

## ORIGINAL ARTICLE

# Predictors of leaving nursing care: a longitudinal study among Swedish nursing personnel

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**Objectives:** Despite extensive research on turnover among nursing personnel very little is known about the impact of physical workload and health on leaving. The aim of this study was to find predictors for leaving nursing care with special reference to physical working conditions and musculoskeletal problems.

**Methods:** This study is based on longitudinal data from a survey of nursing personnel who were employed at various county hospitals in Sweden from 1992–95. A self administered follow up questionnaire was used to identify their present position in the labour market. The response rate was 73% (n = 1095).

**Results:** The results showed that nursing personnel reporting musculoskeletal problems of the neck/shoulder or knees and those who had limited use of transfer devices were more likely to leave nursing care.

**Conclusions:** The study highlights the importance of taking musculoskeletal problems and use of transfer devices into consideration in order to retain nursing personnel.

Lack of nursing personnel is a serious problem in several countries and will continue to be so because of the aging nursing workforce and a decline in the number of young people entering the profession.<sup>1</sup> In order to develop recruitment strategies and to prevent nursing personnel from leaving their jobs, the importance of investigating reasons for leaving nursing care has been emphasised.<sup>2</sup>

Extensive research on turnover among nursing personnel exists, but there are few consistent results on the causes underlying the turnover. Large numbers of the studies conducted are cross sectional, based on small study samples, and have mainly focused on the relation between intentions to leave or stay and job attitudes, such as job satisfaction.<sup>3</sup> Although a relation between intention to leave and actual turnover has been reported, the strength of association differs across studies.<sup>4</sup> Factors that have been proved to predict turnover intentions or turnover include low job satisfaction, work related distress and role conflicts, lack of career prospects, poor salary, managerial environment, employment conditions, as well as individual characteristics such as being young and having short job tenure.<sup>5–11</sup>

Nursing is recognised as a physically demanding work, and prevalence of musculoskeletal problems has been found to be high among nurses.<sup>12</sup> Despite this, very little research has been done into the impact of physical work conditions and health on turnover, but a previous study indicates that back pain can contribute to the decision to leave nursing care.<sup>13</sup> An increasing number of people employed in nursing jobs in Sweden are on long term sick leave, which in the end may result in a definite exit from nursing and/or the labour market as a whole. Thus, health problems need to be taken into consideration in the study of turnover.

The aim of this study was to find predictors for leaving nursing care with special reference to physical work conditions and musculoskeletal problems. Nursing care is defined here as a job involving direct patient care in health institutions.

## METHODS

### Study population and data collection

This cohort study includes nursing personnel from two research projects carried out in Sweden during the period 1992–95. The first project was an intervention study

conducted at a county hospital in northern Sweden.<sup>14</sup> Nursing personnel working in various departments at the hospital participated in an education and training programme consisting of short courses in patient transfer technique, physical fitness exercise, and stress management. The overall aim of the intervention study was to decrease musculoskeletal symptoms and to enhance job satisfaction. A total of 754 people participated in the programme and completed a questionnaire on four different occasions. The other project was an epidemiological study aiming at identifying risk factors for work related back injuries among nursing personnel.<sup>15</sup> The study base consisted of nursing personnel employed in the county hospitals of Stockholm during the period 1992–94. The project had the design of a case referent study and included 266 cases and 691 referents.

The source population of the present study consisted of the participants from the above mentioned research projects—that is, a sample of 1711 subjects. Subjects aged 65 and older at follow up (n = 135) were not included in the study. Moreover, 18 subjects had died.

### Predictors (measured at baseline)

Baseline data constitute the data collected from the participants during the period 1992–95, and include information on physical working conditions, musculoskeletal symptoms, events leading to injury, and sociodemographic characteristics and employment conditions.

### Physical working conditions

Physical exertion during work was assessed using a modified Rating of Perceived Exertion (RPE) scale.<sup>16</sup> The question “How physically exerting did you in general perceive your work to be last week?” was responded to on a scale ranging from 0–14, where 0 = resting and 14 = maximal exertion. The variable was dichotomised into low and high physical exertion, where high physical exertion was defined as an RPE rating higher than 8, corresponding to between “somewhat hard” and “hard”.

Other physical working conditions were investigated with questions regarding number of patient transfers during a working shift (<11/≥11), heavy patient transfer on one's own (often/never, rarely), and use of transfer devices (often/never, rarely).

**Table 1** Characteristics at baseline of the respondents employed in a county hospital in Northern Sweden (cohort 1) and in county hospitals in Stockholm (cohort 2) (n = 1095)

	Cohort 1 (n = 507), n (%)	Cohort 2 (n = 588), n (%)	Total (n = 1095), n (%)
Sex			
Women	488 (96)	532 (90)	1020 (93)
Men	19 (4)	56 (10)	75 (7)
Age			
<30 years	112 (22)	231 (39)	343 (31)
≥30 years	395 (78)	357 (61)	752 (69)
Years in patient oriented job*			
<11	175 (35)	309 (53)	484 (44)
≥11	329 (65)	279 (47)	608 (56)
Nursing education			
Registered nurse	217 (43)	223 (38)	440 (40)
Assistant nurse	290 (57)	365 (62)	655 (60)

\*Information missing for three respondents.

### Musculoskeletal symptoms and events leading to injury

Musculoskeletal symptoms were assessed using the Nordic questionnaire.<sup>17</sup> The subjects responded yes or no to whether they had experienced any problems in their neck/shoulders, elbows, hands, back, hips, knees, and feet respectively during the last week. Events leading to injury in any of the above mentioned body regions during the last 12 months were also investigated using dichotomised responses (yes/no).

### Sociodemographic characteristics and employment conditions

Variables of sociodemographic characteristics and employment conditions included sex, age (<30 years/≥30 years), number of years in nursing care (<11 years/≥11 years), education (registered nurse/assistant nurse), employment in Stockholm (capital) or Sundsvall (middle sized town) and part or full time job (<35 hours/≥35 hours/week).

### Identification of cases

Available civic registration numbers were used to obtain addresses of the participants from the address register of the

Swedish population (SPAR). Fifty one people could not be identified in the address register due to missing or erroneous civic registration numbers. Finally, a questionnaire was sent to 1507 people in January 2003. During a period of 10 weeks three reminders were given when needed, one of which was by telephone. The response rate was 73% (n = 1095).

In the follow up questionnaire all the respondents answered one question about their present position in the labour market with the following alternatives: employed within nursing care, employed outside nursing care, on sick leave (part or full time), early retirement, unemployed, and other. In addition, an open ended question about their present job ("What kind of job do you have today?") was used to check the accuracy of the first question. Based on these responses, nursing personnel who reported that they were not employed in nursing care at follow up were defined as cases.

### Statistical analyses

In the analyses, each variable was dichotomised (exposed or non-exposed). Leaving nursing care was first analysed in relation to each variable separately. Odds ratios with 95%

**Table 2** Bivariate and multivariate logistic regression analyses of factors associated with leaving nursing care (n = 1095)

Variables	Number of exposed	Exposed cases	Crude OR (95% CI)	Adjusted OR (95% CI)
Male	75	33	2.4 (1.5-3.8)	2.1 (1.2-3.6)
Young age (<30 years)	343	107	1.4 (1.1-1.9)	1.2 (0.8-1.6)
Fewer years in nursing care (<11 years)	484	158	1.8 (1.4-2.4)	1.5 (1.1-2.0)
Assistant nurse	655	195	1.6 (1.2-2.1)	1.5 (1.1-2.1)
Employed in Stockholm	588	173	1.4 (1.1-1.9)	1.1 (0.8-1.7)
Working hours <35 hours/week	465	122	1.0 (0.7-1.3)	
Perceived physical exertion at work (RPE>8)	438	123	1.2 (0.9-1.6)	
Large number of patient transfers during a working shift (≥11)	264	79	1.3 (0.9-1.7)	
Heavy patient transfer on one's own	199	68	1.6 (1.2-2.3)	1.2 (0.9-1.7)
Limited use of transfer devices	483	146	1.4 (1.1-1.9)	1.5 (1.1-2.0)
Musculoskeletal symptoms in				
Any body region	863	226	1.0 (0.7-1.4)	
Neck/shoulders	351	150	1.3 (1.0-1.5)	1.5 (1.1-2.0)
Elbows	73	15	0.7 (0.4-1.3)	
Hands	176	48	1.1 (0.7-1.5)	
Upper back	233	69	1.3 (0.9-1.7)	
Lower back	551	147	1.1 (0.8-1.4)	
Hips	159	35	0.8 (0.5-1.2)	
Knees	213	67	1.4 (1.1-1.9)	1.5 (1.1-2.2)
Ankles/feet	151	48	1.4 (1.0-2.0)	
Accidents leading to injury during last 12 months	259	70	1.1 (0.8-1.5)	

RPE, Rating of Perceived Exertion.

confidence intervals were computed for the bivariate analyses. The set of variables that proved statistically significant at  $p$  values less than 0.1 in the bivariate analyses was further studied in a multivariate model using logistic regression. Model fit was assessed using the Hosmer-Lemeshow goodness of fit  $\chi^2$  statistics.<sup>18</sup> The results are presented as odds ratios for leaving with 95% confidence intervals.

In order to test for multicollinearity,<sup>18</sup> collinearity diagnostics such as correlations between the variables, tolerance and variance inflation factors, eigenvalues, and condition index were estimated for all the variables included in the logistic regression. No indication of multicollinearity was found for the variables included in the logistic model.

A dropout analysis was performed and comparisons were done using  $\chi^2$  tests for categorical variables and Student's  $t$  test for continuous variables.

### Ethical approval

Ethical approval was obtained from the Ethics Committee at Karolinska Institutet (reference number 02–198).

## RESULTS

### Characteristics of the respondents at baseline

The characteristics of the respondents at baseline are presented in table 1. Nursing education refers to the highest education in nursing reported by the respondent. In Sweden, registered nurses have at least three years of education whereas assistant nurses have two years or less. The latter includes both enrolled nurses and nurse's aides due to the similarities in work tasks and the small number of nurse's aides in the study sample.

### Predictors of leaving nursing care

In the study group, a total of 287 (26%) nurses were not employed in nursing care at follow up. Health variables that proved to be associated with leaving in the bivariate analyses were musculoskeletal problems of the neck/shoulder or knees. Physical working conditions, in terms of heavy patient transfer on one's own and limited use of transfer devices, were also related to a higher risk of leaving. The bivariate analyses further showed that being young, having fewer years in a nursing job, being male, being an assistant nurse, and being employed in Stockholm were all associated with leaving nursing care (table 2).

The variables that were associated with leaving nursing care in the bivariate analyses were included in the multivariate model (table 2). Nursing personnel reporting musculoskeletal problems of the neck/shoulder or knees were more likely to leave nursing care. Limited use of transfer devices was also associated with a higher risk of leaving, whereas heavy patient transfer on one's own did not prove to be statistically significant. Men had a higher probability of leaving as well as assistant nurses and personnel with fewer years in nursing care. The fit of the logistic model as assessed by the Hosmer-Lemeshow test was found to be satisfactory ( $p = 0.73$ ).

## DISCUSSION

### Results discussion

The results from the multivariate analysis showed that musculoskeletal problems of the neck/shoulder and knees were associated with leaving nursing care. Previous studies have shown that the physically demanding work of nursing personnel is associated with the development of musculoskeletal disorders,<sup>12–19</sup> which raises the question of the possible impact of physical workload on leaving. In our study, leaving nursing care was not associated with factors related to physical working conditions such as perceived

physical exertion at work and heavy patient transfers. However, personnel reporting limited use of transfer devices were more likely to leave, suggesting that physical workload may be of importance when leaving nursing care. It has been shown that performing regular patient transfers is a risk factor for occupational injuries,<sup>20</sup> which in turn may lead to permanent exit from nursing care. The use of transfer devices combined with training in how to use them has proved to decrease physical load as well as the risk of occupational injuries and musculoskeletal disorders in nursing care.<sup>15–21</sup> Limited use of transfer devices can be seen as an organisational factor, in that there might have been limited access to these devices at the wards and/or inadequate information to the personnel about how to use the devices. Thus, ergonomic interventions aimed at decreasing physical workload in nursing care can be one way to keep personnel in nursing care.

Our results revealed that being an assistant nurse was associated with leaving nursing care. In comparison with other healthcare workers they are more often exposed to physical workload, and the prevalence of musculoskeletal problems is high among assistant nurses.<sup>22–23</sup> Their working conditions have to a large extent been neglected by both policy makers and healthcare management during the reforms and downsizing that characterised the Swedish healthcare sector in the 1990s.

Another important finding in our study is the fact that male nursing personnel were more likely to leave nursing care. This draws attention to the gender divided labour market existing both in Sweden and other European countries, especially in the public sector, where the majority of employees are women, and its influence on the working climate for the "minority groups" and their propensity to quit. Perceived role strain and minority status has been reported by male nurses during their education and training,<sup>24</sup> and male students may face "negative sanctions" when they choose to go in for this occupation, which by tradition is a female one.<sup>25</sup> A study among Swedish male nurses showed that there are prejudiced opinions about men in nursing care, since the profession has by tradition a strong connection to conventional gender roles. In line with expectations of their surroundings, male nurses did further training to a larger extent than female nurses, and they also reached higher and more qualified positions.<sup>26</sup> It has further been shown that men advance at work, leaving behind any physically demanding work, whereas women remain in physically heavy work tasks—especially in health care.<sup>27</sup>

### Methodological considerations

A dropout analysis showed that relatively fewer assistant nurses versus registered nurses (67% *v* 77%,  $p = 0.000$ ), men versus women (63% *v* 71%,  $p = 0.04$ ), and personnel who had been working less than 11 years versus more than 11 years in nursing care (65% *v* 76%,  $p = 0.000$ ) responded to the follow up questionnaire ( $p < 0.001$ ). The mean age of the non-respondents was 44 years and for the respondents 47 years ( $p < 0.001$ ). In our study, these characteristics were related to an increased risk of leaving nursing care, and we may thus have underestimated the number of leavers.

Furthermore, the study cohort included nursing personnel ( $n = 266$ ) with back injuries from a case referent study, which might reduce the generalisability to the general nursing population. If there is a relation between back injury and leaving nursing care we may overestimate this association in the analysis. However, our results show no evidence of an increased risk of leaving nursing care due to injuries, and this bias should thus be limited.

The results from this study are not necessarily representative of all registered and assistant nurses in Sweden. The

source population consisted of nursing personnel representing different parts of Sweden—the capital and a smaller town in the middle of the country. In the decision to leave nursing, there might have been regional differences with regard to contributing factors outside the workplace, such as the labour market and work opportunities outside nursing. However, the multivariate analysis indicated no such effects.

Many factors contributing to leaving nursing are included in this study, but not factors that in other studies have been shown to play an important role in the decision to leave, such as salary, work organisation, and factors outside the work organisation—for example, the family situation, pregnancy, and childcare.<sup>9, 28–30</sup> In addition, public and private childcare in Sweden is more comprehensive compared to other European countries, making it possible for parents with young children to stay in the labour market, and as such cannot be regarded as a reason for leaving nursing care.

## CONCLUSION

The results showed that not only musculoskeletal problems of the neck/shoulder and knees were associated with leaving nursing care but also limited use of transfer devices, suggesting that physical workload may be of importance for negative health outcome. Thus, ergonomic interventions decreasing physical workload in nursing care can be one way to keep personnel in nursing care, and we argue that such interventions should focus on both the individual nurse and the organisation.

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