BURNOUT IN NURSING: A THEORETICAL REVIEW

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# ABSTRACT

**Background:** Workforce studies often identify burnout as a nursing ‘outcome’. Yet burnout itself - what constitutes it, what factors contribute to its development, and what the wider consequences are for individuals, organisations or their patients – is rarely made explicit.We aimed to provide a comprehensive summary of research that examines theorised relationships between burnout and other variables, in order to determine what is known (and not known) about the causes and consequences of burnout in nursing, and how this relates to theories of burnout.

**Methods:** We searched MEDLINE, CINAHL and PsycINFO.We included quantitative primary empirical studies (published in English) which examined associations between burnout and work-related factors in the nursing workforce.

**Results:** 91 papers were identified. The majority (n=87) were cross-sectional studies; 39 studies used all three subscales of the Maslach Burnout Inventory (MBI) scale to measure burnout. As hypothesised by Maslach we identified high workload, value incongruence, low control over the job, low decision latitude, poor social climate/social support, and low rewards as predictors of burnout. Maslach suggested that turnover, sickness absence and general health were effects of burnout; however we identified relationships only with general health and sickness absence. Other factors that were classified as predictors of burnout in the nursing literature where low/inadequate nurse staffing levels, ≥12-hour shifts, and low schedule flexibility, time pressure, high job & psychological demands, low task variety, role conflict, low autonomy, negative nurse-physician relationship, poor supervisor/leader support, poor leadership, negative team relationship, job insecurity. Among the outcomes of burnout we found: reduced job performance, poor quality of care, poor patient safety, adverse events, patient negative experience, medication errors, infections, patient falls, and intention to leave.

**Conclusions:** The patterns identified by these studies consistently show that adverse job characteristics - high workload, low staffing levels, long shifts, low control are associated with burnout in nursing. The potential consequences for staff and patients are severe. The literature on burnout in nursing partly supports Maslach’s theory, but some areas are insufficiently tested, in particular the association between burnout and turnover, and relationships were found for some MBI dimensions only.

KEYWORDS: burnout; nursing; Maslach Burnout Inventory; job-demands; practice environment

# INTRODUCTION

The past decades have seen a growing research and policy interest around how work organisation characteristics impact upon different outcomes in nursing. Several studies and reviews have considered relationships between work organisation variables, and outcomes such as quality of care, patient safety, sickness absence, turnover, and job dissatisfaction.(1-4). Burnout is often identified as a nursing ‘outcome’ in workforce studies that seek to understand the effect of context and ‘inputs’ on outcomes in health care environments. Yet burnout itself - what constitutes it, what factors contribute to its development, and what the wider consequences are for individuals, organisations or their patients – is not always elucidated in these studies.

The term *burnout* was introduced by Freudenberger in 1974 when he observed a loss of motivation and reduced commitment among volunteers at a mental health clinic.(5) It was Maslach who developed a scale, the Maslach Burnout Inventory (MBI), which internationally is the most widely used instrument to measure burnout.(6) According to Maslach’s conceptualisation, burnout is a response to excessive stress at work, which is characterised by feelings of being emotionally drained and lacking emotional resources – Emotional Exhaustion; by a negative and detached response to other people and loss of idealism – Depersonalisation; and by a decline in feelings of competence and performance at work – reduced Personal Accomplishment.(7)

Maslach theorised that burnout is a state, which occurs as a result of a prolonged mismatch between a person and at least one of the following six dimensions of work:(7, 8) (9)

1. Workload: excessive workload and demands, so that recovery cannot be achieved
2. Control: employees do not have sufficient control over the resources needed to complete or accomplish their job
3. Reward: lack of adequate reward for the job done. Rewards can be financial, social, and intrinsic (i.e. the pride one may experience when doing a job)
4. Community: employees do not perceive a sense of positive connections with their colleagues and managers; leading to frustration and reducing the likelihood of social support
5. Fairness: a person perceiving unfairness at the workplace, including inequity of workload and pay
6. Values: employees feeling constrained by their job to act against their own values and their aspiration; or when they experience conflicts between the organisation’s values

Maslach theorised these six work characteristics as factors causing burnout, and placed deterioration in employees’ health and job performance as outcomes arising from burnout.(7)

Subsequent models of burnout differ from Maslach’s in one of two ways: they do not conceptualise burnout as an exclusively work-related syndrome; they view burnout as a process rather than a state.(10)

The job resources-demands model(11) builds on the view of burnout as a work-based mismatch, but differs from Maslach’s model in that it posits that burnout develops via two separate pathways: excessive job demands leading to exhaustion, and insufficient job resources leading to disengagement. Along with Maslach and Schaufeli, this model sees burnout as the negative pole of a continuum of employee well-being, with ‘work engagement’ as the positive pole.(12)

Among those who regard burnout as a process, Cherniss used a longitudinal approach to investigate the development of burnout in early career human services workers. Burnout is presented as a process characterised by negative changes in attitudes and behaviours towards clients that occur over time, often associated with workers’ disillusionment about the ideals that had led them to the job.(13) Gustavsson and colleagues used this model in examining longitudinal data on early career nurses, and found that exhaustion was a first phase in the burnout process, proceeding further only if nurses present dysfunctional coping (i.e. cynicism and disengagement).(14)

Shirom and colleagues suggested that burnout occurs when individuals exhaust their resources due to long-term exposures to emotionally demanding circumstances in both work and life settings, suggesting that burnout is not exclusively an occupational syndrome.(15) (16)

This review aims to identify research that has examined theorised relationships with burnout, in order to determine what is known (and not known) about factors associated with burnout in nursing and to determine the extent to which studies have been underpinned by, and/or have supported or refuted, theories of burnout.

# METHODS

## 2.1 Design

This was a theoretical review conducted according to the methodology outlined by Campbell and Pare.(17, 18) Theoretical reviews draw on empirical studies to understand a concept from a theoretical perspective, and highlight knowledge gaps. Theoretical reviews are systematic in terms of searching and inclusion/exclusion criteria, and do not include a formal appraisal of quality. They have been previously used in nursing, but not focussing on burnout.(19) While no reporting guideline for theoretical reviews currently exists, the PRISMA-ScR was deemed to be suitable, with some modifications, to enhance the transparency of reporting for the purposes of this review. The checklist, which can be found as Supplementary, has been modified as follows:

* Checklist title has been modified to indicate that the checklist has been adapted for theoretical reviews
* Introduction (item 3) has been modified to reflect that the review questions lend themselves to a theoretical review approach
* Selection of sources of evidence (item 9) has been modified to state the process for selecting sources of evidence in the theoretical review
* Limitations (item 20) has been amended to discuss limitations of the theoretical review process
* Funding (item 22) has been amended to describe sources of funding and role of funders in the theoretical review.

All changes from the original version have been highlighted.

## 2.2. Literature search

A systematic search of empirical studies examining burnout in nursing published in journal articles since 1975 was performed in May 2019, using MEDLINE, CINAHL and PsycINFO. The main search terms were “burnout” and “nursing”, using both free-search terms and indexed terms, synonyms and abbreviations. The full search and total number of papers identified is in Additional File 1.

We included papers written in English that measured the association between burnout and work related factors or outcomes in all types of nurses or nursing assistants working in a healthcare setting, including hospitals, care homes, primary care, the community, ambulance services. Because there are different theories of burnout, we did not restrict the definition of burnout according to any specific theory. Burnout is a work-related phenomenon (8), so we excluded studies focussing exclusively on personal factors (e.g. gender, age). Our aim was to identify theorised relationships; therefore, we excluded studies which were only comparing levels of burnout among different settings (e.g. in cancer services vs emergency departments). We excluded literature reviews, commentaries and editorials.

## 2.3 Data extraction and quality appraisal

The following data were extracted from included studies: country; setting; sample size; staff group; measure of burnout; variables the relationship with burnout was tested against; findings against the hypothesised relationships. One reviewer (MEB) extracted data from all the studies, with CDO and JEB extracting 10 studies each to check for agreement in data extraction. In line with the theoretical review methodology, we did not formally assess the quality of studies (19). However, in Table 1 we have summarised key aspects of quality for each study, covering: generalisability (e.g. a multisite study with more than 500 participants); risk of bias from common methods variance (e.g. burnout and correlates assessed with the same survey. This bias arises when there is shared (common) variance because of the common method rather than a true (causal) association between variables); evidence of clustering (e.g. nurses nested in wards, wards nested in hospitals); and evidence of statistical adjustment (e.g. the association between burnout and correlates has been adjusted to control for potentially influencing variables). It should be noted that cells are shaded in green when the above-mentioned quality standards have been met, and in red when they have not. In the discussion, we offer a reflection on the common limitations of research in the field and present a graphic summary of the ‘strength of evidence’ in Figure 2.

## 2.4 Data synthesis

Due to the breadth of the evidence, we summarised extracted data by identifying common categories through a coding frame. The starting point of the coding frame was the burnout multidimensional theory outlined by Maslach (7). We then considered whether the studies’ variables fit into Maslach’s categorisation, and where they did not, we created new categories. We identified nine broad categories: 1) Areas of Worklife; 2) Workload and Staffing Levels; 3) Job Control, Reward, Values, Fairness, Community; 4) Shift Work and Working Patterns; 5) Psychological Demands and Job Complexity; 6) Support Factors: working relationships and Leadership; 7) Work Environment and Hospital Characteristics; 8) Staff Outcomes and Job performance; 9) Patient Care and Outcomes. In the literature, categories 1-7 were treated as predictors of burnout, and categories 8-9 as outcomes, with the exception of missed care and job satisfaction which were treated both as predictors and outcomes.

When the coding frame was finalised, CDO and MLR applied it to all studies. Where there was disagreement, a third reviewer (JEB) made the final decision.

# RESULTS

The database search yielded 12,248 studies, of which 11,870 were rapidly excluded as either duplicates or titles and/or abstract not meeting the inclusion criteria. Of the 368 studies accessed in full text, 277 were excluded, and 91 studies were included in the review. Figure 1 presents a flow chart of the study selection.

Figure 1 Study selection flow chart

The 91 studies identified covered 28 countries; four studies included multiple countries and in one, the country was not reported. Most were from North America (n= 35), Europe (n=28), and Asia (n=18).

The majority had cross-sectional designs (n= 87, 97%); of these, 84 were entirely survey based. Three studies were longitudinal. Most studies were undertaken in hospitals (n=82). Eight studies surveyed nurses at a national level, regardless of their work setting.

Sample sizes ranged from hundreds of hospitals (max = 927) with hundreds of thousands of nurses (max = 326,750)(20) to small single site studies with the smallest sample being 73 nurses.(21) (see Table 1).

Table 1 here

The relationships examined are summarised in Table 2.

Table 2 here

## 3.1 Measures of burnout

Most studies used the Maslach Burnout Inventory Scale (n=81), which comprises three sub-scales reflecting the theoretical model: Emotional Exhaustion, Depersonalisation, and reduced Personal Accomplishment. However, less than half (47%, n=39) of the papers measured and reported results with all three subscales. Twenty-three papers used the Emotional Exhaustion subscale only, and 11 papers used the Emotional Exhaustion and Depersonalisation subscales. In nine studies the three MBI subscales were summed up to provide a composite score of burnout, despite Maslach and colleagues advising against such an approach.(22)

Five studies used the Copenhagen Burnout Inventory (CBI).(23) This scale consists of three dimensions of burnout: personal, work-related, and client-related. Two studies used the Malach-Pines scale,(24) and one used the burnout subscale of the Professional Quality of Life Measure (ProQOL5) ProQol 5 scale, which posits burnout as an element of compassion fatigue.(25) Two studies used idiosyncratic measures of burnout based on items from other instruments.(20, 26)

## Factors examined in relation to Burnout: Overview

The studies which tested relationships between burnout and Maslach’s six areas of work life – workload, control, reward, community, fairness and values - typically supported Maslach’s theory that these areas are predictors of burnout. However, some evidence is based only on certain MBI dimensions. High scores on the *Areas of worklife scale*(27) (indicating a higher degree of congruence between the job and the respondent), were associated with less likelihood of burnout, either directly(28, 29) or through high occupational coping self-efficacy(30) and presence of civility norms and co-worker incivility.(31)

The majority of studies looking at job characteristics hypothesised by the Maslach model considered workload (n=31) and job control and reward (n=10). Whilst only a few studies (n=9) explicitly examined the hypothesised relationships between burnout and community, fairness, or values, we identified 39 studies that covered “supportive factors” including relationships with colleagues and leadership.

A large number of studies included factors that fall outside of the Maslach model. Six main areas were identified:

* working patterns and shifts working (n=15)
* features inherent in the job such as psychological demand and complexity (n=24)
* job support from working relationships and leadership (n=39)
* hospital or environmental characteristics (n=28)
* staff outcomes and job performance (n=33)
* patient outcomes (n=17)
* individual attributes (personal or professional) (n=16)

## Workload and Staffing Levels

Workload and characteristics of jobs that contribute to workload, such as staffing levels, was the most frequently examined factor in relation to burnout. Thirty studies found an association between high workload and burnout.

Of these, 13 studies looked specifically at measures of workload as a predictor of burnout. Workload was associated with Emotional Exhaustion in five studies,(32-36) with some studies also reporting a relationship with Depersonalisation, and others Cynicism. Janssen reported that ‘mental work overload’ predicted Emotional Exhaustion.(37) Three studies concluded that workload is associated with both Emotional Exhaustion and Depersonalisation.(38-40). Kitaoka-Higashiguchi tested a model of burnout and found that heavy workload predicted Emotional Exhaustion, which in turn predicted Cynicism.(41) This was also observed in a larger study by Greengrass et al who found that high workload was associated with Emotional Exhaustion, which consequently predicted Cynicism.(42) One study reported no association between workload and burnout components,(43) and one study found an association between manageable workload and a composite burnout score.(44)

A further 15 studies looked specifically at nurse staffing levels, and most reported that when nurses were caring for a higher number of patients or were reporting staffing inadequacy, they were more likely to experience burnout. No studies found an association between better staffing levels and burnout.

While three studies did not find a significant association with staffing levels,(32, 45, 46) three studies found that higher patient-to-nurse ratios were associated with Emotional Exhaustion,(47-49) and in one study higher patient-to-nurse-ratios were associated with Emotional Exhaustion, Depersonalisation and Personal Accomplishment.(50) One study concluded that Emotional Exhaustion mediated the relationship between patient-to-nurse ratios and patient safety.(51) Akman and colleagues found that the lower the number of patients nurses were responsible for, the lower the burnout composite score.(52) Similar results were highlighted by Faller and colleagues.(53) Lower RN hours per patient day were associated with burnout in a study by Thompson.(20)

When newly qualified RNs reported being short staffed, they were more likely to report Emotional Exhaustion and Cynicism one year later.(54) In a further study, low staffing adequacy was associated with Emotional Exhaustion.(55) Similarly, Leineweber and colleagues found that poor staff adequacy was associated with Emotional Exhaustion, Depersonalisation and Personal Accomplishment.(56) Leiter explored the relationship between staffing adequacy and all MBI subscales and found that Emotional Exhaustion mediated the relationship between staffing adequacy and Depersonalisation.(57) Time pressure was investigated in three studies, which all concluded that reported time pressure was associated with Emotional Exhaustion.(58-60)

In summary, there is evidence that high workload is associated with Emotional Exhaustion; nurse staffing levels are associated to burnout; and time pressure is associated to Emotional Exhaustion.

## Job Control, Reward, Values, Fairness, and Community

Having control over the job was examined in seven studies. Galletta et al found that low job control was associated with all MBI subscales,(40) as did Gandi et al.(61) Leiter and Maslach found that control predicted fairness, reward, and community, and in turn fairness predicted values, and values predicted all MBI subscales.(35) Low control predicted Emotional Exhaustion only for nurses working the day shift,(62) and Emotional Exhaustion was significantly related to control over practice setting.(63); two studies reported no effect of job control on burnout.(44, 64)

Reward predicted Cynicism(35) and burnout on a composite score.(44) Shamian and colleagues found that a higher score in the effort and reward imbalance scale was associated with Emotional Exhaustion, and higher scores in the effort and reward imbalance scale were associated with burnout measured by the CBI.(65)

Value congruence refers to a match between the requirements of the job and people’s personal principles.(7) Value conflicts were related with a composite score of burnout,(44), and one study concluded that nurses with high value congruence reported lower Emotional Exhaustion than those with low value congruence, and nurses with low value congruence experienced more severe Depersonalisation than nurses with high value congruence.(66) Low value congruence was a predictor of all three MBI dimensions,(35) and of burnout measured with the Malach-Pines Burnout scale.(67) Two studies considered social capital, defined as a social structure that benefit its members including trust, reciprocity, and a set of shared values, and they both concluded that lower social capital in the hospital predicted Emotional Exhaustion.(33, 36). A single study showed fairness predicted values, which in turn predicted all MBI scales.(35) Two studies looked at community, and one found that community predicts a composite score of burnout (44), while the other found no relationships.(35)

While not directly expressed in the terms described by Maslach, other studies demonstrate associations with possible causal factors, many of which are reflected in Maslach’s theory.

In summary, there is evidence that control over the job is associated with reduced burnout, and value congruence is associated with reduced Emotional Exhaustion and Depersonalisation.

## Working Patterns and Shift work

Shift work and working patterns variables were considered by 15 studies. Overall, there was mixed evidence on the relationship between night work, number of hours worked per week and burnout, with more conclusive results regarding the association between long shifts and burnout, and the potential protective effect of schedule flexibility.

Working night shifts was associated with burnout (composite score)(68) and Emotional Exhaustion,(62) but the relationship was not significant in two studies.(69, 70) Working on permanent as opposed to rotating shift patterns did not impact burnout,(71) but working irregular shifts did impact a composite burnout score.(72) When nurses reported working a higher number of shifts they were more likely to report higher burnout composite scores,(68) but results did not generalise in a further study.(69) One study found working that overtime was associated with composite MBI score.(73) On-call requirement was not significantly associated with any MBI dimensions.(71)

Number of hours worked per week was not a significant predictor of burnout according to two studies,(25, 53) but having higher number of weekly hours was associated with Emotional Exhaustion and Depersonalisation in one study.(70) Long shifts of 12 hours or more were associated with all MBI subscales,(74) and with Emotional Exhaustion.(49, 75) A study using the ProQol5 burnout scale found that shorter shifts were protective of burnout.(25)

Having higher schedule flexibility was protective of Emotional Exhaustion;(46) and so was the ability to schedule days off for a burnout composite score.(76) Having more than eight days off per month was associated with lower burnout.(69) Stone et al found that a positive scheduling climate was protective of Emotional Exhaustion only.(77)

In summary, we found an association between ≥12-hour shifts and Emotional Exhaustion, and between schedule flexibility and reduced Emotional Exhaustion.

## Psychological Demands and Job Complexity

There is evidence from 24 studies that job demands and aspects intrinsic to the job, including role conflict, autonomy, and task variety are associated with some burnout dimensions.

Eight studies considered psychological demands. The higher the psychological demands, the higher the likelihood of experiencing all burnout dimensions;(72) and high psychological demands were associated with higher odds of Emotional Exhaustion.(62, 78) Emotional demands, in terms of hindrances, had an effect on burnout.(67) One study reported that job demands, measured with the effort-reward imbalance questionnaire, were correlated with all burnout dimensions,(79) and similarly Garcia-Sierra et al found that demands predict burnout, measured with a composite scale of Emotional Exhaustion and Cynicism.(80) According to one study, job demands were not associated with burnout,(73) and Rouxel concluded that the higher the job demands, the higher the impact on both Emotional Exhaustion and Depersonalisation.(64)

Four studies looked at task nature and variety; quality of job content, in terms of skill variety, skill discretion, task identity, task significance, influenced Emotional Exhaustion through intrinsic work motivation.(37) Skill variety and task significance were related to Emotional Exhaustion; task significance was also related to Personal Accomplishment.(60) Having no administrative tasks in the job was associated with a reduced likelihood to experience Depersonalisation.(71) Higher task clarity was associated with reduced levels of Emotional Exhaustion and increased Personal Accomplishment.(58)

Patient characteristics/requirements were investigated in four papers. When nurses were caring for suffering patients and patients who had multiple requirements, they were more likely to experience Emotional Exhaustion and Cynicism. Similarly, caring for a dying patient and having a high number of decisions to forego life-sustaining treatments was associated with a higher likelihood of burnout (measured with a composite score).(76) Stress resulting from patient care was associated with a composite burnout score.(73) Patient violence also had an impact on burnout, measured with CBI,(81) as did conflict with patients.(76)

Role conflict is a situation in which contradictory, competing, or incompatible expectations are placed on an individual by two or more roles held at the same time. Role conflict predicted Emotional Exhaustion,(41) and so it did in a study by Konstantinou, who found that role conflict was associated with Emotional Exhaustion and Depersonalisation;(34) Levert and colleagues reported that role conflict correlated with Emotional Exhaustion, Depersonalisation, and Personal Accomplishment. They also considered role ambiguity, which correlated with Emotional Exhaustion and Depersonalisation, but not Personal Accomplishment.(39) Andela et al investigated the impact of emotional dissonance, defined as the mismatch between the emotions that are felt and the emotions required to be displayed by organizations. They reported that emotional dissonance is a mediator between job aspects (i.e. workload, patient characteristics, and team issues) and Emotional Exhaustion and Cynicism. Rouxel found that perceived negative display rules were associated with Emotional Exhaustion.(64)

Autonomy related to Emotional Exhaustion and Depersonalisation,(60) and in another study it only related to Depersonalisation.(43) Low autonomy impacted Emotional Exhaustion via organizational trust (82) Autonomy correlated with burnout.(67) There was no effect of autonomy on burnout according to two studies.(58, 63)Low decision-making at the ward level was associated with all MBI subscales.(77) Decision latitude impacted Personal Accomplishment only,(36) and in one study it was found to be related to Emotional Exhaustion.(78) High decision latitude was associated with Personal Accomplishment (41) and low Emotional Exhaustion.(33)

Overall, high job and psychological demands were associated with Emotional Exhaustion, as was role conflict. Patient complexity was associated with burnout, while task variety, autonomy and decision latitude were protective of burnout.

## Working Relationships and Leadership

Overall, evidence from 39 studies supports that having positive support factors and working relationships in place, including positive relationships with physicians, support from the leader, positive leadership style, and teamwork, might play a protective role towards burnout.

The quality of relationship with physicians was investigated by 12 studies. In two studies having negative relationships with physicians was associated with all MBI dimensions; (77, 83) Quality of nurse-physician relationship was associated with Emotional Exhaustion and Depersonalisation, but not PA.(50) Two studies found an association with Emotional Exhaustion only,(55, 84) and one concluded that quality of relationship with physicians indirectly supported PA.(36) This was also found by Leiter and Laschinger, who found that positive nurse-physician collaborations predicted Personal Accomplishment.(57, 85) When burnout was measured with composite scores of MBI and a not validated scale, two studies reported an association with nurse-physician relationship,(20, 76) and two studies found no associations.(56, 63)

Having support from the supervisor or leader was considered in 12 studies, which found relationships with different MBI dimensions. A relationship between low support from nurse managers and all MBI subscales was observed in one study,(77) while two studies reported it is a protective factor from Emotional Exhaustion only,(58, 83) and one that it was also associated with Depersonalisation,(86). Kitaoka-Higashiguchi reported an association only with Cynicism,(41) and Jansen found it was only associated with Depersonalisation and Personal Accomplishment.(60) Van Bogaert and colleagues found that support from managers predicted low Emotional Exhaustion and high Personal Accomplishment,(84), but in a later study it only predicted high Personal Accomplishment.(36) Regarding the relationship with manager, it had a direct effect on Depersonalisation, and it moderated the effect of time pressure on Emotional Exhaustion and Depersonalisation;(59) a protective effect of a quality relationship with the head nurse on a composite burnout score was also reported.(76) Two studies using different burnout scales found an association between manager support and reduced burnout.(25, 67) Low trust in the leader showed a negative impact on burnout, measured with a composite score.(87) Two further studies focused on the perceived nurse manager’s ability: authors found that it was related to Emotional Exhaustion,(46) and Emotional Exhaustion and Personal Accomplishment.(50)

Fourteen studies looked at leadership style, and found that it affects burnout through different pathways and mechanisms. Boamah et al found that authentic leadership – described as leaders who have high self-awareness, balanced processing, an internalised moral perspective, and transparency – predicted higher empowerment, which in turn predicted lower levels of Emotional Exhaustion and Cynicism a year later.(54). Authentic leadership had a negative direct effect on workplace bullying, which in turn had a direct positive effect on Emotional Exhaustion.(88) Effective leadership predicted staffing adequacy, which in turn predicted Emotional Exhaustion.(57, 85) Authentic leadership predicted all areas of worklife, which in turn predicted all MBI dimensions of burnout,(30) and a similar pathway was identified by Laschiner and Read, although authentic leadership impacted Emotional Exhaustion only and it was also through civility norms and co-worker incivility.(31) Emotional Exhuastion mediated the relationship between authentic leadership and intention to leave the job.(89) “Leader empowering behaviour” had an indirect effect on Emotional Exhaustion through structural empowerment,(29) and empowering leadership predicted trust in the leader, which in turn was associated with burnout composite score.(87) Active management-by-exception was beneficial for Depersonalisation and Personal Accomplishment, passive laissez-faire leadership negatively affected Emotional Exhaustion and Personal Accomplishment, and rewarding transformational leadership protected from Depersonalisation.(90) Contrary to this, Madathil et al found that transformational leadership protected against Emotional Exhaustion, but not Depersonalisation, and promoted Personal Accomplishment.(43) Transformational leadership predicted positive work environments, which in turn predicted lower burnout (composite score).(44) Positive leadership affected Emotional Exhaustion and Depersonalisation (56) and burnout measured with a non-validated scale.(20)

Teamwork and social support were also explored. Co-worker cohesion was only related to Depersonalisation;(58) team collaboration problems predicted negative scores on all MBI subscales,(38) and workplace support protected from Emotional Exhaustion.(72) Similarly, support received from peers had a protective effect on Emotional Exhaustion.(60) Collegial support was related to Emotional Exhaustion and Personal Accomplishment (39), and colleague support protected from burnout.(67) Interpersonal conflict affected Emotional Exhaustion through role conflict, but co-worker support had no effect on any burnout dimensions(41), and similarly co-worker incivility predicted Emotional Exhaustion,(31) and so did bullying.(88) Poor team communication was associated to all MBI dimensions,(40) staff issues predicted burnout measured with a composite score,(73) and so did verbal violence from colleagues.(68) One study found that seeking social support was not associated with any of the burnout dimensions, while another study found that low social support predicted Emotional Exhaustion,(37) and social support was associated with lower Emotional Exhaustion and higher Personal Accomplishment.(21) Vidotti et al found an association between low social support and all MBI dimensions.(62)

## Work Environment and Hospital Characteristics

Eleven studies considering work environment measured with the PES-NWI scale (91), where higher scores indicate positive work environments. Five studies comprising of diverse samples and settings concluded that the better rated the work environment, the lower the likelihood of experiencing Emotional Exhaustion,(32, 47, 49, 51, 92) and four studies found the same relationship, but on both Emotional Exhaustion and Depersonalisation;(50, 66, 93) (94) only one study concluded there is an association between work environment and all MBI dimensions.(95) Negative work environments affected burnout (measured with a composite score) via job dissatisfaction.(96) One study looked at organisational characteristics on a single scale, and found that a higher rating of organisational characteristics predicted lower Emotional Exhaustion.(82) Environmental uncertainty was related to all MBI dimensions.(86)

Structural empowerment was also considered in relation to burnout: high structural empowerment led to lower Emotional Exhaustion and Cynicism via staffing levels and work life interference;(54) in a study using a similar methodology, structural empowerment affected Emotional Exhaustion via Areas of Worklife.(29) The relationship between Emotional Exhaustion and Cynicism was moderated by organisational empowerment,(40) and organisational support had a protective effect on burnout.(67) Hospital management and organisational support had a direct effect on Emotional Exhaustion and Personal Accomplishment.(84) Trust in the organisation predicted lower levels of Emotional Exhaustion (82) and of burnout measured with a composite MBI score.(87)

Three studies considered whether policy involvement had an effect on burnout. Two studies on the same sample found that having the opportunity to participate in policy decisions was associated with reduced burnout (all subscales),(57, 85) and one study did not report results for the association.(20) Emotional Exhaustion mediated the relationship between nurses’ participation in hospital affairs and their intention to leave the job;(97) a further study did not found an association between participation in hospital affairs and Emotional Exhaustion, but only with Personal Accomplishment.(50) Lastly, one study investigated participation in research groups and concluded it was associated with reduced burnout measured with a composite score.(76)

There was an association between opportunity for career advancement and all MBI dimensions;(77) however, another study found that having promotion opportunities was not related to burnout.(79) Moloney et al found that professional development was not related to burnout.(67) Two studies considered pay. In one study, no effect was found on any MBI dimension,(73) and a very small study (n=78 nurses) reported an effect of satisfaction with pay on Emotional Exhaustion and Depersonalisation.(34) Job insecurity predicted Depersonalisation and PA.(79)

When the hospital adopted nursing models of care rather than medical models of care, nurses were more likely to report high levels of Personal Accomplishment.(57, 85) However, another study found no significant relationship.(20) Regarding ward and hospital type, Aiken and Sloane found that RNs working in specialised AIDS units reported lower levels of Emotional Exhaustion;(98) however ward type was not found to be significantly associated with burnout in a study on temporary nurses.(53) Working in different ward settings was not associated with burnout, but working in hospitals as opposed to in primary care was associated with lower Emotional Exhaustion.(71) Working in a small hospital was associated with a lower likelihood of Emotional Exhaustion, when compared to working in a community hospital.(63) Faller’s study also concluded that the working in California was a significant predictor of reduced burnout.

When the hospitals’ investment in quality of care was considered, one study found that having foundations for quality of care was associated with reduced Emotional Exhaustion only,(50) but in another study foundations for quality of care were associated with all MBI dimensions.(83) Working in a Magnet hospital was not associated with burnout.(53)

In summary, having a positive work environment (generally work environments scoring higher on the PES-NWI scale) was associated with reduced Emotional Exhaustion, and so was higher structural empowerment. However, none of the organisational characteristics at the hospital level were consistently associated with burnout.

## Staff Outcomes and Job Performance

Nineteen studies considered the impact of burnout on intention to leave. Two studies found that Emotional Exhaustion and Cynicism had a direct effect on turnover intentions,(28, 99) and four studies reported that only Emotional Exhaustion affected intentions to leave the job,(21, 32, 37, 100), with one of these indicating that Emotional Exhaustion affected also intention to leave the organisation,(32) but one study did not replicate such findings(101) and concluded that only Cynicism was associated with intention to leave the job and nursing. Similarly, one study found that Cynicism was directly related to intention to leave.(35) A further study found that Emotional Exhaustion affected turnover intentions via job satisfaction,(88) and one article reported that Emotional Exhaustion mediated the effect of authentic leadership on intention to leave.(89) Emotional Exhaustion was a mediator between nurses’ involvement with decisions and intention to leave the organisation.(97) Burnout measured on a composite score was associated with higher intention to leave.(96) Laeeque et al reported that burnout, captured with CBI, related to intention to leave;(81) Estryn-Behar et al used the same scale to measure burnout, and found that high burnout was associated with higher intention to leave in all countries, except for Slovakia.(102) Burnout, measured with the Malach-Pines scale, was associated with intention to quit, and stronger associations were found for nurses who had higher perceptions of organisational politics.(103) Burnout (Malach Pines scale) predicted both the intention to leave the job and nursing.(67) Three studies investigated the relationship between burnout and intention to leave; one of these aggregated all job outcomes in a single variable (i.e. job satisfaction, intention to leave the hospital, applied for another job, and intention to leave nursing) and reported that Depersonalisation and Personal Accomplishment predict job outcomes;(84) they replicated a similar approach and found the same associations.(36) They later found that all MBI dimensions were associated with leaving the nursing profession.(104) Only one study in a sample of 106 nurses from one hospital found an association between Depersonalisation and turnover within 2 years.(105)

Two studies looked at the effect of burnout on job performance: one found a negative association between burnout (measured with CBI) and both task performance and contextual performance.(106) Only Emotional Exhaustion was associated with self-rated and supervisor-rated job performance of 73 RNs.(21) Missed care was investigated in three studies, and it was found to be a both predictor of Emotional Exhaustion,(32) an outcome of burnout.(20, 103)

Four studies considered sickness absence. When RNs had high levels of Emotional Exhaustion they were more likely to experience short-term sickness absence (i.e. 1-10 days of absence), which was obtained from hospital administrative records. Similarly, Emotional Exhaustion was associated with seven or more days of absence in a longitudinal study.(105) Emotional Exhaustion was significantly associated with reported mental health absenteeism, but not reported physical health absenteeism, and sickness absence from administrative records.(21) One study did not find any meaningful relationships between burnout and absenteeism.(107)

Emotional Exhaustion was a significant predictor of general health,(73) and in a further study both Emotional Exhaustion and Personal Accomplishment were associated with perceived health.(70) Final year nursing students who experienced health issues were more likely to develop high burnout when entering the profession.(26) When quality of sleep was treated both as a predictor and outcome of burnout, relationships were found in both instances.(106)

Focussing on mental health, one study found that burnout predicted mental health problems for newly qualified nurses,(30) and Emotional Exhaustion and Cynicism predicted somatisation.(42) Depressive symptoms were predictive of Emotional Exhaustion and Depersonalisation, considering therefore depression as a predictor of burnout.(108) Rudman and Gustavsson also found that having depressive mood and depressive episodes were common features of newly qualified nurses who developed or got worse levels of burnout throughout their first years in the profession.(26) Tourigny considered depression as a predictor, and found it was significantly related to Emotional Exhaustion.(107)

Eleven studies considered job satisfaction: of these, three treated job satisfaction as a predictor of burnout, and concluded that higher levels of job satisfaction were associated with lower level of composite burnout scores (52, 96) and all MBI dimensions.(94) According to two studies, Emotional Exhaustion and Cynicism predicted job dissatisfaction,(54, 101) while four studies reported that Emotional Exhaustion only was associated with increased odds to report job dissatisfaction (73, 82, 88, 100); one study reported that Cynicism only was associated with job dissatisfaction.(99) Rouxel et al did not find support in their hypothesised model that Emotional Exhaustion and Depersonalisation predicted job satisfaction.(64)

In summary, considering 39 studies, there is conflicting evidence on the direction of the relationship between burnout and missed care, mental health, and job satisfaction. An association between burnout and intention to leave was found, although only one small study reported an association between burnout and turnover. A moderate relationship was found for the effect of burnout on sickness absence, job performance, and general health.

## Patient Care and Outcomes

Among the patient outcomes of burnout, quality of care was investigated by eight studies. Two studies in diverse samples and settings reported that high Emotional Exhaustion, high Depersonalisation and low Personal Accomplishment were associated with poor quality of care,(109, 110) but one study found that only Personal Accomplishment was related to better quality of care at the last shift.(104) Emotional Exhaustion and Cynicism predict low quality of care;(54) two articles reported that Emotional Exhaustion predicts poor nurse ratings of quality of care,(82, 84). A high burnout composite score predicted poor nurse-assessed quality of care.(96) In one instance, no associations were found between any of the burnout dimensions and quality of care.(36)

Five studies considered aspects of patient safety: burnout was correlated with negative patient safety climate;(111) Emotional Exhaustion and Depersonalisation were both associated with negative patient safety grades and safety perceptions,(112) and burnout fully mediated the relationship between depression and individual-level safety perceptions and work area/unit level safety perceptions.(108) Emotional Exhaustion mediated the relationship between workload and patient safety,(51) and a higher composite burnout score was associated with lower patient safety ratings.(113)

Regarding adverse events, high DEP and low Personal Accomplishment predicted a higher rate of adverse events(85), but in another study only Emotional Exhaustion predicted adverse events.(51) When nurses were experiencing high levels of Emotional Exhaustion, they were less likely to report near misses and adverse events, and when they were experiencing high levels of Depersonalisation, they were less likely to report near-misses.(112)

All three MBI dimensions predicted medication errors in one study,(109) but Van Bogaert et al found that only high levels of Depersonalisation were associated with medication errors.(104) High scores in Emotional Exhaustion and Depersonalisation predicted infections.(109) Cimiotti et al found that Emotional Exhaustion was associated with catheter-associated urinary tract infections and surgical site infections,(114) while in another study Depersonalisation was associated with nosocomial infections.(104) Lastly, patient falls were also explored and Depersonalisation and low Personal Accomplishment were significant predictors in one study,(109) while in a further study only Depersonalisation was associated with patient falls.(104) There was no association between burnout and hospital-acquired pressure ulcers.(20)

Considering patient experience, Vahey et al concluded that higher Emotional Exhaustion and low Personal Accomplishment levels were associated with patient dissatisfaction,(93) and Van Bogaert 2014 found that Emotional Exhaustion was related to patient and family verbal abuse, and Depersonalisation was related to both patient and family verbal abuse and patient and family complaints.(104)

In summary, evidence deriving from 17 studies points to a negative effect of burnout on quality of care, patient safety, adverse events, error reporting, medication error, infections, patient falls, patient dissatisfaction, and family complaints, but not on pressure ulcers.

## Individual Characteristics

In total, 16 studies, which had examined work characteristics related to burnout, also considered the relationship between characteristics of the individual and burnout. Relationships were tested on demographic variables, including gender, age, family status; on personality aspects; on work-life interference and on professional attributes including length of experience and educational level. Because our focus on burnout is as a job-related phenomenon, we have not reported results of these studies into detail, but overall evidence on demographic and personality factors was inconclusive, and having family issues and high work-life interference were associated with different burnout dimensions. Being younger and not having a Bachelor degree were found to be associated with higher incidence of burnout.

# DISCUSSION

This review aimed to identify research that had examined theorised relationships with burnout, in order to determine what is known (and not known) about factors associated with burnout in nursing, and to determine the extent to which studies have been underpinned by, and/or have supported or refuted, theories of burnout. We found that the associations hypothesised by Maslach’s theory between mismatches in areas of work life and burnout were generally supported.

Research consistently found that adverse job characteristics - high workload, low staffing levels, long shifts, low control, low schedule flexibility, time pressure, high job & psychological demands, low task variety, role conflict, low autonomy, negative nurse-physician relationship, poor supervisor/leader support, poor leadership, negative team relationship, job insecurity were associated with burnout in nursing.

However few studies used all three MBI subscales in the way intended, and nine used different approaches to measuring burnout.

The field has been dominated by cross-sectional studies that seek to identify associations with one or two factors, rarely going beyond establishing correlation. Most studies were limited by their cross sectional nature, the use of different or incorrectly applied burnout measures, the use of common methods (i.e. survey to capture both burnout and correlates), and omitted variables in the models. The 91 studies reviewed, whilst highlighting the importance of burnout as a feature affecting nurses and patient care, have generally lacked a theoretical approach, or identified mechanisms to test and develop theory on the causes and consequences of burnout, but were limited in their testing of likely mechanisms due to cross-sectional and observational designs.

For example, 19 studies showed relationships between burnout and job satisfaction, missed care, and mental health. But whilst some studies treated these as *predictors* of burnout, others handled as *outcomes* of burnout. This highlights a further issue that characterises the burnout literature in nursing: the simultaneity bias, due to the cross-sectional nature of the evidence. The inability to establish a temporal link means limits the inference of causality (115) Thus a factor such as, ‘missed care’ could lead to a growing sense of compromise and “crushed ideals” in nurses,(116) which causes burnout. Equally, it could be that job performance of nurses experiencing burnout is reduced, leading to increased levels of ‘missed care’. Both are plausible in relation to Maslach’s original theory of burnout, but research is insufficient to determine which is most likely, and thereby develop the theory.

To help address this, three areas of development within research are proposed. Future research adopting longitudinal designs that follow individuals over time would improve the potential to understand the direction of the relationships observed. Research using Maslach’s theory should use and report all three MBI dimensions; where only the Emotional Exhaustion subscale is used, this should be explicit and it should not be treated as being synonymous to burnout. Finally, to move our theoretical understanding of burnout forward, research needs to prioritise the use of empirical data on employee behaviours (such as absenteeism, turnover) rather than self-report intentions or predictions.

Addressing these gaps would provide better evidence of the nature of burnout in nursing, what causes it and its potential consequences, helping to develop evidence-based solutions and motivate work-place change. With better insight, health care organisations can set about reducing the negative consequences of having patient care provided by staff whose work has led them to become emotionally exhausted, detached and less able to do the job; that is, burnout.

## Limitations

Our theoretical review of the literature aimed to summarise information from a large quantity of studies; this meant that we had to report studies without describing their context in the text, and also without providing estimates (i.e. ORs and 95% CIs). In appraising studies, we did not apply a formal quality appraisal instrument, although we noted key omissions of important details. However, the results of the review serve to illustrate the variety of factors that may influence/result from burnout and demonstrate where information is missing. We did not consider personality and other individual variables when extracting data from studies. However, Maslach and Leiter recently reiterated that although some connections have been made between burnout and personality characteristics, the evidence firmly points toward work characteristics as the primary drivers of burnout.(8)

Whilst we used a reproducible search strategy searching MEDLINE, CINAHL, and PsycINFO, it is possible that there are studies indexed elsewhere and we did not identify them, and we did not include grey literature. It seems unlikely that these exist in sufficient quantity to substantively change our conclusions.

# CONCLUSION

Patterns identified across 91 studies consistently show that adverse job are associated with burnout in nursing. The potential consequences for staff and patients are severe. Maslach’s theory offers a plausible mechanism to explain the associations observed. However incomplete measurement of burnout and limited research on some relationships means that the causes and consequences of burnout cannot be reliably identified and distinguished, which makes it difficult to use the evidence to design interventions to reduce burnout.

# LIST OF ABBREVIATIONS

MBI: Maslach Burnout Inventory

CBI: Copenhagen Burnout Inventory

ProQOL5: Professional Quality of Life Measure

# DECLARATIONS

## **Ethics approval and consent to participate**

Not applicable

## **Consent for publication**

Not applicable

## **Availability of data and materials**

Not applicable

## **Competing interests**

The authors declare that they have no competing interests

## **Funding**

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## **Authors' contributions**

CDO led the paper write-up at all stages; designed and conducted the search strategy; completed initial screening of papers; co-developed the coding frame; applied the coding frame to all studies. JB conceived the review; co-developed the coding frame; applied the coding frame to all studies, contributed substantially to drafting the paper at various stages. MR extracted all the data from studies and produced evidence tables. PG conceived the review, contributed substantially to drafting the paper at various stages. All authors read and approved the final manuscript.

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## TABLES

Table 1 Studies' settings, sample sizes, burnout and correlates measurement, and appraisal of quality

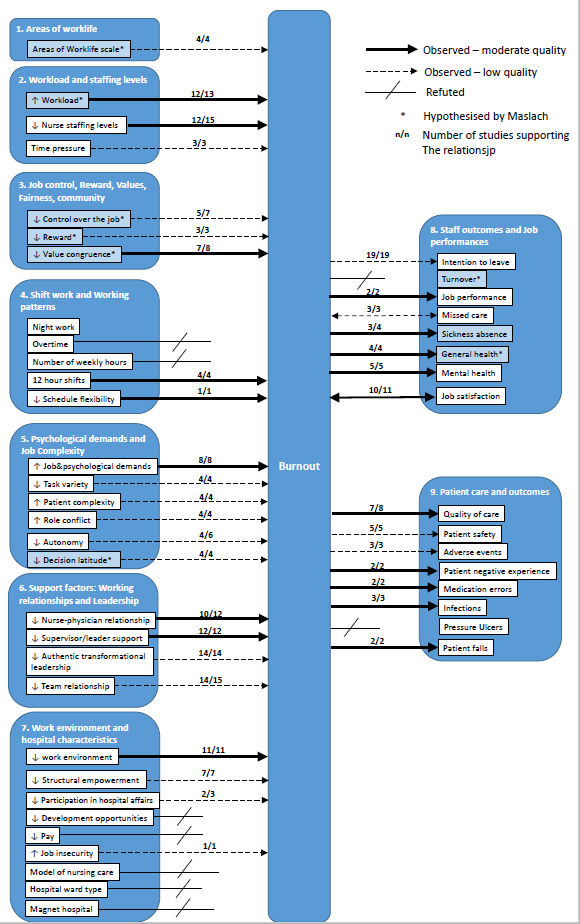
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Author, Year | Country | Setting | Sample Size | Staff group | Measure of burnout | Variables (measures) | Generalisable sample \* | Common methods variance\*\* | Clustering\*\*\* | Statistical adjustment\*\*\*\* |
| Adali et al, 2003 | Greece | Hospital – specialty  (Psychiatry) | 199 nurses, 5 hospitals | Nursing personnel in psychiatric hospitals | MBI | **Predictors (Moos Work Environment Scale):**   * Co-worker cohesion * Supervisor support * Autonomy * Task orientation * Work pressure   Clarity | N | Y | N | N |
| Anagnostopoulos and Niakas, 2010 | Greece | Hospital - all wards | 487 RNs, 4 hospitals | RNs with direct patient care and full time employment | MBI | **Outcomes:**  Short-term sickness absence (HR records) | N | N | N | N |
| Aiken et al, 2008 | US | Hospital - all wards | 10184 RNs, 168 hospitals | RNs | MBI (EE) | **Predictors:**   * Patient Care environment (PES-NWI)   Nurse staffing levels: mean patients/nurse (study questionnaire) | Y | Y | Y | Y |
| Aiken and Sloane, 1997 | US | Hospital – specialty  (AIDS) | 820 RNs, 20 hospitals | RNs | MBI (EE) | **Predictors:**  Type of hospital: presence/absence of specialised AIDS units (administrative data) | Y | N | N | Y |
| Aiken et al, 2002 | US | Hospital - all wards | 10184 RNs, 210 hospitals | RNs | MBI (EE) | **Predictors:**  Nurse staffing levels: patient-to-nurse ratio (nurse survey) | Y | Y | Y | Y |
| Akman et al, 2016 | Turkey | Hospital – specialty  (Paediatric) | 165 RNs, 10 clinics, 4 hospitals | Paediatric RNs | MBI (composite in regression) | **Predictors:**   * Nurse staffing levels: number of patients taken care of during daytime (socio-demographic form)   Job satisfaction (Minnesota job satisfaction scale) | N | Y | N | N |
| Andela et al, 2016 | Country not reported | Hospital - all wards | 445 healthcare workers, 1 hospital | RNs, health care assistants | MBI (PA dropped because NS) | **Predictors:**   * Patients’ and relatives’ requirements (Work Stress Inventory for Nurses in Oncology – WSINO) * Patients’ suffering (WSINO) * Workload (WSINO) * Team collaboration problems (WSINO)   Emotional dissonance (authors developed scale) | N | Y | N | Y |
| Anwar and Elareed, 2017 | Egypt | Hospital - all wards | 286 RNs, 1 hospital | RNs | MBI-HSS (composite in regression) | **Predictors (study questionnaire):**   * Number of shifts * Type of violence (from staff – verbal or emotional)   Shift timing | N | Y | N | N |
| Bagheri Hosseinabadi et al, 2019 | Iran | Hospital - all wards | 682 nurses, 4 teaching hospitals | Nurses | MBI-GS (both separate scales and composite measure) | **Predictors:**   * Age (demographic questionnaire) * Gender (demographic questionnaire) * Marital status (demographic questionnaire) * Length of experience (demographic questionnaire) * Irregular shifts (demographic questionnaire) * Psychological demand (Persian Job Content Questionnaire)   Workplace support (Persian Job Content Questionnaire) | N | Y | N | Y |
| Basar and Basim, 2016 | Turkey | Hospital - all wards | 456 RNs, 6 hospitals | RNs | Malach-Pines Burnout measure scale (BMS-10) | **Outcomes:**   * Intention to quit (Walsh scale) * Perceptions of organizational politics (Hochwarter scale)   Neglect of work (Rusbult scale) | N | Y | N | N |
| Basinska and Wilczek-Ruzyczka, 2013 | Poland | Hospital - general | 263 RNs | RNs | MBI | **Predictors:**   * Job demands (Effort-Reward Imbalance questionnaire)   Rewards: esteem, job promotion and salary, job security (Effort-Reward Imbalance questionnaire) | N | Y | N | N |
| Boamah and Laschinger, 2016 | Canada | All settings | 215 RNs | Newly graduated nurses (RNs) | MBI (EE and CYN) | **Predictors**:   * Areas of work-life (Areas of Worklife Scale) * Work-life interference (Work Interference with Personal Life scale)   **Outcomes**:  Intention to leave (Turnover Intentions scale) | N | Y | N | N |
| Boamah et al, 2017  *Time-lagged study* | Canada | All settings | 1021 RNs at time 1; 406 at time 2 | Newly graduated nurses (RNs) | MBI (EE and CYN) | **Predictors:**   * Authentic leadership (Authentic Leadership Questionnaire) * Structural empowerment (Conditions of Work Effectiveness-II) * Short staffing (study questionnaire) * Work-life interference (Work Interference with Personal Life scale)   **Outcomes:**   * Job satisfaction (Michigan Assessment of Organisations questionnaire)   Nurse-assessed quality of care (study questionnaire) | N | Y | N | N |
| Bobbio et al, 2012 | Italy | Hospital - all wards | 273 RNs, 1 hospital | RNs | MBI-GS (composite) | **Predictors (study questionnaire):**   * Empowering leadership * Trust in the leader   Trust in organization | N | Y | N | N |
| Bourbonnais et al, 1998  *Longitudinal* | Canada | Hospital - all wards | 1891 RNs, 6 hospitals | RNs | MBI (EE) | **Predictors (study questionnaire)**:   * Psychological demands   Decision latitude | Y | Y | N | Y |
| Cañadas-De la Fuente et al, 2015 | Spain | Primary Care and Community | 676 RNs | RNs | MBI | **Predictors:**   * Level of healthcare: hospital, primary (study questionnaire) * Healthcare service area (study questionnaire) * Job shift (study questionnaire) * On call requirement (study questionnaire) * Administrative tasks (study questionnaire) * Seniority in current job and profession (study questionnaire) * Neuroticism (NEO-FFI) * Agreeableness (NEO-FFI)   Extraversion (NEO-FFI) | Y | Y | N | Y |
| Cao and Naruse, 2019 | Japan | Primary Care and Community | 93 nurses | Licenced nurses working for agency | Japanese Burnout Inventory (EE, DEP) | **Predictors:**   * Time pressure (study questionnaire)   Relational Coordination with nurse managers (Relational Coordination Scale) | N | Y | N | Y |
| Cimiotti et al, 2012 | US | Hospital - all wards | 7076 RNs, 161 hospitals | RNs | MBI (EE) | **Outcomes:**   * Catheter-associated urinary tract infections (PHC4)   Surgical site infections (PHC4) | Y | N | N | Y |
| Colindres et al, 2018 | Ecuador | Hospital - all wards | 333 nurses from 4 hospitals | Nurses (auxiliary, general or specialized) | Copenhagen Burnout Inventory (CBI) | **Predictors:**   * Effort/reward imbalance (ERI questionnaire)   Adherence to infection prevention and control (Johns Hopkins University School of Hygiene and Public Health Safety Climate Questionnaire) | N | Y | N | N |
| Dall’Ora et al, 2015 | RN4CAST (12 EU countries) | Hospital - general | 31627 RNs, 2170 units, 488 hospitals | RNs | MBI | **Predictor:**  Shift length (study questionnaire) | Y | Y | Y | Y |
| Dhaini et al, 2018 | Switzerland | Hospital - all wards | 1833 RNs, 23 hospitals, 124 units, | RNs | MBI (EE) | **Predictors:**   * Work schedule flexibility (study questionnaire) * Perceived nurse manager ability (PES-NWI) * Work family conflict (Work-Family Conflict scale) * Familial status (study questionnaire)   Workload: number of patients to care for (study questionnaire) | Y | Y | Y | Y |
| Dutra et al, 2018 | Brazil | Hospital - all wards | 3 hospitals, 450 nurses | RNs and nurse technicians | MBI-HSS (only EE) | **Outcomes:**   * Job dissatisfaction (Safety Attitudes Questionnaire)   Intent to leave (Study questionnaire) | N | Y | N | Y |
| Estryn-Béhar et al, 2007 | NEXT (10 EU countries) | Hospital - all wards | 28561 RNs | RNs | CBI | **Outcome:**  Intention to leave (Study questionnaire) | Y | Y | Y | Y |
| Faller et al, 2011 | US | Hospital - all wards | 976 RNs | Travel RNs (temporary nurses) | CBI | **Predictors (Study questionnaire):**   * Age * Gender * Race * Married * Children at home * Education level * Years of experience as RN * Years of experience as traveller * Hours worked per week * Staffing levels: number of patients per shift * Ward type * Magnet   Location of facility | N | Y | N | N |
| Firth and Britton, 1989  *Longitudinal* | UK | Hospital - general | 106 nurses | Qualified nursing staff | MBI | **Outcomes (Study questionnaire):**   * Episodes of absence   Turnover | N | Y | N | N |
| Flynn et al, 2009 | US | Primary Care and Community | 1,015 RNs | RNs in haemodialysis settings | MBI (EE) | **Predictors:**   * RN staffing levels: patient-to-nurse ratio (study questionnaire) * Workload (Individual Workload Perception Scale) * Practice environments (PES-NWI-R) * Impaired nursing care processes (study questionnaire)   **Outcomes**:   * Intention to leave current position (Study questionnaire)   Intention to leave current employer (Study questionnaire) | Y | Y | N | N |
| Galletta et al, 2016 | Italy | Hospital - all wards | 307 RNs, 1 hospital, 24 units | RNs | 16-items MBI | **Predictors:**   * Organisational empowerment (Conditions of Work Effectiveness Questionnaire-II) * Workload (Areas of Worklife Scale – AWS) * Job control (AWS)   Team quality (modified ICU questionnaire) | N | Y | N | Y |
| Gandi et al, 2011 | Nigeria | Hospital - all wards | 2245 RNs | RNs | MBI | **Predictors:**   * Workload (Job autonomy questionnaire) * Job control (Inventory of Feelings of Motivation and Demotivation) * Work-home interference (study questionnaire)   Home-work interference (study questionnaire) | N | Y | N | N |
| Garcia-Sierra et al, 2016 | Spain | Hospital - general | 100 RNs, 2 hospitals | RNs | MBI (EE and CYN) | **Predictors**:   * Demands (Job Content Questionnaire)   Support (Job Content Questionnaire) | N | Y | N | Y |
| Garrett and McDaniel, 2001 | US | Hospital - all wards | 77 RNs, 1 hospital, 5 units | RNs | MBI | P**redictors:**   * Environmental uncertainty (Perceived environmental uncertainty Scale)   Social climate: Supervisor Support and Peer cohesion (Work Environment Scale) | N | Y | N | N |
| Giorgi et al, 2018 | Italy | Hospital - all wards | 315 RNs, 39 units, 7 hospitals | RNs | CBI | **Predictors**:   * Quality of sleep (Pittsburgh Sleep Quality Index)   **Outcomes:**   * Quality of Sleep   Job performance (Job performance scale: Task performance and contextual performance) | Y | Y | N | Y |
| Greco et al, 2006 | Canada | Hospital - all wards | 322 RNs | RNs | MBI (EE) | **Relationships:**   * Leader empowering behaviours (Leader Empowering Behaviour Scale) * Structural empowerment (Conditions of Work Effectiveness Questionnaire–II)   Areas of work-life (Areas of Worklife Scale) | N | Y | N | N |
| Greenglass, 2001 | Canada | Hospital - all wards | 1363 nurses, 11 nursing units | Nurses employed in hospitals undergoing restructuring | MBI-GS | **Predictor:**   * Workload (study questionnaire)   **Outcome:**  Somatization (Hopkins Symptom Checklist) | Y | Y | N | N |
| Halbesleben et al, 2008 | US | Hospital - all wards | 148 Nurses, 1 hospital | RNs, Licenced Practice Nurses, Nurse Practitioners | MBI (EE and DEP) | **Outcomes (AHRQ Patient Safety Culture Survey)**:   * Patient safety grade * Safety perceptions * Event reports   Near-miss frequency reporting | N | Y | N | Y |
| Hanrahan et al, 2010 | US | Hospital – specialty  (Psychiatry) | 353 RNs, 67 hospitals | Psychiatric RNs | MBI | **Predictors:**   * Practice Environment (PES-NWI) * Nurse Participation in Hospital Affairs (PES-NWI) * Foundations for Quality of Care (PES-NWI) * Manager Skill and Leadership (PES-NWI) * Nurse-Physician Relationship (PES-NWI)   Nurse Staffing: Patient to Nurse Ratio (study questionnaire) | Y | Y | N | Y |
| Hunsaker et al, 2015 | US | Hospital - critical care/ED | 278 RNs | Emergency Department RNs | ProQol 5 (Burnout subscale) | **Predictors (study questionnaire)**:   * Level of education * Years in profession * Hours of work per week * Shift length * Years as an ED nurse   Manager support | N | Y | N | Y |
| Ilhan et al, 2008 | Turkey | Hospital - all wards | 418 RNs, 1 hospital | RNs | MBI | **Predictors (study questionnaire):**   * Number of years in nursing * Weekly work duration * Shift-working * Workload * Perceived health * Personal difficulties   Financial difficulties | N | Y | N | N |
| Jansen et al, 1996 | The Netherlands | Primary Care and Community | 441 nurses | Community RNs and auxiliaries | MBI-NL (Dutch version) | **Predictors (Algera questionnaire):**   * Time pressure * Autonomy * Task clarity * Skill variety * Growth at work * Feedback * Task significance * Active approach * Passive approach * Seeking social support * Support received from head nurse   Support received from peers | N | Y | N | Y |
| Janssen et al, 1999 | The Netherlands | Hospital - all wards | 156 RNs | RNs, head nurses, nurse aids | MBI (EE) | **Predictors (Study questionnaire):**   * Quality of job content * Mental work overload * Social support * Unmet career expectations   **Outcomes:**   * Intrinsic work motivation (Warr scale)   Turnover iteration (study questionnaire) | N | Y | N | N |
| Johnson et al, 2017 | UK | Hospital - all wards | 232 nursing staff, 3 hospitals | RNs, healthcare assistants | MBI (EE and DEP) | **Predictors:**   * Depressive symptoms (Depression, Anxiety and Stress scale)   **Outcomes (AHRQ Hospital Survey on Patient Safety Culture):**   * Individual level safety perception   Work area/unit level safety perceptions | N | Y | Y | Y |
| Kanai-Pak et al, 2008 | Japan | Hospital - all wards | 5956 staff nurses, 302 units, 19 hospitals | Staff nurses | MBI (EE) | **Predictors**:   * Inexperienced nurses (study questionnaire) * Staffing-resources adequacy (NWI-R)   Nurse physician relations (NWI-R) | Y | Y | N | N |
| Kanste et al, 2007 | Finland | All settings | 601 RNs and nurse managers | RNs, specialist nurses, nurse managers | MBI-HSS | **Predictors (Multifactor Leadership Questionnaire):**   * Rewarding transformational leadership * Active management-by-exception   Passive laissez-faire leadership | N | Y | N | Y |
| Khamisa et al, 2016 | South Africa | Hospital - all wards | 277 nurses, 4 hospitals | Nurses | MBI-HSS (composite score in regression) | **Predictors:**   * Work related stress parameters: patient care, staff issues, job demands, overtime (Nursing Stress Inventory)   **Outcomes:**   * General health (General Health Questionnaire)   Job satisfaction: Pay, promotion, supervision, fringe benefits, operating conditions, contingent rewards, co-workers, nature of work, communication (Job Satisfaction Survey) | N | Y | N | N |
| Kitaoka-Higashiguchi, 2005 | Japan | Hospital - all wards | 238 nurses, 1 hospital | Nurses | MBI-GS | **Predictors:**   * Workload demand (Job Content Questionnaire) * Decision authority (Job Content Questionnaire) * Role conflict (NIOSH questionnaire) * Interpersonal conflict (NIOSH questionnaire)   Supervisor support and co-worker support (NIOSH) | N | Y | N | N |
| Klopper et al, 2012 | South Africa | Hospital - critical care/ED | 935 nurses, 42 hospitals | Critical care nurses | MBI | **Predictors:**   * Practice Environment (PES-NWI)   Job satisfaction (Study questionnaire) | Y | Y | N | N |
| Konstatinou et al, 2018 | Greece | Primary Care and Community | 78 nurses, 4 clinics | Mental health nurses | MBI | **Predictors:**   * Role conflict (Role Conflict Scale) * Training (Study questionnaire) * Pay (Study questionnaire) * Serious family issue (Study questionnaire)   Workload (Study questionnaire) | N | Y | N | N |
| Kowalski et al, 2010 | Germany | Hospital - all wards | 959 nurses, 4 hospitals | Nurses | MBI-GS (EE) | **Predictors:**   * Workload (Intensity of labour scale) * Decision latitude (Intensity of labour scale)   Social capital in the hospitals (Social capital in organisations) | Y | Y | N | Y |
| Laeeque et al, 2018 | Pakistan | Hospital - all wards | 216 nurses, 4 hospitals | Nurses | CBI | **Predictor:**   * Patient violence (Study questionnaire)   **Outcome:**  Intention to leave (Ganesan and Weitz scale) | N | Y | N | N |
| Laschinger et al, 2001 | Canada | Hospital - general | 3016 nurses, 135 hospitals | Staff nurses | MBI-HSS (EE) | **Predictors:**   * Organizational characteristics: autonomy, control, collaboration (NWI) * Organizational trust (Interpersonal Trust at Work Scale)   **Outcomes:**   * Job satisfaction (Study questionnaire)   Nurse-assessed quality (Study questionnaire) | Y | Y | N | N |
| Laschinger and Leiter, 2006 | Canada | Hospital - all wards | 8597 nurses | Hospital-based nurses | MBI | **Predictors (NWI-PES) :**   * Strong leadership * Policy involvement * RN/MD Collaboration * Staffing adequacy * Nursing of care   **Outcome:**  Adverse events (Study questionnaire) | Y | Y | N | N |
| Laschinger et al, 2009 | Canada | Hospital - all wards | 612 nurses, 5 hospitals | Nurses | MBI (EE and CYN) | **Outcomes:**   * Job satisfaction (Study questionnaire) * Organizational commitment (Affective Commitment Scale)   Turnover Intentions (Turnover Intentions measure) | Y | Y | N | N |
| Laschinger, 2012 | Canada | Hospital - all wards | 342 nurses | Newly graduate nurses | MBI (EE and CYN) | **Outcomes:**   * Job satisfaction (Satisfaction Scale) * Intention to leave the job (Turnover Intent scale) * Career satisfaction (Satisfaction Scale)   Intention to leave nursing (Turnover Intent scale) | N | Y | N | N |
| Laschinger et al, 2012 | Canada | Hospital - all wards | 342 nurses | Newly graduate nurses | MBI (EE) | **Predictors:**   * Authentic leadership (Authentic Leadership Questionnaire) * Workplace bullying (Negative Acts questionnaire)   **Outcomes:**   * Job satisfaction (Satisfaction Scale)   Turnover intentions (Turnover Intent scale) | N | Y | N | N |
| Laschinger et al, 2015 | Canada | Hospital - all wards | 1009 nurses | Newly graduate nurses | MBI | **Relationships:**   * Authentic leadership (Authentic Leadership Questionnaire) * Areas of work-life (Areas of Worklife Scale) * Occupational coping self-efficacy (Occupational Coping self-efficacy scale)   Mental health (General Health Questionnaire) | Y | Y | N | N |
| Laschinger and Read, 2016 | Canada | All settings | 993 nurses | New graduate nurses | MBI (EE) | **Relationships:**   * Authentic leadership (Authentic Leadership Questionnaire) * Areas of work life (Areas of Worklife Scale) * Civility norms (Civility Norms Questionnaire)   Coworker incivility (Straightforward Workplace Incivility Scale) | Y | Y | N | N |
| Lee et al, 2019 | Taiwan | Hospital - all wards | 946 nurses | Nurses – analysis broken down by seniority | MBI‐HSS (EE) | **Predictor:**   * Authentic leadership (Authentic Leadership Questionnaire)   **Outcome:**  Intention to leave (Intent-To-Leave job questionnaire) | Y | Y | N | N |
| Leineweber et al, 2014 | Sweden | Hospital - general | 8620 RNs, 53 hospitals, 369 departments, | RNs | MBI | **Predictors:**   * Work-family conflict (Study questionnaire) * Staff adequacy (PES-NWI) * Leadership and support for nurses (PES-NWI)   Nurse-physician relationship (PES-NWI) | Y | Y | Y | Y |
| Leiter and Laschinger, 2006 | Canada | Hospital - all wards | 8597 nurses | Nurses | MBI | **Relationships (PES-NWI):**   * Leadership * Policy involvement * RN/MD collaboration * Staffing adequacy   Nursing model of care | Y | Y | N | N |
| Leiter and Masclach, 2009 | Canada | All settings | 667 nurses | RNs, Licenced practical nurses, clinical nurse specialists, Clinical Nurse Educators, Nurse Practitioners | MBI-GS | **Predictors (Areas of Work Life scale):**   * Control * Workload * Community * Fairness * Reward * Value congruence   **Outcome:**  Turnover intentions (Turnover Intentions scale) | Y | Y | N | N |
| Levert et al, 2000 | South Africa | Hospital - specialty | 94 nurses, 4 hospitals | Psychiatric nurses | MBI | **Predictors:**   * Workload (Workload and Lack of Collegial Support scale) * Collegial support (Workload and Lack of Collegial Support scale) * Role conflict (Role Conflict and Role Ambiguity scale) * Role Ambiguity (Role Conflict and Role Ambiguity scale)   **Mediator:**  Sense of coherence (Orientation to Life Questionnaire) | N | Y | N | N |
| Li et al, 2013 | RN4Cast (11 EU countries) | Hospital - general | 23,446 RNs, 352 hospitals, 2087 units | RNs | MBI | **Predictors (PES-NWI):**   * Managerial support for nursing * Doctor-nurse collegial relations   Promotion of care quality | Y | Y | Y | Y |
| Liu and Aungsuroch, 2018 | China | Hospital - all wards | 510 nurses, 4 hospitals | Nurses | MBI-HSS (composite score) | **Relationships:**   * Work environment (Chinese-PES) * Patient-to-nurse ratio (Nurse Staffing Form) * Job satisfaction (Chinese Nurse Job Satisfaction Scale) * Nurse-assessed quality nursing care (Chinese Nurse Assessed Quality of Nursing Care Scale)   Intention to leave (Chinese Anticipated Turnover Scale) | N | Y | N | N |
| Liu et al, 2018 | China | Hospital - general | 1542 nurses, 23 hospitals, 111 units | Nurses | MBI-HSS (EE) | **Relationships:**   * Work environment (PES-NWI) * Workload (patient-nurse-ratio and non-professional tasks) * Patient safety (Study questionnaire)   Adverse events (Study questionnaire) | Y | Y | N | N |
| Lu et al, 2015 | China | Hospital - all wards | 856 nurses | Nurses | MBI (EE) | **Predictor:**  Patient-nurse ratio (Study questionnaire) | N | Y | N | Y |
| Madathil et al, 2014 | US | Hospital – specialty  (Psychiatry) | 89 nurses, 2 hospitals | RNs and others not specified | MBI-HSS | **Predictors:**   * Workload (Study questionnaire) * Autonomy (NWI-R)   Transformational leadership (Multifactor Leadership) | N | Y | N | Y |
| Marques-Pinto et al, 2018 | Portugal | Hospital - general | 2235 nurses, 31 hospitals | Nurses | MBI (EE) | **Predictors:**   * Job demands (PES-NWI) * Nurses’ participation in hospital affairs (PES-NWI)   **Outcomes**:  Intention to leave (Study Questionnaire) | Y | Y | N | N |
| Moloney et al, 2018 | New Zealand | All settings | 2876 nurses | Nurses | Malach-Pines Burnout measure scale (BMS-10) | **Relationships:**   * Job demands: quantitative demands, Emotional demands-hindrances, Emotional demands-challenges (Job-demands scale) * Personal demands: Work-life interference (Work-life interference scale) * Job resources; Supervisor support and Colleague support (Supervisor and Colleague Support scale), Organizational support (Organizational Support Scale), Autonomy (Work Design Questionnaire), Professional development (Professional Development scale) * Personal resources: Psychological capital/self-efficacy (PsyCap questionnaire), Value congruence (Retention model) * Intention to leave organization (Retention survey)   Intention to leave profession (Retention survey) | Y | Y | N | N |
| Nantsupawat et al, 2016 | Thailand | Hospital – specialty  (Community) | 2084 RNs, 94 hospitals | RNs | MBI | **Outcomes (Study questionnaire):**   * Quality of care * Patient falls * Medication errors   Infections | Y | Y | Y | Y |
| Nantsupawat et al, 2017 | Thailand | Hospital - all wards | 1351 nurses, 43 units 5 hospitals | Inpatient nurses | MBI (EE) | **Predictor:**  Nurse work environment (PES-NWI) | Y | Y | Y | Y |
| Parker and Kulik, 1995 | US | Hospital - all wards | 73 RNs | RNs providing direct patient care | MBI | **Predictors:**   * Job stress (Nursing Stress Scale) * Social work-related support (Social Support Scale)   **Outcomes:**   * Self-rated performance (Nurse questionnaire) * Supervisor-rated performance (Clinical Services Director questionnaire) * Reported Absenteeism (Mental) (Nurse questionnaire) * Reported Absenteeism (Physical) (Nurse questionnaire) * Sick leave (HR records)   Intention to quit (Nurse questionnaire) | N | Y | N | Y |
| Poghosyan et al, 2010 | US, Canada, UK Germany, New Zealand and Japan | Hospital - all wards | 52709 nurses, 616 hospitals | Nurses | MBI | **Outcome:**  Nurse-rated quality of care (Study questionnaire) | Y | Y | Y | Y |
| Poncet et al, 2007 | France | Hospital - critical care/ED | 2392 nurses, 278 units | Registered nurses, nurse assistants, head nurses | MBI (composite score) | **Predictors (Study questionnaire):**   * Able to schedule days off according to personal wishes * Participates in a research group * Conflicts with patients * Relationship with head nurses * Relationship with physicians * Caring for a dying patient   Number of decisions to forego life-sustaining therapies last week | Y | Y | N | Y |
| Rouxel, 2016 | France | Primary Care and Community | 371 nurses, 79 geriatric care centres | Geriatric care nurses | MBI (EE, DEP) | **Relationships:**   * Affectivity (Positive and Negative Affect scale) * Occupational group (nurses vs auxiliary nurses) * Perceived display rules (Emotion Work Requirements scale) * Job demands (Job-content questionnaire) * Job control (Job-Content questionnaire)   Job satisfaction (Work Design questionnaire) | Y | Y | N | N |
| Rudman and Gustavsson, 2011  *Prospective longitudinal* | Sweden | All settings | 997 RNs | Newly graduate registered nurses | Scale adapted from Job demands-resources model of burnout | **Predictors-all measured by study questionnaire unless indicated:**   * Age * Gender * Children * Country of birth * Previous training as nurse assistant * Previous work experience in healthcare * Performance-based self-esteem (PBSE scale) * Affectivity (Personality Inventory) * Self-rated health * Eating habits * Smoking * Alcohol consumption (Alcohol Use Disorders Identification Test) * Depressive mood * Depressive episode (Major Depression Inventory) * Musculoskeletal tension and pain * Back pain * Neck and shoulder pain * Burnout symptoms during studies * Present stressors * Importance of nursing studies * Overall educational outcome   Satisfaction with induction | Y | Y | N | Y |
| Shamian et al, 2002 | Canada | Hospital - critical care/ED | 6188 RNs, 160 hospitals | RNs | MBI (EE) | **Predictors:**   * Merged hospital (Study questionnaire) * Hospital type (Study questionnaire) * Percentages of nurses full-time (Study questionnaire) * Nurse autonomy (NWI-R) * Control over practice setting (NWI-R) * Nurse-physician relations (NWI-R)   Effort and reward imbalance (ERI score) | Y | Y | N | Y |
| Shao et al, 2018 | China | Hospital - all wards | 19,184 RNs | RNs | C-MBI (EE, DEP) | **Predictor:**   * Work environment (Chinese Nursing Work Environment scale)   **Moderator:**  Value congruence (Perceived fit scale) | Y | Y | Y | Y |
| Smith Lewis and Cunnigham, 2016 | US | Hospital - all wards | 120 nurses | Nurses | MBI-GS (composite score) | **Predictor:**   * Transformational leadership (Rafferty and Griffin scale)   **Mediators:** Areas of work life: Manageable workload, control, reward, community, fairness, values (Areas of Worklife Scale) | N | Y | N | Y |
| Stimpfel et al, 2012 | US | Hospital - general | 22,275 RNs, 577 hospitals | RNs | MBI (EE) | **Predictor:** Shift length (Study questionnaire) | Y | Y | Y | Y |
| Stone et al, 2007 | US | Hospital - all wards | 2047 nurses, 13 hospitals | Mainly RNs (unclear which other groups) | MBI | **Predictors (Perception of Nurse Work Environment scale):**   * Professional practice * Nurse/physician collaboration * Low nurse management * Positive scheduling climate * Low opportunity for advancement   Low unit decision-making | Y | Y | Y | Y |
| Teng et al, 2010 | Taiwan | Hospital - general | 458 nurses, 90 units, 2 hospitals | Nurses | MBI (composite score in regression) | **Outcome:**  Patient safety (Study questionnaire) | N | Y | N | Y |
| Thompson, 2014  *Longitudinal* | US | Hospital - general | 2011: 326,750 nurses, 12,915 units, 677 hospitals 927 2012: 327,396 nurses, 18,874 units, 927 hospitals | RNs | Scale developed for study (2 questions) | **Predictors (Practice Environment Scale):**   * Nurse manager leadership * RN and medical doctor collaboration * Policy involvement * Staffing adequacy * Nursing model of care   **Mediator:**   * Missed care (NDNQI Survey)   **Outcomes:**  Hospital-acquired pressure ulcer prevalence rate | Y | Y | N | Y |
| Tourigny et al, 2010 | Japan and China | All settings | 789 nurses (239 Japan, 550 China) | Nurses | MBI | **Relationships:**   * Depression (Centre for Epidemiological Studies Depression Survey) * Job satisfaction (Stephen Kerr scale)   Absenteeism (Study questionnaire) | Y | Y | Y | Y |
| Vahey et al, 2004 | US | Hospital – specialty (AIDS) | 820 nurses, 621 patients, 40 units, 20 hospitals | Staff nurses (RN’s and LPN’s) | MBI | **Predictor:**   * Work environment (NWI-R)   **Outcomes:**  Patient satisfaction (La Monica-Oberst Patient Satisfaction Scale) | Y | Y | Y | Y |
| Van Bogaert et al, 2009 | Belgium | Hospital - general | 401 nurses, 31 units, 2 hospitals | Staff nurses | MBI | **Relationships:**   * Nurse-physician relationship (NWI-R) * Nurse management at the unit level (NWI-R) * Hospital management & organizational support (NWI-R) * Nurse-assessed quality of care (Study questionnaire)   Job outcomes: job satisfaction, intention to stay in current hospital, intention to stay in nursing, and apply for a job in the last year (Study questionnaire) | N | Y | N | N |
| Van Bogaert et al, 2013 | Belgium | Hospital - all wards | 1201 RNs, 116 units, 8 hospitals | RNs | MBI | **Relationships:**   * Nurse-physician relationship (NWI-R) * Nurse management at the unit level (NWI-R) * Hospital management & organizational support (NWI-R) * Workload (Intensity of Labour scale) * Decision latitude (Decision latitude scale) * Social capital (Study questionnaire) * Nurse-assessed quality of care (Study questionnaire)   Job outcomes: job satisfaction, intention to stay in current hospital, intention to stay in nursing, and apply for a job in the last year (Study questionnaire) | Y | Y | N | N |
| Van Bogaert et al, 2014 | Belgium | Hospital - all wards | 1108 RNs, 96 units, 2 hospitals | RNs | MBI | **Predictors:**   * Nurse-physician relationship (NWI-R) * Nurse management at the unit level (NWI-R) * Hospital management & organizational support (NWI-R) * Workload (Intensity of Labour scale) * Decision latitude (Decision latitude scale)   **Outcomes (Study questionnaire):**   * Job satisfaction * Job outcomes: job satisfaction, intention to stay in nursing (Study questionnaire) * Quality of care of the current unit * Quality of care at last shift * Quality of care in hospital the last year * Patient and family complaints * Patient and family verbal abuse * Patient falls * Nosocomial infections   Medication errors | Y | Y | N | N |
| Vidotti et al, 2018 | Brazil | Hospital - all wards | 502 nurses, 1 hospital | Nurses | MBI-HSS | **Predictors:**   * Psychological demands (Demand-Control Support Questionnaire) * Work control (Demand-Control Support Questionnaire) * Social support received at work (Demand-Control Support) * Shift type (Demand-Control Support Questionnaire) * Dissatisfaction with sleep (Demand-Control Support Questionnaire) * Children (Demand-Control Support Questionnaire) * Number of years at the institution (Demand-Control Support Questionnaire)   Job type (Demand-Control Support Questionnaire) | N | Y | N | Y |
| Wisetborisut et al, 2014 | Thailand | Hospital - all wards | 2772 nurses, 1 hospital | Health-care workers, nurses, nurse aid, other | MBI (burnout= 1 high score in at least one subscale) | **Predictors (Study questionnaire):**   * Total number of shifts per month * Number of night shifts per month * Number of years working shifts * Days off per month   Sleeping time (hours per day) | N | Y | N | Y |
| Zarei et al, 2016 | Iran | Hospital - all wards | 250 nurses, 4 hospitals | RNs | MBI | **Outcome:**  Patient safety climate (study sample) | N | Y | N | N |
| Zhang et al, 2014 | China | Hospital - all wards | 9698 nurses, 181 hospitals | Nurses | MBI | **Predictors:**   * Work environment (PES-NWI) * Employment status (Study questionnaire)   Education level (Study questionnaire) | Y | Y | N | Y |
| Zhou et al, 2015 | China | Hospital - general | 1100 nurses 20 hospitals | Nurses | MBI (EE) | **Predictors:**   * Hospital-level nurse staffing (Study questionnaire) * Nurse-rated working environment (PES-NWI)   Nursing actual working time (Study questionnaire) | Y | Y | N | Y |
| \* A multisite study with more than 500 participants ;  \*\* Burnout and correlates assessed with the same survey; it arises when there is shared (common) variance because of the common method rather than a true (causal) association between variables)  \*\*\* Nurses nested in wards, wards nested in hospitals)  \*\*\*\* The association between burnout and correlates has been adjusted for potentially influencing variables. | | | | | | | | | | |

Table2 Summary of studies’ results

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Hypothesised by Maslach’s theory** | **Observed** | **Refuted\*\*** | | | **Number of studies supporting the relationship** |
| 1. ***Areas of Worklife*** |  |  |  | | |  |
| Areas of Worklife (high score on Areas of worklife scale) | √ | √ |  | | | 4 out of 4 |
| 1. ***Workload and Staffing Levels*** |  |  |  | | |  |
| High Workload | √ | √\* (definitive for EE only) |  | | | 12 out of 13 |
| Nurse Staffing levels (low/inadequate) |  | √\* |  | | | 12 out of 15 |
| Time pressure |  | √\* (definitive for EE only) |  | | | 3 out of 3 |
| 1. ***Job Control, Reward, Values, Fairness, Community*** |  |  |  | | |  |
| Low Control over the job | √ | √\* |  | | | 5 out of 7 |
| Low Reward | √ | √\* |  | | | 3 out of 3 |
| Low Value congruence | √ | √\* (definitive for EE and DEP) |  | | | 7 out of 8 |
| 1. ***Shift work and Working Patterns*** |  |  |  | | |  |
| Night work |  |  | √ | | |  |
| Overtime |  |  | √ | | |  |
| Number of hours worked per week |  |  | √ | | |  |
| ≥12-hour shifts |  | √\*(definitive for EE only) |  | | | 4 out of 4 |
| Low Schedule flexibility |  | √\* (definitive only for EE) |  | | | 1 out of 1 |
| 1. ***Psychological Demands and Job Complexity*** |  |  |  | | |  |
| Job and psychological demands |  | √\* (definitive for EE only) |  | | | 8 out of 8 |
| Low Task variety |  | √\* |  | | | 4 out of 4 |
| High Patient complexity |  | √\* |  | | | 4 out of 4 |
| Role conflict |  | √\* (definitive for EE only) |  | | | 4 out of 4 |
| Low Autonomy |  | √\* |  | | | 4 out of 6 |
| Low Decision latitude | √ | √\* |  | | | 4 out of 4 |
| 1. ***Support Factors: Working Relationships and Leadership*** |  |  |  | | |  |
| Negative nurse-physician relationship |  | √\* |  | | | 10 out of 12 |
| Low supervisor/leader support |  | √\* |  | | | 12 out of 12 |
| Leadership styles that are not authentic & transformational |  | √\* (definitive only for EE) |  | | | 14 out of 14 |
| Negative team relationship |  | √\* |  | | | 14 out of 15 |
| 1. ***Work Environment and Hospital Characteristics*** |  |  |  | | |  |
| Negative work environment (global scale) |  | √\* (definitive for EE only) |  | | | 11 out of 11 |
| Low Structural/organisation empowerment |  | √\* (definitive for EE only) |  | | | 7 out of 7 |
| Limited Participation in hospital affairs (including policy & research) |  | √\* |  | | | 2 out of 3 |
| No Development opportunities |  |  | √ | | |  |
| Low Pay |  |  | √ | | |  |
| High Job insecurity |  | √\* |  | | | 1 out of 1 |
| Model of nursing care |  |  | √ | | |  |
| Specialised Hospital/Ward Type |  |  | √ | | |  |
| Magnet Hospital |  |  | √ | | |  |
| 1. **Staff outcomes and Job performance** | **Hypothesised by Maslach’s theory** | **Observed** | **Refuted** | | |  |
| Intention to leave |  | √\* |  | | | 19 out of 19 |
| Turnover | √ |  | √ | | |  |
| Low job performance |  | √\* |  | | | 2 out of 2 |
| Missed care |  | √\*\*\* |  | | | 3 out of 3 |
| Sickness absence | √ | √\* |  | | | 3 out of 4 |
| Poor General health | √ | √\* (definitive for EE only) |  | | | 4 out of 4 |
| Mental health issues (including depression) |  | √\* |  | | | 5 out of 5 |
| Job dissatisfaction |  | √\*\*\* |  | | | 10 out of 11 |
| 1. **Patient care and outcomes** |  |  |  | | |  |
| Poor Quality of care |  | √\* |  | | | 7 out of 8 |
| Poor Patient Safety |  | √\* |  | | | 5 out of 5 |
| Adverse events |  | √\* |  | | | 3 out of 3 |
| Patient negative experience (incl. dissatisfaction and verbal abuse) |  | √\* |  | | | 2 out of 2 |
| Medication errors |  | √\* |  | | | 2 out of 2 |
| Infections |  | √\* |  | | | 3 out of 3 |
| Pressure ulcers |  |  | √ | | |  |
| Patient falls |  | √\* |  | | | 2 out of 2 |
| \*Partial evidence (e.g. relationship established with some but not all burnout subscales)  \*\* Refuted when there is consistent evidence that a hypothesised relationship does not exist (e.g. large studies with no confidence intervals shown if no association)  \*\*\* Observed in multiple directions | | | |  |

Figure 1

Figure 2



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