

Connection between nurse managers' stress from workload and overall job stress, job satisfaction and practice environment in central hospitals: A cross-sectional study.

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Abstract:	Nurse managers' workload is considered overwhelming and the resources and support insufficient. Stress from workload has adverse psychological and physical effects and impedes strategic, visible and active leadership. This study aimed to examine nurse managers' stress from workload and its associations to overall job stress, job satisfaction and practice environment. A survey comprising of the Nursing Context Index was administered to 490 nurse managers in Finnish central hospitals. The study was reported using the STROBE statement. The response rate was 42.7 % (n=209). A statistical analysis revealed that almost every fifth nurse manager experienced high stress from workload with connection to higher job stress overall, higher intent to leave the organization, lower job satisfaction overall, personally and professionally as well as a more negative perception of the practice environment. Nurse managers' job requires adequate resources, clear division of work and better empowering structures.

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4 **stress, job satisfaction and practice environment in central hospitals: A cross-**
5 **sectional study.**
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13 Stress from workload has adverse psychological and physical effects and impedes strategic,
14 visible and active leadership. This study aimed to examine nurse managers' stress from workload
15 and its associations to overall job stress, job satisfaction and practice environment. A survey
16 comprising of the Nursing Context Index was administered to 490 nurse managers in Finnish
17 central hospitals. The study was reported using the STROBE statement. The response rate was
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19 high stress from workload with connection to higher job stress overall, higher intent to leave the
20 organization, lower job satisfaction overall, personally and professionally as well as a more
21 negative perception of the practice environment. Nurse managers' job requires adequate
22 resources, clear division of work and better empowering structures.
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33 **Keywords.** Nursing Management, Leadership, Workload, Stress
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1 INTRODUCTION

Nurse managers deal with a heavy workload as one of the most frequent stressors (1, 2, 3). Nurse managers' volume of tasks and the stress that comes from this workload is so overwhelming that there is very little time or energy for strategic, visible and active leadership that emphasizes organizations' values, objectives and mission to the nursing workforce (4, 5). This causes a vicious cycle, as nurse managers play an important role in fostering a productive and supportive work environment that in turn decreases nurses' job stress and turnover intentions (4, 6). Nursing turnover adds to the managers' workload via several disruptive consequences, such as recruitment challenges, loss of experienced workforce, morale and productivity as well as decreased patient satisfaction (7).

A large number of nurse managers are retiring (8) and the other part is planning to leave their jobs due to burnout and dissatisfaction (9). Recruiting and retaining trained and experienced nurse managers is also a major challenge, as it appears that the next generation of nurses is reluctant to lead (10). The training of a nurse manager takes years, since experience is the primary mechanism to build competency in nursing management (11). Thus, nurse managers' stress from workload needs to be addressed in order to retain not only the managers themselves but also our trained and experienced nursing workforce.

The work of nurse managers has been of interest from several viewpoints in Finland. Those have been e.g. their competence (12, 13), their wellbeing (14), their job content (15), how appreciative is their way of acting (16, 17), further how they perceive organizational social context (18) and their workplace culture (19). Lately also their efforts

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3 to support evidence-based nursing has been studied (20, 21). However, nurse managers
4 workload has not especially been investigated, though nurse managers deal with a heavy
5 workload as one of the most frequent stressors (1, 2, 3).
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12 In Finnish hospitals the nursing management hierarchy typically includes nursing directors
13 (upper level), head nurses (middle level) and assistant head nurses (first level), forming a
14 three-level structure that is typical to any large organization (22). The titles of nurse
15 managers, however, may vary in each hospital. In this study the term nurse manager
16 refers to a person that has managerial tasks, working in any of these levels.
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26 **2 BACKGROUND**

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30 Nurse managers are moderately stressed (1, 2), very stressed (23) or even burned out
31 (24). Workload (1, 2, 25) and related time management challenges are major causes of
32 stress (1, 24). The volume of tasks that nurse managers are required to handle is
33 overwhelming and results in managers feeling overloaded and struggling to keep up with
34 the pace (25).
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44 Nurse managers' work seems like a juggle between several competing priorities, countless
45 interruptions and pressure building expectations from many directions (1, 26). Operating in
46 the middle management level can feel like being caught between two fires (27). The job
47 comes with a stressful demand to be available and responsible for the unit around the
48 clock, which may lead to a sense of imbalance between work and social life (25, 28, 29).
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3 Nurse managers spend a vast amount of time and effort on managing understaffing as a
4 result of staff sick-leaves. Managers may even fill in themselves if no nursing staff is
5 available, and the managerial work that could prevent the issue in the first place is
6 postponed (1, 30). Overall, the lack of proper resources causes stress for nurse managers
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8 (2). Stress from role overload emerges when the role expectations grow bigger than
9 personal skills and resources (23, 29). The amount of managerial tasks per nurse
10 manager can increase as a result of healthcare reform that aims to cut back on workforce
11 expenses (5, 28). Nurse managers may result in feeling overwhelmed with too many
12 things to do, for too many people in too little time - often without the support they need (25,
13 28). The most pervasive tasks end up taking place from other important tasks such as
14 creating a good working environment, yearly appraisal interviews with the staff and
15 motivating and following up on nurses in daily care (5).

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33 Nurse managers experience stress from their financial accountability (2). They are
34 expected to monitor the budget and stick to it, often without comprehensive training (31).
35 Financial insecurity causes worrying, and continuing limitations in the resources challenge
36 nurse managers to balance between finances, quality of care and securing the continuity
37 of operations (26, 28). Lack of information and being left out of the decision-making
38 process cause frustration and sense of not being good enough (27). This relates to the
39 nurse managers' experience of having responsibility but no power (24).

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51 Workload as a major cause of nurse managers' stress has several adverse relations
52 regarding a person's well-being. It has been studied to have a positive association with
53 distress, fatigue, emotional exhaustion, strain, depersonalization, depression, even
54 physical symptoms and global health (32–34). Extensive workload may expose nurse
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3 managers to high effort-reward imbalance that is also highly associated with depressive
4 symptoms (35).
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10 According to a previous study, managers' workload positively predicts the tendency to
11 work excessively, which in turn provokes work-family conflict and lack of psychological
12 detachment (25, 36). Work-to-family conflict and family-to-work conflict as well as role
13 ambiguity and role conflict are work stressors that are all positively associated with the
14 sense of workload (33).
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23 One might wonder why nurse managers stay in these stressful positions. Interestingly, the
24 nurse managers feel that they also have power and autonomy to solve the issues that
25 emerge in their units. The influence that they have on the staff and patient care outcomes
26 encourage them to stay in their positions (37, 38). However, workload is negatively related
27 to a sense of personal accomplishment (33). Workload should be considered as an
28 important part of retaining managers, as workload is significantly associated with job
29 satisfaction (11, 25) and intent to leave one's current position (11, 33, 9). Thus it is pivotal
30 to examine nurse managers' stress from workload and its associations to overall job
31 stress, job satisfaction and practice environment in central hospitals.
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46 **3 METHODS**

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51 This study used a quantitative cross-sectional study design in which the data was collected
52 via an electronic survey and analyzed using descriptive statistics. The Strengthening the
53 Reporting of Observational Studies in Epidemiology (STROBE) statement was used as a
54 guideline to report this study (appendix S1).
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3.1 Participants

The participants in this study were selected using stratified sampling within all of the sixteen central hospitals in Finland. A central hospital exists in each hospital district. Specialized medical care is provided by hospital districts. The provision of the most demanding medical operations is centralized on the national level to the five university hospitals (39). The central hospitals were listed by their population size, ranging from 29 000 to 251 000 people. The hospitals were then divided into groups by their population, with not more than 50 000 people range in population within one group. Two hospitals from each group were selected into the study, minding that also from each of Finland's five specific catchment areas at least one hospital was selected and that the hospitals were located geographically as evenly as possible across Finland. One of the central hospitals was excluded because of its exceptional geographical location, language limitations and the lack of a specific catchment area. From the eight selected hospitals all nurse managers in all levels of the organization were invited to participate in the study (N=490).

The organizational and leadership structures as well as the titles of nurse managers had some variation among the participating hospitals. The contact person of each hospital was informed of the inclusion criteria; that potential respondents that held the role of first level nurse manager such as charge nurse or assistant head nurse or middle or upper level nurse manager such as head nurse, nursing director or a similar role with managerial tasks. With this instruction the contact person decided the recipients of the study invitation.

3.2 Data collection

The participating hospitals were asked to determine their contact person for this study. The only requirement for the contact person was that they had a means and time to forward the survey to all nurse managers in the hospital. In some hospitals the contact person was the Chief Nursing Director or Chief of Nursing Development, but some hospitals named a Nursing Director, a secretary or a research coordinator as a contact person. Cover letter with information about the study and a link to an electronic survey was delivered via email to the contact person, who then forwarded it to all nurse managers in the hospital. Two reminders were sent within the data collection period. 209 responses were received, yielding a response rate of 42.7 % after four weeks data collection period in each hospital.

3.3 Measures

The electronic survey comprised of Nursing Context Index (NCI) instrument in addition to questions about the participants' demographic and occupational characteristics. The NCI developed by Slater and McCormack (40) contains 78 items that generate three constructs and nineteen factors: overall job stress, which contains nine factors (of which one is stress from workload); overall job satisfaction, which contains four factors and overall practice environment supportive of person-centred practice, which contains six factors. Items were measured using a 7-point Likert scale. The main outcome variable is stress from workload containing five items. In these items, the participant is asked to estimate how often they, for example, have felt too much pressure at work during the last week, ranging from never to always (40, 41).

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3 The NCI instrument was originally developed to be used among nurses and this was the
4 first study in which it was used among nurse managers. The internal consistency of the
5 constructs was verified using Cronbach's alpha coefficient, and the values ranged from
6 0.87 to 0.89 in two constructs (job satisfaction and practice environment) and from 0.63 to
7 0.95 in the nineteen factors of job stress, job satisfaction and practice environment. The
8 alpha values corresponded with the previous studies using the same instrument (40, 42,
9 43) and were considered adequate (44). The electronic survey was piloted prior to use
10 with four nurse managers and no changes were seen necessary or applicable as some of
11 the feedback regarded the validated instrument.
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26 **3.4 Data analysis**

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30 Quantitative data was analyzed statistically with SPSS Statistics 26. Sum variables were
31 formed in line with the instructions of instruments. The data was examined and found to
32 deviate from normal distribution. Therefore Median values (Md) and lower (Q_1) and upper
33 quartiles (Q_3) were reported and statistical testing was undertaken using non-parametric
34 Mann Whitney U and Kruskal-Wallis H tests. Probability values < 0.05 were considered as
35 statistically significant. Nurse managers' job satisfaction and job stress were interpreted
36 low with scores lower than three, moderate with scores from three to five and high with
37 scores higher than five. Practice environment was interpreted as not person-centred with
38 scores lower than three, neutral with scores from three to five and person-centred with
39 scores higher than five. High scores in the construct intention to leave were interpreted
40 according to the NCI instrument as positive perceptions of the practice environment and as
41 having little intentions to leave the organization.
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4 RESULTS

A total of 209 completed questionnaires were received. The respondents were 53 years old on average ($Q_1=47$, $Q_3=57$), the youngest being 32 years and oldest 63 years old. 95 % of the respondents were female. The majority (69 %) were middle or upper level managers, such as head nurses and nursing directors, although other titles with similar job descriptions were also in use. 31 % of the respondents were assistant head nurses, charge nurses or other first level nurse managers.

Over half of the respondents (52 %) had less than 10 years of experience as a manager. Little over one third (36 %) of the respondents had 10 to 20 years of experience and only 7 % had more than 20 years of experience as a manager. The average amount of employees that a nurse manager oversaw was 28. Approximately one half of the respondents (49 %) oversaw 20 to 50 employees, every third (31 %) fewer than 20 employees and every fifth (20 %) more than 50 employees. Approximately every other nurse manager also supervised another nurse manager (53 %).

One half of the respondents (50 %) had a Diploma or Associate's Degree as their educational level. 10 % of the respondents had completed a Bachelor's Degree, 23 % had a Master's Degree and 15 % had a Doctoral Degree. A few respondents reported complementing their Diploma or Associate's Degree with studies in management.

Table 1. about here

4.1 Nurse managers' stress from workload and its connection to factors of job stress, constructs and factors of job satisfaction and practice environment

Nurse managers reported moderate stress from workload (Md 4.0, Q₁ 3.2, Q₃ 5.0) with highest scores given to the job entailing too much pressure (Md 5.0, Q₁ 3.0, Q₃ 6.0). Overall, moderate scores were also given to other factors, such as always being in a hurry to complete one's work (Md 4.0, Q₁ 3.0, Q₃ 5.0) and being asked to do too much (Md 4.0, Q₁ 3.0, Q₃ 5.0, table 2.)

Table 2. about here

However, every fifth (20 %, n=40) nurse manager experienced a high level of stress from workload, over half (59 %, n=119) moderate and just over a fifth (21 %, n=42) low. Nurse managers who reported experiencing high levels of stress from workload also reported higher levels of stress in every other attribute than nurse managers who experienced moderate or low levels of stress from workload. High levels of stress from workload was also associated with lower levels of overall job satisfaction ($p<0.001$), personal satisfaction ($p<0.001$) and professional satisfaction ($p<0.001$, table 3).

Table 3. about here

High level of stress from workload was associated with a more negative perception of overall practice environment ($p<0.001$), nurse management ($p=0.012$), empowerment ($p=0.033$) and staffing and resources being adequate ($p<0.001$). Those nurse managers who experienced high levels of stress from workload reported significantly lower scores in the practice environment's attribute of intention to leave ($p<0.001$), which indicated a

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3 stronger intention to leave than nurse managers who reported moderate or low levels of
4 stress from workload. No statistically significant associations were found between stress
5 from workload and respondents' demographic characteristics.
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10 11 12 **5 DISCUSSION** 13 14

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17 In this study nurse managers' stress from workload was overall reported moderate. In an
18 earlier study nurse managers' stress from workload has been on a high level (1). Studying
19 nurse managers' stress from workload can be problematic. Nurse managers that are under
20 a lot of pressure and struggle to manage their work are very likely to not prioritize
21 answering surveys. The response rate of this study was quite high (42,7 %) but it is
22 possible that the nurse managers with the most stress from workload did not actually
23 participate in this study.
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35 The highest scores within stress from workload were given to the job entailing too much
36 pressure, and moderate scores to other factors such as always being in a hurry to
37 complete one's work and being asked to do too much. Earlier studies support this finding,
38 since time pressure has been reported as one of the highest stressors in nurse managers'
39 job (1) and nurse managers often have so many projects going on that they couldn't
40 possibly achieve their goals before another project is already presented (25). The
41 descriptions of nurse managers' daily work include a wide range of managerial work,
42 administrative and financial duties as well as clinical work and other duties (45). Since the
43 stress level was moderate in this study, it is possible that nurse managers sometimes
44 enjoy the variation in their work and do not experience it as an adverse side of the job. The
45 challenge of being asked to do a lot may act as an incentive to achieve more. It is also
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3 possible that the difference in the stress experience between this study and previous
4 studies could be explained by the difference in the average age that could in turn indicate
5 experience in nursing and as a nurse manager. The average age of respondents in this
6 study was 53, which was a little higher than the ones in previous studies (i.e. 1, 23).
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8 Excessive workload may especially target novice nurse managers on the qualitative side
9 of workload since they do not necessarily yet have the skill set to tackle all kinds of
10 problems efficiently. The tasks end up taking so much time and emotional and physical
11 energy that one does not even have the time or possibility to gain new resources or
12 develop skills (33). However, stress from workload did not yield a statistically significant
13 difference with any of the demographic or occupational characteristics in this study.
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28 In this study, it was discovered that a fifth of nurse managers experienced a high level of
29 stress from workload. Interestingly, nurse managers who reported experiencing high levels
30 of stress from workload also reported higher levels of stress in every single other job
31 stress factor than nurse managers who experienced moderate or low levels of stress from
32 workload. These findings do not explain the direction of the association. For instance, it
33 could be that stress from workload causes stress from work-social life balance or that
34 stress from the lack of communication and support causes stress from workload if one
35 feels unsupported in handling all of the work. Previous studies have also discovered that
36 trait negative affectivity has a positive relationship with job stressors such as workload. A
37 nurse manager who has high stress from workload and every other stress factor, could
38 also be high in negative affectivity and unintentionally create stressful work situations or
39 perceive work environments as threatening even when they actually aren't (33).
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56 Nevertheless, nurse managers who experience high levels of stress from workload are
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3 more likely to leave their jobs than nurse managers who reported moderate or low levels of
4 stress from workload. It is therefore vital that we find ways to decrease their stress levels.
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10 High level of stress from workload was associated with lower levels of overall job
11 satisfaction, personal satisfaction and professional satisfaction. This finding is consistent
12 with a previous study that found a correlation between quantitative workload and job
13 satisfaction. Like job stress, there was a connection between job satisfaction and negative
14 affectivity, but also with general health, autonomy and variety (46). This indicates that
15 offering freedom in decision-making, variety in managerial tasks as well as training in
16 enhancing one's self-management and well-being it is possible to affect job satisfaction
17 directly and stress from workload indirectly. Even though the nurse managers with high
18 stress from workload were slightly less satisfied with training as well as pay and prospects,
19 the difference was not statistically significant.
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35 High level of stress from workload was associated with a more negative perception of
36 overall practice environment and in the factors of nurse management, empowerment and
37 adequate staffing and resources. A possible explanation to the more negative perception
38 of nursing management with the nurse managers that experience high stress from
39 workload could be the span of control. The amount of full-time equivalents (FTEs) that
40 nurse managers oversee varies a lot. In this study the average amount of employees per
41 manager was 28, but every fifth nurse manager had more than 50 employees. In this
42 amount of employees the administrative tasks tend to pile up. The manager role might
43 have some work built in that is not even specifically a nursing function. In that case the
44 nurse manager could benefit from an administrative assistant or at least an assistant nurse
45 manager, especially when the span of control is large (25, 47, 48). In a previous study
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3 ward managers reported that after administrative assistants took tasks from the manager's
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5 hands, visible and active leadership was increased and both key performance measures
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7 and staff motivation were improved (47). Instead, often nurse managers are offered more
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9 responsibilities with the same performance expectations and without additional resources
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11 and any tasks taken away (25).
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17 Health service administrators should assist nurse managers in transformational and
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19 participative leadership styles, since they could be beneficial to both nursing staff and the
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21 nurse manager. These leadership styles have a significant relationship with nurses'
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23 turnover intention by engaging the nurses to take part in the decision making and resolving
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25 problems in the workplace autonomously (6). At the same time the need for nurse
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27 managers to take active part in solving problems decreases, saving some time in the
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29 process.
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35 Empowering structures would require opportunities for peer and superior support to a
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37 nurse manager, since the sense of workload is negatively related to general social support
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39 and support by one's supervisor as well as co-workers (33). Excessive workload may
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41 prevent one from fostering interpersonal relationships in the workplace (33) and nurse
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43 managers' job has been described as very lonely and lacking of support since there often
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45 is not enough - or at all - time for it (45). According to a previous study, insufficient
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47 empowerment is one of the most important factors for managers intending to leave (34).
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53 The connection between stress from workload and a more negative perception of
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55 adequate staffing resources is supported by the fact that nurse managers spend an
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57 enormous amount of time managing staff shortages (30). According to a previous study,
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3 staff shortages were also one of nurse managers' biggest stressors (1). Sufficient human
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5 or fiscal resources is one of the most important factors that makes it or breaks it for
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7 managers' recruitment or turnover, as it highlights the manager's ability to ensure high
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9 quality patient care (34, 48).
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15 **5.1 Study limitations**

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19 The data of this study was collected in spring 2016. In a constantly changing world and
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21 healthcare field this forms a limitation to this study, as every set of data is a reflection of its
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23 own time. Although, from the point of view of an active nurse manager of today it seems as
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25 nothing has changed. The workload still is the one aspect of job description that causes
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27 stress the most - every day.
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33 Previous studies indicate that nurse managers are at least moderately stressed or even on
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35 the verge of burning out (i.e. 1, 23, 33) when this study reported that nurse managers
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37 stress levels were low. The questionnaire includes statements that can be considered not
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39 as applicable in describing the work context of nurse managers as the one of nurses.
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41 Partial nonresponse was detected more often in statements in which the patient was
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43 mentioned than the ones the patient was not mentioned in. Also the dimension of job
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45 stress did not include statements about financial control and following a budget, constant
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47 measuring of operations, role distress and overload and round-the-clock responsibility,
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49 which are important stressors for nurse managers according to previous studies (i.e. 28,
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51 29, 33). It appears that the instrument could be further developed and tested to better
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53 describe nurse managers' work context. However, the construct of workload was, in the
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3 researchers' opinion, applicable to describe the nurse managers' stress as it did not focus
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5 on statements about direct patient care.
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10 Concerned the data collection, some amount of variation existed among the selected
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12 hospitals and what they included in the central hospital activities, thus impacting how many
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14 nurse managers existed. However, the ultimate goal was to reach all nursing managers in
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16 the selected central hospitals. Central hospitals in addition to university hospitals of the
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18 hospital districts are responsible for the most demanding medical operations and
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20 specialised medical care services are provided at hospitals in Finland. Specialised medical
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22 care refers to examinations and treatments, such as surgeries, provided by medical
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24 specialists at hospitals (39). This study included nursing units from a range of different
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26 specialties as seen in Table 1, and is therefore also generalizable to various nursing
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28 settings.
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35 **6 CONCLUSION**

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40 Nurse managers working nationwide in Finnish central hospitals reported moderate levels
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42 of stress from workload. However, every fifth nurse manager experienced a high level of
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44 stress from workload, which is associated with increased job stress in numerous aspects,
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46 decreased overall job satisfaction and negative perception of practice environment. This
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48 study reveals a critical need to identify those around 20% nurse managers, who
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50 experience high levels of stress from workload in order to support and retain them in their
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52 positions and to enhance their satisfaction.
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3 Nurse managers' perceptions of workload should be taken into consideration when
4 designing leadership structures and dividing work in certain organizations. Nursing
5 management needs adequate staffing and resources, clear division of work and better
6 empowering structures as a foundation from which to face the future challenges of
7 healthcare reform. Stress from workload could be addressed by enhancing nurse
8 managers' personal and professional satisfaction by enabling a better work-life balance
9 and offering training in self-management and well-being.
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21 **7 ETHICAL CONSIDERATIONS**

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26 The approval from a Research Ethics Committee was not required for this kind of survey in
27 Finland according to the Medical Research Act (49). Appropriate study approvals were
28 obtained from all participating hospitals before conducting the survey. The authors also
29 obtained a permission to use the Nursing Context Index instrument. The survey was
30 completed anonymously, and written consent forms could not therefore be collected. The
31 respondents were delivered a comprehensive information letter about the study. After that,
32 answering the survey was considered as informed consent to participate in the study. The
33 anonymity of the respondents was also protected throughout the study, for example by
34 grouping the respondents if there were few respondents in certain health care units or
35 demographic characteristics. The data is stored on a password protected hard drive by the
36 head researcher as long as it is still needed in the research project. When there is no
37 further use for the data, it will be appropriately destroyed.
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9 AUTHOR CONTRIBUTIONS

Planning: AA, BB, CC; Data collection: AA; Data Analysis: AA, BB, CC; Manuscript preparation: AA, BB, CC, DD; Manuscript review: AA, BB, CC, DD. All authors have approved of the final version of the manuscript being submitted.

10 DECLARATION OF CONFLICTING INTERESTS

The authors declare that there is no conflict of interest.

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REFERENCES

1. Pegram AM, Grainger M, Jones K, et al. An exploration of the working life and role of the ward manager within an acute care hospital organisation. *Journal of Research in Nursing*, 2015; 20: 312–328.
2. Labrague LJ, McEnroe-Petitte DM, Leocadio MC, et al. Stress and ways of coping among nurse managers: An integrative review. *J Clin Nurs*, 2018; 27: 1346–1359.
3. Loveridge S. Straight talk: Nurse manager role stress. *Nurs Manage*, 2017; 48: 20–27.
4. Pishgooie AH, Atashzadeh-Shoorideh F, Falcó-Pegueroles A, et al. Correlation between nursing managers' leadership styles and nurses' job stress and anticipated turnover. *J Nurs Manag*, 2019; 27: 527–534.
5. Kristiansen M, Westernen KI, Obstfelder A, et al. Coping with increased managerial tasks: tensions and dilemmas in nursing leadership. *Journal of Research in Nursing*, 2016; 21: 492–502.
6. Magbity JB, Ofei AMA and Wilson D. Leadership styles of nurse managers and turnover intention. *Hospital Topics*, 2020; 98: 45–50.
7. Dewanto A and Wardhani V. Nurse turnover and perceived causes and consequences: a preliminary study at private hospitals in Indonesia. *BMC Nurs*, 2020; 17: (Suppl 2), 52
8. Mossburg SE. Baby boomer retirement: Are you up to the challenge?. *Nurse Manage*, 2018; 3: 13–14.
9. Warshawsky NE, Wiggins AT and Rayens MK. The influence of the practice environment on nurse managers' job satisfaction and intent to leave. *J Nurs Adm*, 2016; 46: 501–507.
10. Dyess SM, Sherman RO, Pratt BA et al. Growing nurse leaders: Their perspectives on nursing leadership and today's practice environment. *OJIN*, 2016; 1:
11. Keith AC, Neff D and Parchment J. Factors that influence nurse manager job satisfaction: An integrated literature review. *J Nurs Manag*, 2020; 00: 1–12.
12. Kantanen K, Kaunonen M, Helminen M, Suominen T. Leadership and management competencies of head nurses and directors of nursing in Finnish social and health care. *Journal of Research in Nursing*, 2017; 22: 228–244.
13. Lehtonen M-R, Roos M, Kantanen K, et al. International Nursing: Nurse Managers' Leadership and Management Competencies Assessed by Nursing Personnel in a Finnish Hospital. *Nurs Adm Q*, 2018; 42: 164–174.
14. Häggman-Laitila A, Romppanen J. Outcomes of interventions for nurse leaders' well-being at work: A quantitative systematic review. *J Adv Nurs*, 2018; 74: 34–44.
15. Bjerregård Madsen J, Kaila A, Vehviläinen-Julkunen K, et al. The job contents of directors of nursing and frontline nurse managers in specialized health care. (Hoitotyön johtajien ja lähijohtajien työn sisältö erikoissairaanhoidossa.) *Hoitotiede*, 2020; 32: 75–85.
16. Niemi R, Roos M, Harmoinen M, et al. Appreciative management assessed by physiotherapists working in public or private sector: A cross-sectional study. *Physiother Res Int*, 2018; 23:e1724.
17. Harmoinen M, Suominen T. Realizing appreciative management from the viewpoint of first-line managers in social and health care. *Scand J Caring Sci*, 2020; 34: 78–86.

18. Viinikainen S, Rostila I, Green P, et al. The organizational social context in public healthcare as viewed by first-line nursing managers: A cross-sectional study. *Nord J Nurs Res*, 2019; 40: 89–96.
19. Jäppinen K, Roos M, Suominen T. The experience of workplace culture among nurse managers in central hospital (Keskussairaaloiden hoitotyön esimiesten kokemus työpaikkakulttuurista. Tutkiva hoitotyö) *Nursing Evidence*, 2019; 17: 3–13.
20. Välimäki T, Partanen P, Häggman-Laitila A. An Integrative Review of Interventions for Enhancing Leadership in the Implementation of Evidence-Based Nursing. *Worldviews Evid Based Nurs*, 2018; 15: 424–431.
21. Lunden A, Teräs M, Kvist T, et al. Nurse leaders' perceptions and experiences of leading evidence: A qualitative enquiry. *J Nurs Manag*, 2019; 27: 1859–1868.
22. Singh H and Prakash N. Differences in physical, behavioral and emotional health of managers at different levels of management. *Indian Journal of Health and Wellbeing*, 2019; 10: 180–188.
23. Kath LM, Stichler JF, Ehrhart MG, et al. Predictors and outcomes of nurse leader job stress experienced by AWHONN members. *J Obstet Gynecol Neonatal Nurs*, 2013; 42: E12–25.
24. Van Bogaert P, Adriaenssens J, Dilles T, et al. Impact of role-, job- and organizational characteristics on nursing unit managers' work related stress and well-being. *J Adv Nurs*, 2014; 70: 2622–2633.
25. Loveridge S. Straight talk: Nurse manager role stress. *Nurs Manage*, 2017; 48: 20–27.
26. Udod SA, Cummings GG, Care WD, et al. Role stressors and coping strategies among nurse managers. *Leadersh Health Serv*, 2017; 30: 29–43.
27. Ericsson U and Augustinsson S. The role of first line managers in healthcare organisations – a qualitative study on the work life experience of ward managers. *Journal of Research in Nursing*, 2015; 20: 280–295.
28. Warshawsky NE, Lake SW and Brandford A. Nurse managers describe their practice environments. *Nurs Adm Q*, 2013; 37: 317–325.
29. Keys Y. Looking ahead to our next generation nurse leaders: generation X nurse managers. *J Nurs Manag*, 2014; 22: 97–105.
30. Tewes R and Fischer T. Too busy to lead? Current challenges for German nurse leaders. *J Nurs Manag*, 2017; 25: 1–3.
31. Udod SA and Care WD. Nurse managers' work stressors and coping experiences: unravelling the evidence. *Nurs Leadersh*, 2011; 24: 57–71.
32. Nixon AE, Mazzola JJ, Bauer J, et al. Can work make you sick? A meta-analysis of the relationships between job stressors and physical symptoms. *Work & Stress*, 2011; 25: 1–22.
33. Bowling NA, Alarcon GM, Bragg CB, et al. A meta-analytic examination of the potential correlates and consequences of workload. *Work & Stress*, 2015; 29: 95–113.
34. Hewko SJ, Brown P, Fraser KD, et al. Factors influencing nurse managers' intent to stay or leave: a quantitative analysis. *J Nurs Manag*, 2015; 23: 1058–1066.
35. Nourry N, Luc A, Lefebvre F, et al. Psychosocial and organizational work environment of nurse managers and self-reported depressive symptoms: Cross-sectional analysis from a cohort of nurse managers. *Int J Occup Med Environ Health*, 2014; 27: 252–269.

- 1
2
3 36. Huyghebaert T, Fouquerau E, Lahiani F-J, et al. Examining the longitudinal effects
4 of workload on ill-being through each dimension of workaholism. *International*
5 *Journal of Stress Management*, 2018; 25: 144–162.
- 6 37. Adriaenssens J, Hamelink A, Bogaert PV. Predictors of occupational stress and
7 well-being in First-Line Nurse Managers: A cross-sectional survey study. *Int J Nurs*
8 *Stud*, 2017; 73: 85–92.
- 9 38. Conley KA. Nurse manager engagement: Strategies to enhance and maintain
10 engagement. *J Nurs Adm*, 2017; 47: 454–457.
- 11 39. Ministry of Social Affairs and Health. Hospitals and specialised medical care,
12 https://stm.fi/en/article/-/asset_publisher/sairaalat-ja-erikoissairaanhoi-1 (2019,
13 accessed 10 november 2020).
- 14 40. Slater P, McCormack B and Bunting B. The development and pilot testing of an
15 instrument to measure nurses' working environment: the Nursing Context Index.
16 *Worldviews Evid Based Nurs*, 2009; 6: 173–182.
- 17 41. McCormack B, Dewing J, Breslin L, et al. Developing person-centred practice:
18 nursing outcomes arising from changes to the care environment in residential
19 settings for older people. *Int J Older People Nurs*, 2010; 5: 93–107.
- 20 42. Hahtela N. *Workplace culture in primary health care: the connection to nursing-*
21 *sensitive outcomes*. PhD Thesis, University of Tampere, Finland, 2015.
- 22 43. Eskola S, Roos M, McCormack B, et al. Workplace culture among operating room
23 nurses. *J Nurs Manag*, 2016; 24: 725–734.
- 24 44. Tavakol M and Dennick R. Making sense of Cronbach's alpha. *Int J Med Educ*,
25 2011; 2: 53–55.
- 26 45. Bjerregård Madsen J, Kaila A, Vehviläinen-Julkunen K, et al. Time allocation and
27 temporal focus in nursing management: an integrative review. *J Nurs Manag*, 2016;
28 24: 983–993.
- 29 46. Djukic M, Jun J, Kovner C, et al. Determinants of job satisfaction for novice nurse
30 managers employed in hospitals. *Health Care Manage Rev*, 2017; 42: 172–183.
- 31 47. Locke R, Leach C, Kitsell F, et al. The impact on the workload of the Ward Manager
32 with the introduction of administrative assistants. *J Nurs Manag*, 2011; 19: 177–185.
- 33 48. Martin E and Kallmeyer R. Strategies to Recruit the Next Generation of Nursing
34 Leadership Talent. *J Nurs Adm*, 2018; 48: 368–374.
- 35 49. *Medical Research Act (488/1999)*,
36 https://www.finlex.fi/en/laki/kaannokset/1999/en19990488_20100794.pdf (accessed
37 31 march 2021).
- 38
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Table 1. Nurse managers' demographic characteristics.

Demographic characteristics	%	n
Management Position		
Middle or upper level managers	69.4	145
First level managers	30.6	64
Educational Level		
Diploma/Associate's Degree	50.2	105
Bachelor's Degree	9.6	20
Master's Degree	23.0	48
Doctoral Degree	14.9	31
Other	2.4	5
Experience as a manager		
< 10 years	52.2	108
10 to 20 years	35.7	74
> 20 years	12.1	25
Experience in current position		
< 10 years	75.0	150
10 to 20 years	18.0	36
> 20 years	7.0	14
Amount of employees		
< 20	31.3	65
20 to 50	48.6	101
> 50	20.2	42
At least one nurse manager as an employee		
Yes	53.4	111
No	46.6	97
Direct patient care % of work hours		
0 %	30.4	63
1 to 30 %	43.0	89
> 30 %	26.6	55
Type of unit		
Outpatient	33.8	66
Inpatient	36.4	71
Both	27.8	58
Unit in operation 24/7		
Yes	64.6	133
No	35.4	73
Specialty of unit		
Surgical medicine	25.0	52
Psychiatry & alcohol and substance abuse care	17.7	37
Internal medicine	12.5	26
Emergency medicine	11.4	24
Several specialties	10.5	22
Laboratory, radiology and pathology	8.6	18
OB/GYN and pediatric specialties	8.6	18
Other	5.7	12

Md, median; Q₁,Q₃, upper and lower quartiles

Table 2. Nurse managers' stress from workload

	n	Md	Q₁	Q₃	α
Stress from Workload	201	4.0	3.2	5.0	0.904
Too much pressure	209	5.0	3.0	6.0	
Always in a hurry	209	4.0	3.0	5.0	
Asked to do too much	209	4.0	3.0	5.0	
Stressful job	206	4.0	3.0	5.0	
Too busy to meet standards	203	3.0	2.0	4.0	

Md, median; Q₁, Q₃, lower and upper quartiles; α, Cronbach's alpha coefficient; range 1-7

Table 3. Association between stress from workload and the other constructs and factors of the NCI instrument.

Constructs and factors	Stress from workload			p
	Low	Moderate	High	
	Md (Q₁, Q₃)	Md (Q₁, Q₃)	Md (Q₁, Q₃)	
Stress				
Inadequate preparation	2.0 (1.3, 2.7)	2.7 (2.0, 3.3)	3.7 (2.2, 4.0)	<0.001
Work-social life balance	1.5 (1.3, 2.0)	2.5 (2.0, 3.0)	3.4 (2.6, 4.3)	<0.001
Lack of staff support	2.3 (1.3, 3.0)	2.3 (1.7, 3.0)	3.3 (2.8, 4.0)	<0.001
Working environment	1.5 (1.3, 2.1)	2.0 (1.8, 2.8)	3.1 (2.3, 3.8)	<0.001
Lack of communication and support	2.0 (1.6, 2.4)	2.6 (2.0, 3.4)	3.0 (2.6, 3.6)	<0.001
Uncertainty regarding treatment	1.5 (1.0, 2.3)	2.0 (1.3, 2.5)	2.6 (1.3, 3.2)	0.005
Career development	1.3 (1.2, 1.8)	2.0 (1.5, 2.5)	2.5 (2.0, 3.9)	<0.001
Conflict with other nurses	1.4 (1.0, 2.3)	1.8 (1.5, 2.3)	2.1 (1.6, 2.9)	<0.001
Job satisfaction	5.2 (4.7, 5.7)	5.0 (4.6, 5.4)	4.4 (3.8, 5.1)	<0.001
Satisfaction with pay and prospects	4.1 (3.6, 4.8)	4.0 (3.6, 4.8)	3.6 (3.1, 4.7)	0.066
Satisfaction with training	6.0 (5.0, 6.1)	6.0 (5.0, 6.0)	5.5 (4.3, 6.0)	0.063
Personal satisfaction	5.8 (5.0, 6.1)	5.4 (4.8, 6.0)	4.6 (4.1, 5.4)	<0.001
Professional satisfaction	5.6 (5.0, 6.0)	5.4 (4.8, 5.6)	4.4 (3.8, 5.2)	<0.001
Practice environment	5.2 (4.8, 5.6)	4.9 (4.5, 5.3)	4.5 (3.9, 5.1)	<0.001
Adequate staffing and resources	5.3 (4.7, 5.8)	4.5 (3.3, 5.0)	3.5 (2.6, 4.7)	<0.001
Nurse-doctor relationship	6.0 (4.9, 6.0)	5.3 (5.0, 6.0)	5.5 (4.7, 6.0)	0.194
Nurse management	5.4 (5.0, 5.9)	5.1 (4.7, 5.6)	4.9 (4.3, 5.3)	0.012
Organisational commitment	4.7 (4.0, 5.3)	4.7 (4.0, 5.7)	4.7 (3.7, 5.3)	0.335
Empowerment	5.0 (4.1, 5.5)	4.5 (3.8, 5.3)	4.1 (3.0, 5.2)	0.033
Intention to leave	6.2 (4.3, 7.0)	6.0 (4.7, 6.3)	4.3 (3.0, 5.9)	<0.001

Md, median; Q₁, Q₃, lower and upper quartiles; range 1-7

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-7
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	6-8
Study size	10	Explain how the study size was arrived at	6-7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	8
		(b) Describe any methods used to examine subgroups and interactions	8
		(c) Explain how missing data were addressed	-
		(d) If applicable, describe analytical methods taking account of sampling strategy	-
		(e) Describe any sensitivity analyses	-
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9, Tables 1-2
		(b) Give reasons for non-participation at each stage	-
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9
		(b) Indicate number of participants with missing data for each variable of interest	Tables 1-2
Outcome data	15*	Report numbers of outcome events or summary measures	Tables 2-3
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted	-

		estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	
		(b) Report category boundaries when continuous variables were categorized	-
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	10-11
Discussion			
Key results	18	Summarise key results with reference to study objectives	11-15
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	15-16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-15
Generalisability	21	Discuss the generalisability (external validity) of the study results	15-16
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	18

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.