± 9.1	36.3 ± 10.0	2.151	192	0.033
Direct patient care (hours per day)	5.0 ± 2.4	3.8 ± 2.3	3.049	167	0.003
Unscheduled work	2.21 ± 0.68	2.94 ± 0.79	-6.990	208	0.000
Overtime per week	6.10 ± 5.48	4.82 ± 4.73	1.603	187	0.111
Years of total work experience	15.6 ± 9.9	19.5 ± 10.9	-2.576	206	0.011
Years of work at current workplace	5.9 ± 5.5	5.6 ± 5.7			0.690
	%	%	χ^2	df.	p.
Shortages of staff at the unit					
Yes	73.9	26.1	9.154	2	0.010
Official working hours per week					0.312
≤ 24 hours	8.7	14.9			
25 – 36 hours	49.3	50.7			
37 – 40 hours	42.0	34.3			
Nurses who take back-up shifts	25.2	21.7	0.355	1	0.339
Meal breaks at the appointed time					0.010
often or always	46.7	67.1			
sometimes	23.7	20.0			
seldom or never	29.6	12.9			
Meal break off the unit					0.006
often or always	14.0	32.4			
sometimes	16.9	9.9			
seldom or never	69.1	57.7			
Annual leave at a requested time	78.2	78.9	.004	1	0.551

Table 4. Working conditions of nurses working in the hospital setting (n=138) and outside the hospital setting (n=72).

Working conditions	Hospital-based nurses	Not hospital-based nurses	t.	df.	p.
	M±SD	M±SD			
Total working hours per week	39.4 ± 9.1	36.3 ± 10.0	2.151	192	0.033
Direct patient care (hours per day)	5.0 ± 2.4	3.8 ± 2.3	3.049	167	0.003
Unscheduled work	2.21 ± 0.68	2.94 ± 0.79	-6.990	208	0.000
Number of nurses who have left the unit over the last 12 months	3.11 ± 2.62	1.34 ± 1.44	4.900	178	0.000
Overtime per week	6.10 ± 5.48	4.82 ± 4.73	1.603	187	0.111
Years of total work experience	15.6 ± 9.9	19.5 ± 10.9	-2.576	206	0.011
Years of work at current workplace	5.9 ± 5.5	5.6 ± 5.7			0.690

	%	%	χ^2	df.	p.
Shortages of nurses at the unit					
0-1 nurse needed to fill positions	37.9	63.6			0.002
>= 2 nurses needed to fill positions	62.1	36.4			
Shortages of staff at the unit					
Yes	73.9	26.1	9.154	2	0.010
Official working hours per week					
≤ 24 hours	8.7	14.9			0.312
25 – 36 hours	49.3	50.7			
37 – 40 hours	42.0	34.3			
Nurses who take back-up shifts	25.2	21.7	0.355	1	0.339
Meal breaks at the appointed time					
often or always	46.7	67.1			0.010
sometimes	23.7	20.0			
seldom or never	29.6	12.9			
Meal break off the unit					
often or always	14.0	32.4			0.006
sometimes	16.9	9.9			
seldom or never	69.1	57.7			
Annual leave at a requested time	78.2	78.9	.004	1	0.551

Table 5. Opportunities for nurses working in the hospital setting and outside the hospital setting to practice different aspects of the professional role by groups.

Professional aspects of the work	Not at all %	To some extent %	To a great extent %	Completely %	χ^2
Teaching					7.385
Hospital-based (n=133)	2	25	63	10	
Not hospital-based (n=67)	2	37	43	18	
Caring					10.497*
Hospital-based (n=133)	2	15	52	32	
Not hospital-based (n=62)	11	16	52	21	
Team work					10.707*
Hospital-based (n=130)	6	42	42	11	
Not hospital-based (n=60)	20	45	25	10	
Professional development					1.865
Hospital-based (n=132)	6	43	44	7	
Not hospital-based (n=63)	10	46	41	3	
Counselling					4.512
Hospital-based (n=133)	5	40	52	4	
Not hospital-based (n=64)	6	33	50	11	
Decision making					0.947
Hospital-based (n=132)	2	21	62	15	
Not hospital-based (n=62)	2	26	55	18	
Research					7.746
Hospital-based (n=129)	44	43	12	1	
Not hospital-based (n=62)	53	32	8	7	
Continuous education					10.299*
Hospital-based (n=130)	5	58	34	4	
Not hospital-based (n=61)	18	43	34	5	
Mental support					7.028
Hospital-based (n=132)	7	44	41	8	
Not hospital-based (n=64)	16	34	34	16	
Develop. nurs. intervention					10.775*
Hospital-based (n=130)	12	48	36	5	
Not hospital-based (n=62)	29	47	21	3	

*Significant at $p < 0.05$, Chi-square, $df=3$

Table 6. Support received from co-workers by nurses working in the hospital setting and outside the hospital setting

Support received from	No support	Little support	Some support	Great support	x
	%	%	%	%	
Staff nurses					12,115*
Hospital-based (n=128)	2	5	52	42	
Not hospital-based (n=58)	5	17	52	26	
Head nurses					0,911
Hospital-based (n=107)	4	16	49	32	
Not hospital-based (n=41)	5	20	51	24	
Nurse directors					5,164
Hospital-based (n=127)	32	32	23	13	
Not hospital-based (n=53)	23	25	30	23	
Licensed practical nurses					4,850
Hospital-based (n=120)	10	23	53	14	
Not hospital-based (n=48)	23	19	46	13	
Physicians					1,070
Hospital-based (n=126)	13	33	48	6	
Not hospital-based (n=54)	15	32	44	9	
Psychiatrist					11,061**
Hospital-based (n=114)	91	6	2	1	
Not hospital-based (n=42)	76	10	14	-	
Social workers					1,625
Hospital-based (n=116)	74	13	12	1	
Not hospital-based (n=44)	79	7	14	-	
Priest					9,021**
Hospital-based (n=117)	53	20	22	5	
Not hospital-based (n=44)	77	14	9	-	

*Significant at $p.<0.01$, ** Significant at $p.<0.05$. Chi-square, $df=3$

Table 7. Correlations* between demographics, working conditions, support from co-workers, JDI, opportunities to practice the professional role and stress

	Total stress		
	Pearson's r	p.	N
Opport. to practice diff. aspects of the prof. role	-0.285	0	192
Demographics			
Age	-0.138	0.042	215
Number of children	0.011	0.878	214
Working conditions			
Total working hours per week	0.081	0.251	201
Direct patient care (hours per week)	0.148	0.052	172
Unscheduled work	0.243	0	217
Overtime per week	0.08	0.266	195
Years of total work experience	-0.14	0.041	214
Years of work at current workplace	-0.033	0.625	214
Official working hours per week	0.09	0.19	212
Meal breaks at appointed time	0.123	0.072	213
Meal break off the unit	0.128	0.062	214
Annual leave at requested time	0.116	0.095	209
Job satisfaction			
The job	0.213	0.002	206
Satisfaction with head nurse	0.279	0	164
Satisfaction with nurse directors	0.26	0	193
Satisfaction with salary	0.076	0.283	200
Satisfaction with career opportunities	0.103	0.156	190
Satisfaction with co-workers	0.185	0.007	211
Support from co-workers			
Support from staff nurses	0.005	0.948	194
Support from head nurses	-0.174	0.031	154
Support from nurse directors	-0.159	0.029	187
Support from LPNs	0.037	0.623	175
Support from physicians	-0.103	0.157	188
Support from psychologists	-0.023	0.765	161
Support from social workers	0.003	0.969	167
Support from priests	0.037	0.63	168

Table 8. Prediction of frequency of perceived stress by working conditions

	Non-standardized Coefficients		Standardized Coefficients				
	B	Std. Error	Beta	t	Sig.	R ²	R ² change
(Constant)	2.116	0.347		6.097	0		
Opport. to practice diff. aspects of the prof. role	-0.027	0.009	-0.243	-2.980	0.003	0.750	-
Unscheduled work	-0.147	0.050	0.226	2.914	0.004	0.134	0.059
Satisfaction with head nurses	0.194	0.067	0.233	2.875	0.005	0.170	0.036
Years of work experience	-0.008	0.004	-0.170	-2.142	0.034	0.191	0.021