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ORGANIZATIONAL CLIMATE AND EMPLOYEE MENTAL HEALTH OUTCOMES: A SYSTEMATIC REVIEW OF STUDIES IN HEALTH CARE ORGANIZATIONS

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ABSTRACT

Background: In recent years, the high prevalence of mental health problems among health care workers has given rise to great concern. The academic literature suggests that employees' perceptions of their work environment can play a role in explaining mental health outcomes.

Purposes: We conducted a systematic review of the literature in order to answer the following two research questions: (1) how does organizational climate relate to mental health outcomes among employees working in health care organizations and (2) which organizational climate dimension is most strongly related to mental health outcomes among employees working in health care organizations.

Methodology/Approach: Four search strategies plus inclusion and quality assessment criteria were applied to identify and select eligible studies. As a result, 21 studies were included in the review. Data were extracted from the studies to create a findings database. The contents of the studies were analyzed and categorized according to common characteristics.

Findings: Perceptions of a good organizational climate were significantly associated with positive employee mental health outcomes such as lower levels of burnout, depression, and anxiety. More specifically, our findings indicate that group relationships between co-workers are very important in explaining the mental health of health care workers. There is also

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evidence that aspects of leadership and supervision affect mental health outcomes. Relationships between communication, or participation, and mental health outcomes were less clear.

Practical Implications: If health care organizations want to address mental health issues among their staff, our findings suggest that organizations will benefit from incorporating organizational climate factors in their health and safety policies. Stimulating a supportive atmosphere among co-workers and developing relationship-oriented leadership styles would seem to be steps in the right direction.

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INTRODUCTION

In recent years there has been great concern over the work-related mental health of employees working in health care organizations. Several studies have reported a high incidence of mental distress among health care workers. Based on data from the literature, Embriaco et al. (2007) concluded that severe burnout syndrome is present in about 50 percent of critical care physicians and in one-third of critical care nurses. Letvak et al. (2012) found 18 percent of 1,171 U.S. hospital nurses surveyed reported depressive symptoms: a figure twice that in the general population.

A large number of empirical studies have focused on organizational factors that explain the mental health problems of health care workers. These often rely on theoretical frameworks, such as the effort-reward imbalance model or the job demands-control (JD-C) model, that provide insights regarding the impact of an individual's job design. The growing body of empirical research on the relationship between individual job design and employee health has given rise to several systematic reviews on the subject. For instance, Michie and Williams (2002) reviewed the literature up to the year 2000 and concluded that the empirical evidence is consistent with the JD-C model: that the most common work factors associated with psychological ill health are work demands (long hours, workload, and pressure), a lack of control over work, and poor support from managers.

Although these factors certainly influence employee mental health outcomes, the majority of research to date has examined psychological ill health from an individual job design perspective (e.g. Stansfeld & Candy, 2006). In this study, we have taken a different, less familiar, perspective that focuses on the organizational climate (OC) within an organization. Rooted in Lewinian field theory, the OC approach concentrates on those

aspects of the social environment that are consciously perceived by organizational members (Denison, 1996). In this review, we explicitly view OC as *the perceptions of the social and interpersonal aspects of the work situation* (Wilson et al., 2004) such as leadership, group behavior, and communication. In taking an OC perspective, we hoped to add to what is already known from the reviews and studies that adopt an individual job design perspective. While we recognize the importance of employees' perceptions of their immediate work tasks in explaining mental health outcomes, we believe that a broad review of studies that include mental health predictors related to the social and interpersonal aspects of the work situation will contribute to our knowledge about occupational mental health in health care organizations. Our focus on OC will moreover provide new directions to those interested in managing the health of health care workers.

Although there have been several systematic reviews on the subject of OC, these have focused either on outcomes other than employees' mental health, such as work attitudes, motivation, and performance (Parker et al., 2003), or on a specific aspect of climate such as safety climate (Clarke, 2006) or ethical climate (Schluter, 2008). We were able to identify two literature reviews that had examined the impact of OC on health outcomes among health care employees. First, MacDavitt et al. (2007) conducted a review on the effects of OC on patient and employee outcomes. However, their search strategy only included burnout as a mental health outcome, and they only reviewed studies conducted in hospitals. The second review, by Gershon et al. (2007), addressed the role of OC in three health outcomes: musculoskeletal disorders, needlestick injuries, and burnout. However, as in the other review, burnout was the only indicator of employee mental health used. Further, the review only included empirical studies within US hospitals. These reviews both concluded that OC is related to employee mental health. More specifically, Gershon et al. (2007) concluded that leadership variables are associated with burnout among health care employees. The current

paper contributes to the field by extending the existing literature reviews of MacDavitt et al. (2007) and Gershon et al. (2007) in four ways. First, by employing a time period covering the period from 2000 and 2012, we include more recent work published in the five years since the earlier reviews. Second, we did not limit ourselves to studies in hospitals or about nurses, but examined a wide variety of health care organizations and occupations. Third, we included a wide range of mental health problems (i.e. burnout, anxiety, depression, psychological distress). Finally, we also searched for evidence of an OC–mental health relationship in studies conducted in countries other than the United States.

There is a lack of uniformity in both the terminology and the measurement of the OC concept (Kuenzi & Schminke, 2009). We decided, therefore, to not only look at the impact of OC as a distinct construct, but also include research on the mental health consequences of dimensions that are generally seen as part of this climate construct. In this respect, we distinguished three dimensions of OC based on the work of Wilson et al. (2004) and Gershon et al. (2004): (1) leadership and supervision, (2) group behavior and relationships, and (3) communication and participation. As such, the purpose of this paper is to give a comprehensive overview of the published evidence on the relationship between OC (and three of its dimensions) and mental health outcomes. To this end, a systematic review was conducted guided by the following two research questions:

RQ 1: *How does organizational climate relate to the mental health of employees working in health care organizations?*

RQ 2: *Which dimension of organizational climate is most strongly related to the mental health of employees working in health care organizations?*

THEORETICAL FRAMEWORK

The Organizational Climate Concept

The OC concept has been defined in many different ways (Schneider, 2013) and previous research has highlighted the lack of consensus in terminology and measurement (e.g. Fink & Chen, 1995; Kuenzi & Schminke, 2009). Most OC scholars tend to agree on the following two aspects of the climate concept.

First, there is considerable agreement on the distinction between organizational climate and culture. Although the concepts have some conceptual overlap, they are distinctly identifiable within organizations (Moran & Volkwein, 1992; Schneider et al., 2013). Culture refers to the implicit underlying values, beliefs, and assumptions that guide employees' behavior (Schneider et al., 2013). Climate, in contrast, concerns the meaning employees attach to the tangible policies, practices, and procedures they experience in their work situation (Schneider et al., 2013). In this review, we explicitly focus on employee perceptions of the social and interpersonal practices of the work situation (Wilson et al., 2004). Wallace et al. (1999) studied the relationship between culture and climate and concluded that both concepts are related, but that a causal direction between the two should not be presumed.

Second, OC can be described either in terms of organizational features that can be applied to any number of contexts and industries, or in terms of specific features that are tied to the subject of interest. The first approach is referred to as a global approach to climate (Patterson et al., 2005) or as molar climates (Schneider et al., 2013). The latter approach is described as a domain-specific approach (Patterson et al., 2005), or as focused climates (Schneider et al., 2013), and addresses certain types of climate such as service climate, safety climate, or ethical climate. However, there is little research on the relationship between specific climates and general OC (Schneider et al., 2013). One notable exception is the study

by Neal et al. (2000) that found that general OC has a significant impact on the safety climate within the Australian hospital sector.

Several studies have found that climate perceptions are related to a number of important performance outcomes in health care, such as quality of care (Aiken et al., 2002), innovative behavior (West & Anderson, 1996), and patient satisfaction (Ancarani et al., 2009). Other health care worker-related outcomes that have been related to OC include job satisfaction, commitment, and intention to leave (Aarons & Sawitzky, 2006; Stordeur et al., 2007). As such, it is important that health care organizations understand how the OC they generate affects their employees and performance.

Organizational climate dimensions

To further clarify the description of OC used in this study, we adopt a characterization of the concept used by Gershon et al. (2004). These authors conducted a review of the biomedical literature to start a process of standardizing the terminology. To this end, they reviewed measurement instruments for OC and identified four major dimensions of the concept: (1) leadership characteristics, (2) group behaviors and relationships, (3) communication, and (4) structural attributes of the quality of work life. The first three dimensions clearly refer to social and interpersonal aspects of the work situation. However, the structural attributes dimension better fits the work domain that Wilson et al. (2004) described as 'job design'. The clear separation between aspects belonging to the job design domain and those aspects that are classified as OC (see also the conceptual model by Stordeur et al., 2007) led us to exclude Gershon et al.'s (2004) structural attributes dimension from this review. Further, since participation and involvement are also frequently included as climate dimensions in the literature (Patterson et al., 2005), the communication dimension

was extended to cover 'communication and participation'. This left us with the following three dimensions (see also Gershon et al., 2004):

1. *Leadership and supervision*. This refers to an employees' perception of leadership and supervision, and comprises aspects such as: leadership style, type of supervision, degree of management support, leadership trust, and type of leadership hierarchy.
2. *Group behaviors and relationships*. This dimension describes characteristics of interpersonal interactions, group behaviors, co-worker trust, group supportiveness, and group cohesion.
3. *Communication and participation*. The final dimension refers to the formal and informal mechanisms used to transfer information. The degree of participation or involvement in decision-making is also included.

Employee mental health

For our study, we chose to interpret the term health in line with the argument of Danna and Griffin (1999). They proposed that the term "health" should be used in organizational research that investigates physiological or psychological symptomology within an essentially medical context (i.e. reported symptomology or diagnosis of illness or disease). "Well-being", on the other hand, tends to be a broader concept that takes the "whole person" into consideration (e.g. job or life satisfaction, commitment). Since we are interested in employees' mental health, we have examined outcomes that are either listed as a psychological disease (burnout, depression, and anxiety) or are more general measures of mental health (psychological distress and general mental health). We chose this rather broad range of mental health outcomes to boost the number of studies included in our review.

Organizational climate and employee mental health

Theorists and researchers have proposed a variety of mechanisms linking OC to mental health. Generally, the research can be divided based on which of two sets of models was employed.

One set of models describes OC as a job stressor that directly influences employees' mental health. For example, in their model of a healthy workplace, Kelloway and Day (2005) show that organizational factors (e.g. interpersonal relationships at work, employee involvement, and a culture of support, respect, and fairness) influence mental health. In this model, both job demands and broader organizational characteristics, such as climate, act as occupational stress factors that affect mental health outcomes.

The other set of models proposes an indirect relationship between OC and employee mental health. For example, in their model of the healthy work organization, Wilson et al. (2004) showed that OC is related to mental health through its effects on job design, job future, and psychological work adjustment. Based on these findings, it was argued that employees' perceptions of their work environment influence the way they relate to their job and their future in the organization. Positive perceptions decrease job stress and therefore result in better mental health. Our review includes studies from both groups of models.

METHODS

Literature search

Four complementary searching strategies were used to find relevant studies for our systematic review. First, a computerized search was initiated using three electronic databases: PsychINFO, Medline, and Scopus. Searches included several keywords and synonyms to locate studies published between 2000 and 2012 that covered relevant (sub-) concepts. We

attempted to find studies that addressed OC by using keywords such as social context, work, or practice environment. We chose this approach because authors in different disciplines use many different terms to describe features that refer to OC (Sleutel, 2000). The OC measure column in Table 1 provides an overview of the terminology used in the reviewed studies. In addition, we did three searches using keywords for the three dimensions of OC (e.g. leadership style, supervision, management, group cohesion, cooperation, group supportiveness, communication, participation, involvement) with the constraint that these dimensions had to be part of an overall climate or work environment study.

The second search strategy included a search in the online archives of five scientific journals: *Occupational and Environmental Medicine*, *Journal of Occupational and Environmental Medicine*, *Health Care Management Review*, *Journal of Occupational Health Psychology* and *Social Science & Medicine*. We chose these journals because they are the major journals on this subject.

Thirdly, we examined the references in previous literature reviews and key studies in this field.

Finally, we asked several key health care researchers working in the field of OC whether they knew of additional studies that met our criteria for inclusion as outlined below.

Inclusion criteria

Titles, abstracts and manuscripts were included if they met all of the following inclusion criteria:

Type of study – Studies should primarily deal with the relationship between OC (or dimensions thereof) and employee mental health outcomes. Studies were included if the OC concept was examined using a composite scale or if at least two of the three climate dimensions were tested.

Type of participants – Either the entire sample of the study had to be employees working in a health care organization, or results should be presented for health care workers as a subgroup.

Study design – Studies had to contain empirical research. Moreover, we were interested in studies that quantitatively examined correlations between variables (i.e. use bi- or multi-variate analyses in presenting the results). This excluded studies using a qualitative research design.

Language – Only studies in English were considered.

Publication status – Only studies published in peer-reviewed journals were included. The main advantage of this control is that it serves as an extra quality check. As a result of the review process, published studies are likely to be of a higher quality than non-published studies. At the same time, we acknowledge this could potentially lead to a publication bias also known as the file-drawer problem (Rosenthal, 1979).

Year of publication – Only studies that were published in the period from 2000-2012 were retrieved.

Quality assessment

In the final part of the assessment, we reviewed each study for methodological quality using a quality assessment tool. This is comprised of 12 criteria that can be used to assess four study aspects: design, sampling, measurement, and statistical analysis. The tool was adapted from an instrument developed by Cummings et al. (2010) and has been used in previously published systematic reviews (e.g. Wong & Cummings, 2007; Cummings et al., 2010). The tool was slightly adapted so that we could use it to assess the studies identified (i.e. changes made to the concepts addressed, see Table 2).

Data extraction and analysis

Given that the studies varied greatly in their measurement of the relevant concepts, analysis techniques, and effect sizes reported, it was unfortunately not possible to perform a meta-analysis. Therefore, we decided to analyze the contents using a conventional vote-counting procedure (Bushman & Wang, 1994). We categorized the studies according to their shared characteristics and defined three possible outcomes for each tested relationship: significantly positive, significantly negative, or non-significant. The number of relationships falling into each of these three categories was summed and if a majority of the relationships fell into one of these categories, that modal category was declared 'the winner' (Light & Smith, 1971).

RESULTS

Search Results

Using the four search strategies outlined above, we identified more than 4,000 potentially relevant studies published between 2000 and 2012 (see Figure 1). After removing the duplicates, 2,308 studies remained. A further 2,214 studies were excluded based on a reading of their abstracts, leaving 94 studies. The full-text assessment of these excluded a further 70 studies seen as irrelevant and 3 low quality studies. This selection process thus resulted in 21 studies for the review. Of these 21 studies, 13 had been initially identified through database searching, four through journal archives, three from reference lists, and one study had been suggested by the key researchers. The search had identified all the relevant studies included in the previous reviews by Gershon et al. (2007) and MacDavitt et al. (2007).

Given our search approach and that we initially started with over 2,000 different articles, the final total of 21 studies was less than we had expected. The most common reason for exclusion was the use of a sample including non-healthcare employees. Much of the research on the relationship between OC and mental health outcomes uses a mixed sample of occupations, or a population-based survey. Moreover, the majority of the OC research does not focus on mental health outcomes, but on work attitudes and behavior (e.g. job satisfaction, commitment, turnover). The results of the quality assessment are presented in Table 2 and Table 3.

[Figure 1 about here]

[Table 2 about here]

[Table 3 about here]

The results of the studies included in our systematic review are shown in Table 1 (see Appendix 1). Figure 2 presents the results of our data analysis.

[Figure 2 about here]

The organizational climate concept and mental health outcomes

Of the 21 studies included in the review, only six studies examined OC by looking at the *combined* effect of multiple dimensions. Aiken et al. (2008), for instance, tested the effect of the care environment, including both leadership and group behavior dimensions, among a large group of nurses (N= 10,184) working in 160 US hospitals. Their findings revealed that the likelihood of nurses experiencing burnout were 24 percent lower in hospitals with good working environments than in hospitals with mixed environments, and lower in hospitals

with mixed environments than in hospitals with poor environments. The sample of 820 nurses used by Vahey et al. (2004) provided similar results with a nurse work environment construct, consisting of leadership and group behavior dimensions, having a statistically significant negative effect on the emotional exhaustion of nurses.

Two cross-sectional US-based studies, by Patrician et al. (2010) and by Flynn et al. (2009), examined the effect of a work environment construct that encompassed all three OC dimensions. Each study surveyed a specific group of nurses and measured the nurse practice environment. Both studies found that respondents who rated their practice environments as unfavorable were more likely to suffer burnout than nurses who rated their practice environment as favorable. While the findings of Patrician et al. (2010) showed an odds ratio of 4.60, the study by Flynn et al. (2009) reported odds ratios up to 12.70. That is, according to the latter study, nurses who experience an unfavorable work environment are nearly 13 times more likely to experience emotional exhaustion than those in a favorable environment.

Although the previously mentioned studies suggest a positive impact of a favorable OC on employee mental health outcomes, we should keep in mind that they are cross-sectional in nature. However, we found one longitudinal study that did assess the impact of the climate on health care workers' mental health over time. Ylipaavalniemi et al. (2005) conducted a prospective cohort study on the relationship between team climate and doctor-diagnosed depression among various hospital employees (N= 3,651). The authors measured team climate, which included aspects of two OC dimensions (group behaviors and communication), and tested whether this could predict the two-year incidence of depression. Their results revealed an association between poor team climate and the risk of depression that was independent of lifestyle factors and psychological distress at a baseline. Thus, a favorable OC appears to positively influence the mental health of health care employees. Another interesting finding was that job control, work demands, and job strain were not

predictors of the two-year incidence of depression. The authors concluded that the job strain model and the team climate model must therefore reflect different aspects of the work environment (Ylipaavalniemi et al., 2005: 120), which is consistent with our initial assumption that studies focusing on job design are examining something different than studies that focus on OC.

Another cross-sectional study, by Hanrahan et al. (2010), focused on the effect of work environment on burnout using a sample of 353 hospital psychiatric nurses. This study tested the impact of a composite work environment scale encompassing all three OC dimensions *and* the impact of the individual subscales. Their analyses showed that the nurse-physician collaboration and the leadership subscales were both significantly associated with nurse emotional exhaustion, whereas the participation subscale was not. The composite scale was also revealed to be significantly associated with emotional exhaustion. Notably, the effect of the composite scale appeared to be stronger than the effects of the individual subscales.

Overall, the studies that tested a composite scale of OC dimensions showed that there is a statistically significant and positive association between OC and mental health outcomes.

Leadership and mental health outcomes

Of the three OC dimensions, the leadership and supervision dimension has been the one most often used to predict employee mental health outcomes with nearly 40 percent of the relationships reported in the included studies testing at least one aspect of the leadership and supervision dimension (e.g. supervisory support, trust in the leader, and fairness of leadership).

Within the leadership and supervision dimension, the impact of supervisor support was the aspect most often tested. Some studies reported that poor mental health outcomes

were significantly lower with strong supervisor or higher management support (Akerboom & Maes, 2006; Kawano, 2008; Van Bogaert, 2009). Here, Akerboom and Maes (2006) showed that supervisor support had a negative impact on reported psychological distress among their sample of Dutch nursing home employees. Kawano (2008) reported a significant negative impact of direct supervisor support on emotional exhaustion and depression in Japan, while Van Bogaert et al. (2009) found that support from top management can lower emotional exhaustion. However, overall, the findings appear to be inconsistent with several other studies in failing to find a significant relationship between management support and mental health outcomes (Jolivet et al., 2010; Jenkins & Elliot, 2004; Gunnarsdottir et al., 2009; Eriksen et al., 2006; Meeusen et al., 2011).

Other predictors categorized within the leadership dimension were somewhat heterogeneous. Four studies tested the impact of a more general measure of nurse management (variously labelled 'nurse manager skills', 'nurse manager ability, leadership and support', 'relationship with head nurses,' or 'nurse management') and reported significantly lower emotional exhaustion (Friese, 2005; Hanrahan, 2010; Stone et al., 2007) and burnout (Poncet et al., 2007) in situations of highly rated nurse management. According to Williams et al. (2007) and Linzer et al. (2009), leadership alignment is also negatively associated with burnout among physicians. Ylipaavalniemi et al. (2005) and Eriksen et al. (2006) both used a longitudinal design and looked at the impact of the way an employee perceives fairness of leadership on mental health outcomes. The research team of Ylipaavalniemi (2005) found that perceptions of unfair leadership positively predicted employee depression. In contrast, Eriksen et al. (2006) failed to find a significant relationship between this predictor and employee psychological distress. A recent study by Bobbio et al. (2012) examined five types of leadership behavior and found that three of them, namely leading by example, informing, and showing concern/interaction, were significantly related to

nurses reporting less emotional exhaustion, whereas the other two types (participative decision-making and coaching) were not. Moreover, their results showed that having trust in the leader was negatively associated with emotional exhaustion.

In our overall review, 17 of the 29 relationships (59%) categorized as falling within the leadership and supervision dimension were reported as statistically significant and 12 relationships (41%) as non-significant. None of the significant relationships suggested that leadership led to an increase in poor mental health among employees.

Group relationships and mental health outcomes

A total of 26 relationships had been tested in the group relationships and behavior dimension of OC. In contrast to the inconsistent findings related to social support in the leadership dimension, the studies included in the group relationships and behavior dimension consistently revealed that co-worker social support has a significant effect on employee mental health. Three cross-sectional studies provided support for a negative effect of co-worker social support on emotional exhaustion (Jenkins & Elliot, 2004), anxiety and depression (Kawano, 2008), and burnout (Meeusen et al., 2011). Moreover, Eriksen et al.'s (2006) longitudinal study showed that changes in the work situation that resulted in less support and less encouragement were positively associated with a higher level of psychological distress. Despite the consistent evidence these studies provide on the importance of co-worker social support in explaining employees' mental health, there was one study that failed to find such a relationship (Akerboom and Maes, 2006).

Given that the majority of the reviewed studies focused on nurses, a considerable amount of evidence was collected on the impact of the nurse-physician relationship on nurse mental health outcomes. Friese (2005) for example reported a significant, negative association between collegial nurse-physician relationships and nurse emotional exhaustion.

The results described in Stone et al. (2007), Poncet et al. (2007), Van Bogaert et al. (2009), and Hanrahan et al. (2010) agree with this finding. Notably, Gunnarsdottir et al. (2009) tested this relationship but found no significant association.

The other relationships tested within the group relationships dimension included more general predictors of the relationship between workers, such as 'social climate', 'cohesion', or 'interpersonal relationship'. Arnetz et al. (2011), in a cross-sectional design, tested the impact of social climate on the general mental health of employees using a sample of nurses working in four Swedish hospitals. Results showed that employees' positive perceptions of social support and cohesion among colleagues positively influenced their mental health. Arnetz and Blomkvist's (2007) longitudinal study found a similar result. One of the most significant predictors of good mental health was a positive work climate, which refers to a positive, supportive atmosphere at work and cohesion among co-workers. Having said this, Eriksen et al.'s (2006) longitudinal study did not support this finding.

Both Jolivet el al. (2010) and Kawano (2008) found evidence that a good interpersonal relationship between workers had a negative effect on employee symptoms of depression. Kawano et al. (2008) reported a similar result for employee anxiety.

On aggregating these results, it becomes clear that a majority of the relationships tested in the second dimension, namely group behaviors and relationships, point to a statistically significant association between group relationships and mental health outcomes: 19 of the relationships tested (73%) were statistically significant, whereas only seven relationships were not (27%). All of the relationships showed that positive group behavior is positively related to mental health among employees.

Communication and mental health outcomes

The third OC dimension, referring to communication and perceived participation within the organization, was the least often examined. Only 15 such relationships (20% of the total relationships tested) were tested by the 11 studies reviewed here. The study by Arnetz et al. (2011) reported a direct, positive relationship between perceived participation and employees' mental health. Further, they found evidence of an indirect effect of performance feedback on their mental health outcome measure. However, neither form of relationship had been supported by an earlier longitudinal study of Arnetz and Blomkvist (2007). These earlier findings, regarding the lack of an impact of employees' perceived organizational participation on mental health outcomes, were supported by other cross-sectional studies (Friese, 2005; Stone et al., 2007; Hanrahan et al., 2010) and one longitudinal study (Eriksen et al., 2006).

The research into other aspects of the communication dimension has also yielded inconsistent findings. Jolivet et al. (2010) reported a significant indirect effect of low communication in the work unit on the prevalence of depressive symptoms in nurses, whereas Akerboom and Maes (2006) failed to find any significant relationship between communication and psychological distress or emotional exhaustion. Similar inconsistencies can be seen in the findings when investigating information transfer as a potential predictor of mental health outcomes. Linzer et al. (2009) examined the relationship between informational emphasis and physician burnout and found a statistically significant association. However, Williams et al. (2007) reporting on a different sample, albeit from the same study, found this relationship to be non-significant.

Overall, in contrast to the other two dimensions, there is little empirical support for the communication and participation dimension having an influence on the mental health outcomes of employees working in health care organizations. Although five of the fifteen

relationships reported in the studies included in this review were statistically significant, the majority of the tested relationships (67%) were non-significant.

CONCLUSIONS AND DISCUSSION

Conclusions

The aim of this paper has been to provide a comprehensive overview of the published evidence on relationships between OC and mental health outcomes among employees working in health care organizations. In taking a global approach to OC (Patterson, 2005), we distinguished three OC dimensions: (1) leadership and supervision, (2) group relationships and behavior, and (3) communication and participation. These dimensions guided our systematic review of empirical studies published in the period 2000-2012 that had examined the OC concept. Overall, our findings support claims that a "good" OC contributes positively to the mental health of employees. In the reviewed studies, a "good" organizational climate is seen in terms of employee perceptions, including perceptions of co-worker support, nurse-physician collaboration, leadership alignment, and trust in leader.

Although somewhat similar to the now dated reviews by MacDavitt et al. (2007) and by Gershon et al. (2007), our review adds additional detailed analyses assessing the significance of individual OC dimensions for health care organizations.

The studies that examined a composite OC scale showed that OC relates positively to the mental health of employees working in health care organizations. Both cross-sectional and longitudinal studies offered support for this positive relationship. Further, the majority of the empirical research on the influence of individual OC dimensions also pointed in this direction.

From our review, it was clear that most OC research focuses on aspects belonging to the leadership or group relationships dimensions, with only a small part of the research including aspects related to the communication or participation dimension. The group relationships and behavior dimension proved to be the dimension most strongly related to mental health outcomes, followed by the leadership and supervision dimension. In terms of group relationships, co-worker support and nurse-physician relationships were important influences on employee mental health. This last aspect is in line with Schmalenberg and Kramer's (2009) observation that high-quality nurse-physician relationships not only lead to positive patient outcomes, but also to positive outcomes among nurses and physicians. Regarding relationships with leadership and supervision, we particularly found evidence that relationship-focused management (using predictors such as 'good relationship with manager' and 'leadership alignment') had positive effects on emotional exhaustion, indicating that relationship-focused managers are crucial in protecting health care employees from burnout (see also Schreuder et al., 2011).

There was relatively little evidence, and what there was was inconsistent, of a relationship between communication and mental health outcomes. This could be due to the use of different concepts and measures for aspects categorized under this dimension. Compared to the research addressing the other two dimensions, there was little consistent use of concepts across studies (such as with supervisor support within the leadership dimension and the nurse-physician relationship in the group relationships dimension). Further research employing consistent concepts and measures of information-sharing mechanisms is needed.

Conceptual model

Based on our systematic review, we have developed a conceptual model that reflects the established pathways from the OC dimensions to mental health outcomes (see Figure 3).

Figure 2 shows that most empirical research has focused on the effects of OC on burnout or emotional exhaustion. One explanation for this focus could be that burnout is a job-related mental health outcome, whereas other mental health outcomes are more generic in nature. Based on the results of their meta-analysis, De Boer et al. (2011) highlighted the importance of OC in preventing anxiety and depression among health care professionals caused by critical incidents. As such, it would be valuable to obtain additional knowledge on the relationship between OC and outcomes such as depression and anxiety.

Following the theoretical model proposed by Wilson et al. (2004), it might be helpful to include mediators when examining the relationship between OC and somewhat general mental health outcomes. Several studies in our review had indeed tested the effect of mediators such as stress (Williams et al., 2007), perceptions of effort-reward imbalance (Jolivet et al., 2010), and organizational efficacy (Arnetz et al., 2011). The use of a range of mediating mechanisms might help to better explain the effect of OC on various mental health outcomes. It would be particularly relevant to investigate the role that health care specific job demands (e.g. high emotional labour, interdisciplinary tensions, long working hours) play in the established pathways.

Future research agenda

Our findings have several implications for OC research. First, most of the studies included in this review did not examine the *collective* perceptions and interpretations of an organization's attributes, but measured the employees' *individual* perceptions. By adopting an individual unit of analysis, these studies examine psychological climate rather than focus on the effects of OC. It struck us, when reviewing the studies, that most studies fail to address this distinction or mention and explain their choices regarding their level of analysis. Notwithstanding the contribution of the individual approach to OC, we believe researchers

should be more explicit in explaining and justifying their approach. To remove the confusion produced by the use of multiple terms and measures, the field of OC research would benefit by clearly defining its levels of theory, measurement, and analysis (Parker et al., 2003). The study by Patrician et al. (2010) provides a good example by clearly specifying their conceptual and empirical reasons for choosing a purely individual-level approach when testing the effect of OC on nurses' work outcomes.

Second, only a few studies have investigated the relationship between OC and employee mental health outcomes over time, with most studies having used a cross-sectional research design. Since one cannot rule out the possibility of reverse causation when using cross-sectional data, our review indicates a need for increased longitudinal research. This may be particularly salient for this field since employees suffering from poor mental health conditions (e.g. depressive employees) may over-report an unfavourable working environment.

Additionally, the studies in this review exclusively used employee self-reports of mental health outcomes. Studies that rely on self-reporting may be prone to many kinds of response bias, and correlations may be inflated by common method variance (Panari et al., 2012). However, relying solely on "objective" data, such as health care costs or health care utilization, may not fully capture the mental health status of employees. Combining both self-reporting and other mental health measures may overcome these concerns.

Finally, the majority of the reviewed studies only examined the individual effects of OC subscales on employee mental health. Despite the significant positive results reported in these studies, our review shows that stronger effects were found in studies employing a composite OC scale (Hanrahan et al., 2010, Patrician et al., 2010; Flynn et al., 2009). Moreover, the study by Hanrahan et al. (2010), which tested the impacts of both a composite scale as well as the individual subscales, found that the composite scale had a stronger effect

than the separate subscales. Although the inclusion of a composite scale did not result in an effect greater than the sum of its individual parts in this specific study, it would be interesting to investigate whether a combination of OC aspects could have a positive synergistic effect on mental health outcomes. Future research should therefore not only focus on the influence of a composite OC scale or the influence of individual subscales, but should include the combined effects of both. This would enable more light to be shed on the role that different climate perceptions play in explaining employee mental health.

Implications for practice

Understanding how OC is associated with mental health outcomes is important because it provides information on how to prevent mental health problems occurring among health care staff. Our results have several implications.

First, our results indicate that there is a need to give attention to group relationships and group behavior within health care organizations. Empirical evidence indicates that aspects such as co-worker support and cohesion among colleagues are crucial in preventing mental illnesses among health care employees. Various means such as decreasing competition among co-workers and creating a strong set of standards that encourages co-workers' positive interactions could help achieve this (Chiaburu & Harrison, 2008). With the increased focus on team-based work and interactions among health care workers, the relationships between employees become increasingly important.

Further, our results indicate that leadership and supervision should not be ignored when seeking to support employees' mental health. Relationship-oriented leadership styles and behaviors play an important role in maintaining mentally healthy employees. Including competences such as showing concern and support in management development training can stimulate the development of relationship-focused leadership styles (Schreuder, 2011).

Another practical implication is that health care organizations that actively try to align their attempts to stimulate good leadership, group relationships, and communication, rather than merely invest in one of these OC dimensions, will probably see a stronger effect on the mental health of their employees.

To conclude, we see a need to expand occupational health and safety policies to include the social and interpersonal environment. If health care organizations want to successfully address mental health issues among their staff, our findings suggest that they will benefit from incorporating OC into their health and safety policies.

REFERENCES

* Study included in systematic review

Aarons, G.A. & Sawitzky, A.C. (2006). Organizational climate partially mediates the effect of culture on work attitudes and staff turnover in mental health services. *Administration and Policy in Mental Health and Mental Health Services Research, 33(3),* 289-301.

Aiken, L.H., Clarke, S.P., Sloane, D.M. (2002). Hospital staffing, organizational support and quality of care: cross-national findings. *International Journal of Quality in Health Care, 14*, 5-13.

*Aiken, L.H., Clarke, S.P., Sloane, D.M., Lake, E.T. & Cheney, T. (2008). Effects of Hospital Care Environment on Patient Mortality and Nurse Outcomes. *Journal of Nursing of Nursing Administration, 38(5),* 223-229.

*Akerboom, S. & Maes, S. (2006). Beyond demand and control: The contribution of organizational risk factors in assessing the psychological well-being of health care employees. *Work & Stress, 20(1)*, 21-36.

Ancarani, A., Di Mauro, C. & Giammanco, M.D. (2009). How are organisational climate models and patient satisfaction related? A competing value framework approach. *Social Science & Medicine*, 69(12), 1813–1818.

*Arnetz, B. & Blomkvist, V. (2007). Leadership, Mental Health, and Organizational Efficacy in Health Care Organizations: Psychosocial Predictors of Healthy Organizational Development Based on Prospective Data from Four Different Organizations. *Psychotherapy and Psychosomatics, 76*, 242–248.

*Arnetz, B.B., Lucas, T. & Arnetz, J.E. (2011). Organizational Climate, Occupational Stress, and Employee Mental Health: Mediating Effects of Organizational Efficiency. *Journal of Occupational and Environmental Medicine, 53(1),* 34-42.

*Bobbio, A. Bellan, M. & Manganelli, A.M. (2012). Empowering leadership, perceived organizational support, trust, and job burnout for nurses: A study in an Italian general hospital. *Health Care Management Review, 37(1)*, 77-87.

Bushman, B.J. & Wang, M.C. (1994). Vote-counting procedures in meta-analysis. In: Cooper, H., Hedges, L.V. & Valentine, J.C. (eds.). *The Handbook of Research Synthesis and Meta-Analysis*. Russell Sage Foundation, New York, pp: 207-221.

Chiaburu, D. & Harrison, D. (2008). Do Peers Make the Place? Conceptual Synthesis and Meta-Analysis of Coworker Effects on Perceptions, Attitudes, OCBs, and Performance. *Journal of Applied Psychology. 93(5)*, 1082-1103.

Clarke, S. (2006). The Relationship between Safety Climate and Safety Performance: A Meta-Analytic Review. *Journal of Occupational Health Psychology, 11(4),* 315–27.

Cummings, G.C., MacGregor, T., Davey, M., Lee, H., Wong, C.A., Lo, E., Muise, M. & Stafford, E. (2010). Leadership styles and outcome patterns for the nursing workforce and work environment: a systematic review. *International Journal of Nursing Studies, 47*, 363-385.

Danna, K. & Griffin, R.W. (1999). Health and well-being in the workplace: a review and synthesis of the literature. *Journal of Management, 25*, 357–384.

De Boer, J., Lok, A., Van ‘t Verlaat, E., Duivenvoorden, H.J., Bakker, A.B. & Smit, B.J. (2011). Work-related incidents in hospital-based health care providers and the risk of post-traumatic stress symptoms, anxiety and depression: a meta-analysis. *Social Science & Medicine, 73*, 316-326.

Denison, D.R. (1996). What is the Difference between Organizational Culture and Organizational Climate? A Native's Point of View on a Decade of Paradigm Wars. *The Academy of Management Review, 21(3),* 619-654.

Embracio, N., Papazian, L., Kenetish-Barnes, N., Pochard, F. & Azoulay, E. (2007). Burnout syndrome among critical care healthcare workers. *Current Opinion in Critical Care*, *13*, 482-488.

*Eriksen W., Tambs, K. & Knardahl, S. (2006). Work factors and psychological distress in nurses' aides: a prospective cohort study. *BMC Public Health, 6*, 290.

Fink, E. L. & Chen, S.-S. (1995). *A Galileo analysis of organizational climate. Human Communication Research, 21*, 494-521.

*Flynn, L., Thomas-Hawkins, C. & Clarke, S.P. (2009). Organizational Traits, Care Processes, and Burnout Among Chronic Hemodialysis Nurses. *Western Journal of Nursing Research, 31*, 569-582.

*Friese, C.R. (2005). Nurse Practice Environments and Outcomes: Implications for Oncology Nursing. *Oncology of Nursing Forum, 32(4)*, 765-772.

Gershon R.R.M., Stone P.W., Bakken S. & Larson, E. (2004). Measurement of Organizational Culture and Climate in Healthcare. *Journal of Nursing Administration, 34*, 33-40.

Gershon, R.R.M., Stone, P.W., Faucett, J., MacDavitt, K. & Chou, S.S. (2007). Organizational Climate and Nurse Health Outcomes in the United States: A Systematic Review. *Industrial Health, 45*, 622–636.

*Gunnasdottir, S., Clarke, S.P., Rafferty, A.M. & Nutbeam, D. (2009). Front-line management, staffing and nurse–doctor relationships as predictors of nurse and patient outcomes: A survey of Icelandic hospital nurses. *International Journal of Nursing Studies, 46,* 920–927.

*Hanrahan, N.P., Aiken, L.H., McClaine, L. & Hanlon, A.L. (2010). Relationship between Psychiatric Nurse Work Environments and Nurse Burnout in Acute Care General Hospitals. *Issues in Mental Health Nursing, 31(3)*, 198–207.

*Jenkins, R. & Elliot, P. (2004). Stressors, burnout and social support: nurses in acute mental health settings. *Journal of Advanced Nursing, 48(6)*, 622–631.

*Jolivet, A., Caroly S., Ehlinger, V., Kelly-Irving M., Delpierre, C., Balducci, F., Sobaszek, A., De Gaudemaris, R. & Lang, T. (2010). Linking hospital workers' organisational work environment to depressive symptoms: A mediating effect of effortereward imbalance? The ORSOSA study. *Social Science & Medicine, 71*, 534-540.

*Kawano, Y. (2008). Association of Job-related Stress Factors with Psychological and Somatic Symptoms among Japanese Hospital Nurses: Effect of Departmental Environment in Acute Care Hospitals. *Journal of Occupational Health, 50*, 79–85.

Kelloway, E.K. & Day, A.L. (2005). Building Healthy Workplaces: What We Know So Far. *Canadian Journal of Behavioral Science, 37(4)*, 223-235.

Kuenzi, M. & Schminke, M. (2009) Assembling fragments into a lens: A review, critique, and proposed research agenda for the organizational work climate literature. *Journal of Management, 35*, 634-717.

Letvak S., Ruhm C.J. & McCoy T. (2012). Depression in hospital-employed nurses. *Clinical Nurse Specialist, 26(3)*, 177-82.

Light, R.J. & Smith, P.V. (1971). Accumulating Evidence: Procedures for Resolving Contradictions Among Different Research Studies. *Harvard Educational Review*, 41(4), 429-471.

MacDavitt K., Chou, S.S. & Stone, P.W. (2007). Organizational climate and health care outcomes. *The Joint Commission Journal on Quality and Patient Safety, 22*, 45–56.

*Meeusen, V.C.H., Van Dam, K., Brown-Mahoney, C., Van Zundert, A.A.J. & Knape, H.T.A. (2011). Understanding nurse anesthetists' intention to leave their job: How burnout and job satisfaction mediate the impact of personality and workplace characteristics. *Health Care Management Review, 36(2)*, 155-163.

Michie, S., & Williams, S. (2003). Reducing work related ill-health and sickness absence: A systematic literature review. *Occupational and Environmental Medicine*, 60, 3–9.

Moran, E.T., & Volkwein, J.F. (1992). The cultural approach to the formation of organizational climate. *Human Relations, 45*, 19–4.

Neal, A., Griffin, M.A. & Hart, P.M. (2000). The impact of organizational climate on safety climate and individual behavior. *Safety Science, 34*, 99–109.

Panari, C., Guglielmi, D., Ricci, A., Tabanelli, M.C. & Violante, F.S. (2012). Assessing and improving health in the workplace: an integration of subjective and objective measures with the Stress Assessment and Research Toolkit (St.A.R.T.) method. *Journal of Occupational Medicine and Toxicology,* 7:18.

Parker, C.P., Baltes, B.B., Young, S.A., Huff, J.W., Altmann, R.A., Lacost, H.A. & Roberts, J.E. (2003). Relationships between psychological climate perceptions and work outcomes: a meta-analytic review. *Journal of Organizational Behavior, 24*, 389–416.

*Patrician, P.A., Shang, J. & Lake, E.T. (2010). Organizational Determinants of Work Outcomes and Quality Care Ratings Among Army Medical Department Registered Nurses. *Research in Nursing & Health, 33(2)*, 99–110.

Patterson, M., West, M., Shackleton, V., Dawson, J., Lawthom, R., Matlis, S., et al. (2005). Validating the organizational climate measure: Links to managerial practices, productivity and innovation. *Journal of Organizational Behavior, 26*, 379-408.

*Poncet, M.C., Toullic, P., Papazian, L., Kentish-Barnes, N., Timsit, J.F., Pochard, F., Chevret, S., Schlemmer, B., & Azoulay, E. (2007). Burnout Syndrome in Critical Care Nursing Staff. *American Journal of Respiratory Critical Care Medicine. 175*, 698–704.

Rosenthal, R. (1979). The 'file drawer problem' and tolerance for null results. *Psychological Bulletin, 86(3)*, 638-641.

Schluter, J., Winch, S., Holzhauser, K. & Henderson, A. (2008). Nurses' Moral Sensitivity and Hospital Ethical Climate: a Literature Review. *Nurse Ethics,15(3)*, 304-321.

Schmalenberg, C. & Kramer, M. (2009). Nurse-Physician Relationships in Hospitals: 20 000 Nurses Tell Their Story. *Critical Care Nurse, 29(1)*, 74-83.

Schneider, B., Ehrhart, M.G. & Macey, W.H. (2013). Organizational climate and culture. *Annual Review of Psychology, 64*, 361 - 388.

Schreuder, J.A.H.; Roelen, C.A.M., Van Zweeden, N.F., Jongsma, D., Van der Klink, J.J.L. & Groothoff, J.W. (2011). Leadership styles of nurse managers and registered sickness absence among their nursing staff. *Health Care Management Review. 36(1)*, 58-66.

Sleutel, M.R. (2000). Climate, Culture, Context, or Work Environment? Organizational Factors That Influence Nursing Practice. *The Journal of Nursing Administration, 30(2)*, 53-58.

Stansfeld S. & Candy, B. (2006). Psychosocial work environment and mental health—a meta-analytic review. *Scandinavian Journal of Work and Environmental Health, 32*, 443–62.

*Stone, P.W., Du, Y., Gershon, R.R. (2007). Organizational climate and occupational health outcomes in hospital nurses. *Journal of Occupational Environmental Medicine, 49*, 50–8.

Stordeur, S., D'Hoore, W. & The Next-Study Group. (2007). Organizational configuration of hospitals succeeding in attracting and retaining nurses. *Journal of Advanced Nursing, 57(1)*, 45–58.

*Vahey, D.C, Aiken, L.H., Sloane, D.M., Clarke, S.P. & Vargas, D. (2004). Nurse Burnout and Patient Satisfaction. *Medical Care. 42(2)*, II57–II66.

*Van Bogaert, P., Meulemans, H., Clarke, S., Vermeyen, K. & Van de Heyning, P. (2009). Hospital nurse practice environment, burnout, job outcomes and quality of care: test of a structural equation model. *Journal of Advanced Nursing, 65(10)*, 2175–2185.

Wallace, J., Hunt, J. & Richards, C. (1999). The relationship between organisational culture, organisational climate, and managerial values. *International Journal of Public Sector Management, 12*, 548–564.

West, M.A. & Anderson, N.R. (1996). Innovation in top management teams. *Journal of Applied Psychology, 81(6),* 680–693.

*Williams, E.S., Baier Manwell, L., Konrad, T.R. & Linzer, M. (2007). The relationship of organizational culture, stress, satisfaction, and burnout with physician-reported error and suboptimal patient care: Results from the MEMO study. *Health Care Management Review, 32(3)*, 203-212.

Wilson, M.G., DeJoy, D.M., Vandenberg, R.J., Richardson, H.A. & McGrath, A. (2004). Work characteristics and employee health and well-being: Test of a model of healthy work organization. *Journal of Occupational and Organizational Psychology*, 77, 565-588.

Wong, C.A. & Cummings, G.G. (2007). The relationship between nursing leadership and patient outcomes: a systematic review. *Journal of Nursing Management, 15(5)*, 508–521.

*Ylipaavalniemi, J., Kivimaki M., Elovainio, M., Virtanen, M., Keltikangas-Jarvinen, L., Vahtera J. (2005). Psychosocial work characteristics and incidence of newly diagnosed depression: a prospective cohort study of three different models. *Social Sciences & Medicine, 61*, 111–122.

APPENDIX

Table 1

Studies included in systematic review

	Study	Design	Sample setting and participants	Organizational climate measure	Mental health outcome measure	Results*
1	Jenkins & Elliot (2004)	Cross-sectional	93 nurses and nurse assistants in 4 English hospitals (39% response rate)	- Organizational structure and processes (MHPSS) - Conflicts with other professionals (MHPSS) - Support from supervisors (House & Wells, 1978) - Support from co-workers (House & Wells, 1978)	- Emotional exhaustion (MBI)	- Organizational structure and processes → emotional exhaustion (r= 0.46; p<0.001) - Conflicts with other professionals → emotional exhaustion (r= 0.46; p<0.001) - Support from co-workers → emotional exhaustion (r= -0.32; p<0.01)
2	Vahey et al. (2004)	Cross-sectional	820 nurses in 20 U.S. hospitals (86% response rate)	Nurse work environment (NWI-R): - Staffing adequacy - Administrative support - Nurse-physician relationship	- Emotional exhaustion (MBI)	Composite scale tested: - Positive nurse work environment → emotional exhaustion (OR= 0.59; p<0.05).
3	Friese (2005)	Cross-sectional	1,956 nurses in 22 U.S. hospitals (56% response rate)	Nurse work environment (PES-NWI): - Nurse participation in hospital affairs - Nurse manager ability, leadership and support for nurses - Collegial nurse-physician relation	- Emotional exhaustion (MBI)	- Manager ability → emotional exhaustion (B= -0.24; p<0.01) - Collegial nurse-physician relation → emotional exhaustion (B= -0.21; p<0.01)
4	Ylipaavalniemi et al. (2005)	Longitudinal	3,651 doctors, nurses, laboratory/x-ray staff, administrative staff, maintenance/cleaning staff in 12 Finnish hospitals (74% response rate (t1), 82% (t2))	Team climate (TCI): - Participation safety - Team support - Vision - Task orientation - Fairness of leadership	- Doctor diagnosed depression (Vahtera et al., 1997)	Composite scale tested: - Poor team climate → depression (OR= 1.75; p<0.05) - Perceived unfairness of leadership→ depression (OR= 1.24; p<0.05)
5	Akerboom & Maes (2006)	Cross-sectional	706 care staff, care assistants, managers and patient care coordinators in 3 Dutch nursing homes (43% response rate)	Organizational characteristics (ORFQ): - Communication - Social hindrance - Supervisor support - Co-worker support	- Psychological distress (SCL-90) - Emotional exhaustion (MBI-NL)	- Social hindrance → psychological distress (B= .19; p<0.05) - Social hindrance → emotional exhaustion (B= .24; p<0.01) - Supervisor support → psychological distress (B= -.17; p<0.05)

6	Eriksen et al. (2006)	Longitudinal	4,076 assistant nurses from different health care organizations in Norway (62.3% response rate (t1), 80.3% (t2))	Organisational work factors (QPSNordic) - Participation in important decisions - Supervisor support - Fairness of leadership - Feedback about quality of work - Social climate - Support and encouragement	- Psychological distress (SCL-5)	- Less support and encouragement → psychological distress (B= 0.14; p<0.05)
7	Arnetz & Blomkvist (2007)	Longitudinal	6,157 (t1) and 9,685 (t2) physicians, nurses, nurse assistants in 4 Swedish hospitals (58% response rate)	Organizational climate (QWC) - Work climate - Performance feedback - Participatory management	- Mental health (Warr, 1990)	- Work climate → mental health (B= 0.35; p<0.05)
8	Poncet et al. (2007)	Cross-sectional	2,392 nurses in 165 French hospital IC units (58% response rate)	- Relationship with head nurses - Relationship with physicians	- Burnout syndrome (MBI) - Depression (CES-D)	- Poor relationship with head nurses --> burnout syndrome (OR= 0.92; p< 0.05) - Poor relationship with physicians --> burnout syndrome (OR= 0.81; p<0.01)
9	Stone, Du & Gershon (2007)	Cross-sectional	2,047 nurses in 13 U.S. hospitals (50% response rate)	Organizational climate (PNWE): - Nursing management - Nurse/physician collaboration - Unit decision-making	- Emotional exhaustion (MBI)	- Nurse/physician collaboration → emotional exhaustion (B= -0.28; p<0.01) - Good nurse management → emotional exhaustion (B= -0.46; p<0.05)
10	Williams et al. (2007) Linzer et al. (2009)	Cross-sectional	426 physicians in 101 U.S. ambulatory clinics	Organizational culture (Kraleweski, 1996): - Leadership alignment - Informational emphasis - Cohesion	- Burnout (Bachman & Freeborn, 1999)	- Leadership alignment → burnout (direct effect OR= -0.49; p<0.05; also indirect effect via stress) - Information emphasis → burnout (OR= -0.33; p<0.05) - Cohesion → burnout (OR= -0.33; p<0.05)
11	Aiken et al. (2008)	Cross-sectional	10,184 nurses in 160 U.S. hospitals (52% response rate)	Care environment (PES of NWI-R): - Nursing foundations for quality of care - Nurse manager ability, leadership, and support - Collegial nurse/physician relations	- Emotional exhaustion (MBI)	Composite scale tested: - Care environment → emotional exhaustion (OR= 0.76; p<0.05)
12	Kawano (2008)	Cross-sectional	1,551 nurses in 4 Japanese hospitals (92% response rate)	Work environment (Shimomitsu et al., 2000): - Workplace environment - Interpersonal relationships - Support from supervisor - Support from co-workers	- Anxiety (Shimomitsu et al., 2000) - Depression (Shimomitsu et al., 2000)	- Interpersonal relationships → anxiety (B= -0.13; p<0.001) - Interpersonal relationships → depression (B= -0.30;p<0.001) - Workplace environment → depression (B= -0.11 p<0.001) - Supervisor support → anxiety (B= -0.13; p< .001) - Supervisor support → depression (B= -0.26; p<0.001) - Coworker support →anxiety (B= -0.12; p<0.001) - Coworker support → depression (B= -0.21; p<0.001)
13	Flynn, Thomas-Hawkins & Clarke (2009)	Cross-sectional	422 nephrology nurses in U.S. private practices and hospitals (52% response	Supportive practice environment (PES of NWI-R): - Nurse participation in hospital affairs	- Emotional exhaustion (MBI)	Composite scale tested: - Poor practice environment → emotional exhaustion (OR= 4.60; p<0.01)

			rate)	- Nursing foundations for quality of care - Nurse manager ability, leadership, and support - Collegial nurse-physician relation - Staffing and resource adequacy		
14	Gunnarsdottir et al. (2009)	Cross-sectional	695 nurses in 98 Icelandic hospital wards (75% response rate)	Nurse work environment (NWI-R): - Nurse-physician relations - Unit-level support - Hospital-level support	- Emotional exhaustion (MBI)	none
15	Van Bogaert et al. (2009)	Cross-sectional	401 nurses in 2 Belgian hospitals (58% response rate)	Practice environment (NWI-RVL): - Nurse-physician relation - Nurse management at the unit level - Hospital management	- Emotional exhaustion (MBI)	- Nurse-physician relation → emotional exhaustion (B= -0.19; p<0.05) - Hospital management → emotional exhaustion (B= -0.26; p<0.05)
16	Hanrahan et al. (2010)	Cross-sectional	353 psychiatric nurses in 67 U.S. hospitals (52% response rate)	Nurse work environment (PES-NWI): - Nurse participation in hospital affairs - Foundations for quality of care - Manager skill at leadership - Nurse-physician relationship	- Emotional exhaustion (MBI)	Composite scale tested: - Positive work environment → emotional exhaustion (B= -10.34; p<0.001) Subscales tested: - Nurse-physician relationship → emotional exhaustion (B= -6.10; p<0.001) - Management leadership → emotional exhaustion (B= -4.46; p<0.001)
17	Jolivet et al. (2010)	Cross-sectional	3,316 nurses and nurse assistants in 7 French hospitals (91% response rate)	Organizational work environment (NWI-EO): - Communication in the work unit - Support from the senior nurse - Relationship between workers - Respect of planned days off and vacations	- Depressive symptoms (CES-D)	- Relationship between workers → depressive symptoms (B= -0.26; p<0.01) - Communication in the work unit → depressive symptoms (indirect via perceptions of effort-reward imbalance)
18	Patrician, Shang & Lake (2010)	Cross-sectional	812 civilian and military nurses in 23 U.S. hospitals (53% response rate)	Practice environment (PES-NWI): - Nurse participation in hospital affairs -Nursing foundations for quality of care - Nurse manager ability, leadership and support - Staffing and resources adequacy - Collegial nurse-physician relation	- Emotional exhaustion (MBI)	Composite scale tested: - Poor practice environment → emotional exhaustion (OR= 12.70; p<0.01)
19	Arnetz, Lucas & Arnetz (2011)	Cross-sectional	5,316 physicians, nurses and nurse assistants in 4 Swedish hospitals (45% response rate)	Organizational climate (QWC): - Social Climate - Participation - Performance Feedback	- Mental health (Warr, 1990)	- Social climate → mental health (B= .16; p< 0.01) - Participation → mental health (B= .09; p< 0.01) - Performance feedback → mental health (indirect via organizational efficacy)

20	Meeusen et al. (2011)	Cross-sectional	882 nurse anesthetists in various Dutch hospitals and private clinics (46% response rate)	- Social environment (Van Orden & Gaillard, 1994) - Relation with supervisor (Van Orden & Gaillard, 1994) - Work climate (Buckingham & Coffman, 2006)	- Burnout (MBI)	- Social environment → burnout (B= -.18; p<001) - Work climate → burnout (B= -.36; p<0.001)
21	Bobbio, Bellan & Manganelli (2012)	Cross-sectional	273 nurses in an Italian hospital (57% response rate)	Empowering leadership (ELQ): - Leading by example - Participative decision-making - Coaching - Informing - Showing concern/interaction with team Trust (OTI): - Trust in the leader	- Emotional exhaustion (MBI-GS)	- Trust in leader → emotional exhaustion (B= -.32; p<0.05) - Informing leadership → emotional exhaustion (indirect via trust in organization) - Leading by example → emotional exhaustion (indirect via trust in leader) - Leader showing concern/interaction with team → emotional exhaustion (indirect via trust in leader)

TABLES

Table 2

Summary of quality assessment of included studies

	DESIGN	NO	YES
1.	Was the study prospective?	18	3
2.	Was probability sampling used?	16	5
	SAMPLE		
3.	Was sample size appropriate?	0	21
4.	Was sample drawn from more than one site?	2	19
5.	Was anonymity protected?	3	18
6.	Response rate more than 60%?	13	8
	MEASUREMENT		
7.	Was organizational climate measured reliably?	5	16
8.	Was organizational climate measured using a valid instrument?	2	19
9.	Was employee mental health observed rather than self-reported? (0 scored for self-report, 1 for observed, 2 for both)	21	0
10.	If a scale was used to measure variables, is internal consistency at least 0.70?	5	16
11.	Was a theoretical model/framework used for guidance?	10	11
	STATISTICAL ANALYSIS		
12.	Were correlations analyzed?	0	21
13.	Were outliers managed?	19	2
	TOTAL QUALITY RATING: **LOW (0-4)** **MEDIUM (5-9)** **HIGH (10-14)**	**TOTAL QUALITY SCORE:** **Medium:** Score of 6 (2 studies) Score of 7 (7 studies) Score of 8 (7 studies) Score of 9 (3 studies) **High:** Score of 10 (2 studies)	

Table 3

Summary of total quality scores of included studies

Study	**Total quality score (scale 0-14)**
Jenkins & Elliot (2004)	9
Vahey et al. (2004)	8
Friese (2005)	7
Ylipaavalniemi et al. (2005)	10
Akerboom & Maes (2006)	7
Eriksen et al. (2006)	10
Arnetz & Blomkvist (2007)	8
Poncet et al. (2007)	6
Stone, Du & Gershon (2007)	7
Williams et al. (2007) & Linzer et al. (2009)	6
Aiken et al. (2008)	8
Kawano (2008)	8
Flynn, Thomas-Hawkins & Clarke (2009)	9
Gunnarsdottir et al. (2009)	7
Van Bogaert et al. (2009)	8
Hanrahan et al. (2010)	9
Jolivet et al. (2010)	7
Patrician, Shang & Lake (2010)	8
Arnetz, Lucas & Arnetz (2011)	7
Meeusen et al. (2011)	8
Bobbio, Bellan & Manganelli (2012)	7
Mean Total Quality Score	**7.8**

FIGURES

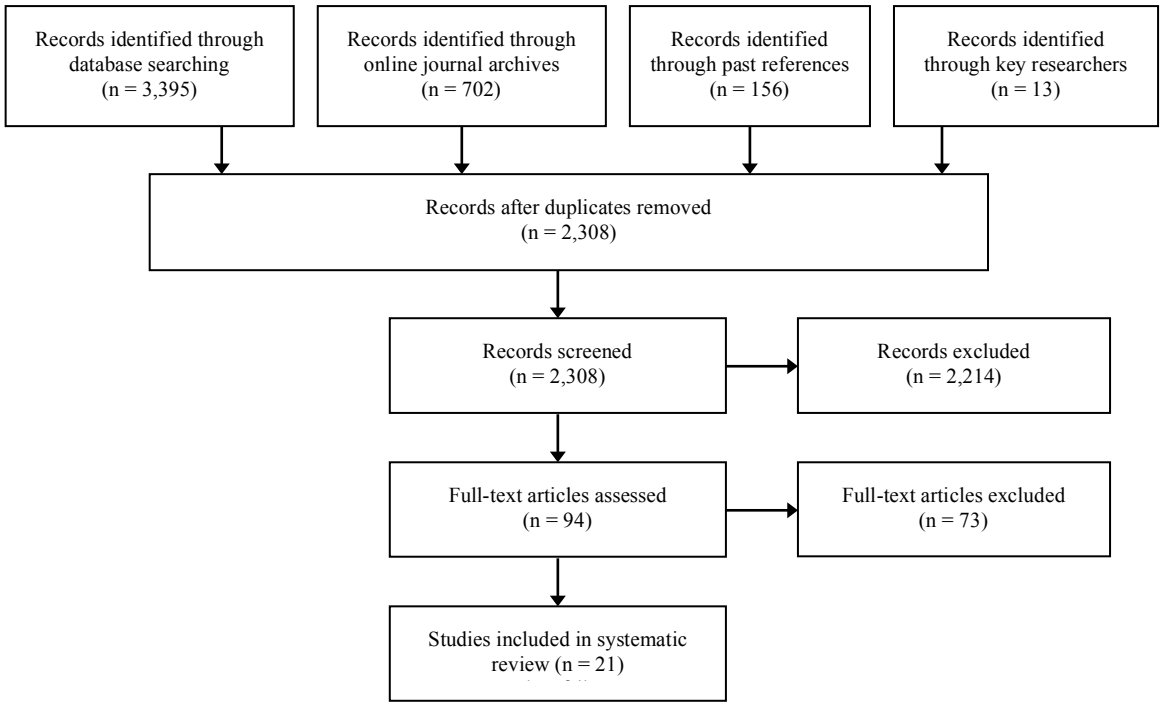

Figure 1

Flow Diagram of Study Selection

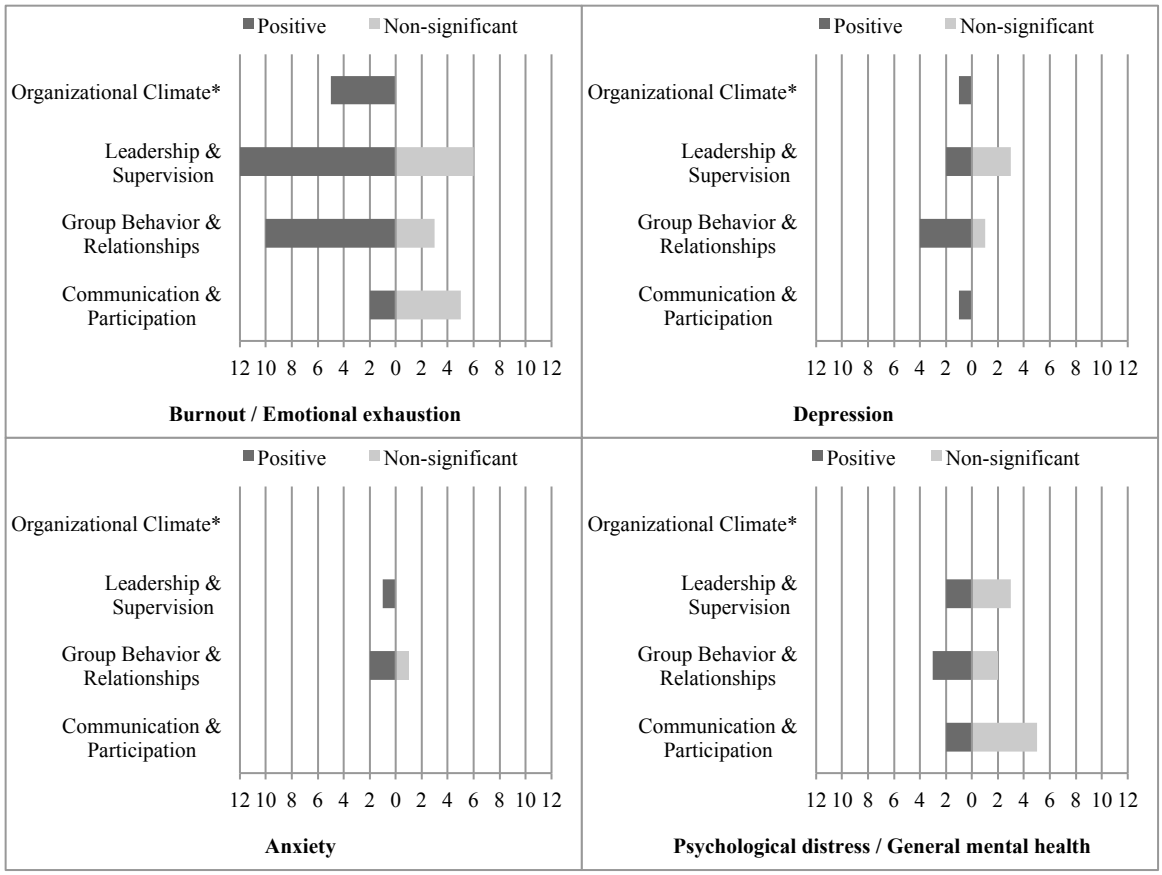

Figure 2

Results of data analysis. Each analysis of a mental health outcome casts one 'vote' for every organizational climate dimension it includes. The sign of the vote reflects whether the association of the organizational climate dimension and mental outcome is positive or non-significant. *Organization Climate refers to a composite climate scale.

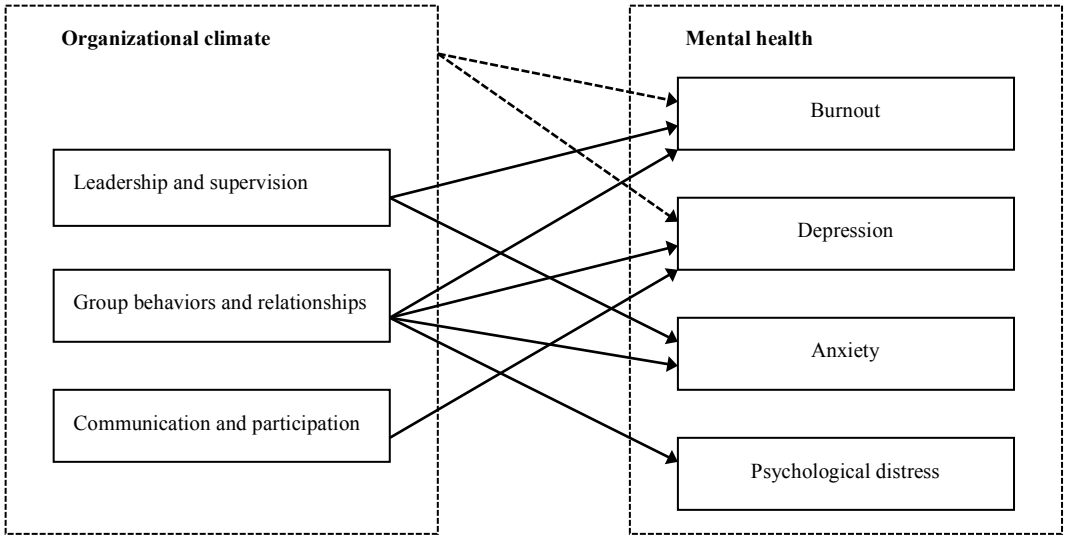

Figure 3

Theoretical model resulting from systematic review.