

MSc Management in Health Care Dissertation

A critical literature review for investigating how
nurse practice environment affect nurse
burnout and quality of care

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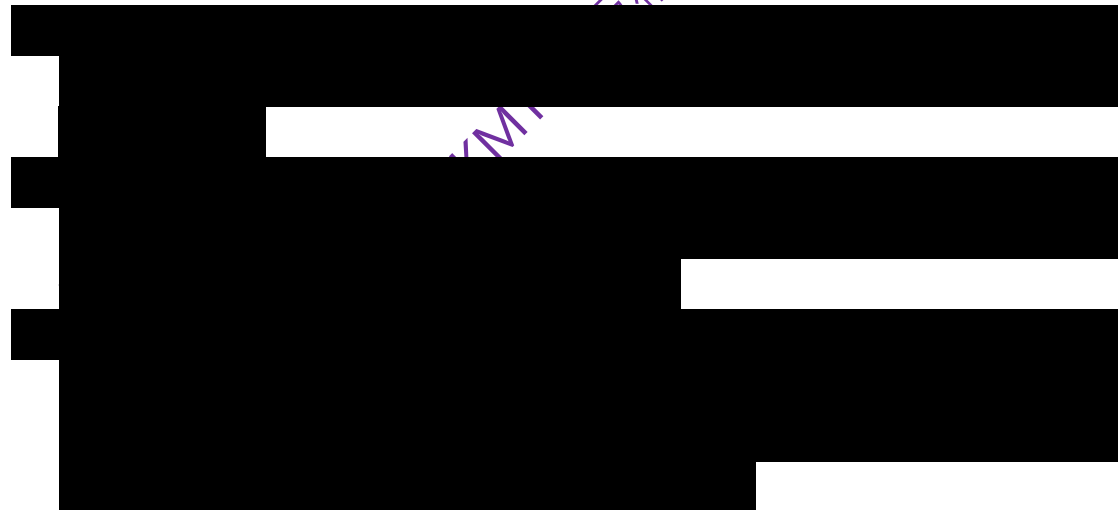
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Abstract

This critical literature review seeks to answer three research questions. First, the inter-relationship between the dimensions in nurse practice environment, burnout and quality of care. Second, the dimensions in nurse practice environment has greater impact or smaller impact on nurse burnout and quality of care. Third, the methods that hospital can improve nurse practice environment to reduce nurse burnout and improve quality of care.

Based on the process of critical literature review, four themes were generated. They are:

- Research articles generally pointed out that good nurse practice environment lead to reduced burnout and better quality of care, regardless of whether these research articles investigated both burnout and quality of care and whether they use the same terms.



Based on these themes, it was recommended that nurse management should improve nurse practice environment, especially, nurse management at unit level to achieve lesser burnout and quality of care. Second, nurse workloads should be reduced by measures at the top government level, hospital level training and recruitment and nurse unit-level procedures and workflow improvement. The weaknesses and ethical considerations of this research was also discussed.

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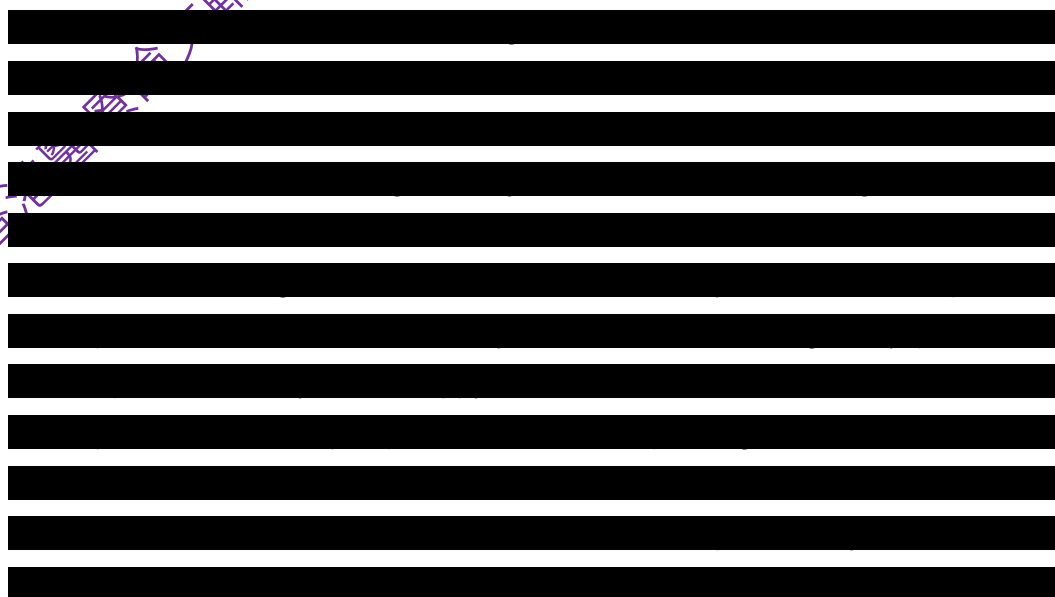
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1. Introduction

This chapter aims at establishing the objectives, research questions and a brief background for this research studies. As a nurse supervisor working in public hospital, it was found that burnout and a loss of work appetite are ubiquitous issues among nurses. It happens among new nurse graduates, nurses working for several years and veteran nurses. It covers all level of nurse professionals. From a layman view, nurse burnout affects the work efficiency and effectiveness which in turns affects the quality of care offered by nurses. Research studies have found relationship between nurse burnout and quality of care (Aiken et al, 2002; Bogaert et al, 2013; Poghosyan et al, 2010). The major factor affecting nurse burnout and quality of care is nurse practice environment (Van Bogaert, 2009; Leiter et al, 2006; Laschinger et al, 2009). Therefore, this research aims at investigating how (i) the inter-relationship between the dimensions in nurse practice environment, burnout and quality of care and (ii) which dimensions in nurse practice environment has greater impact or smaller impact on nurse burnout and quality of care.

1.1. A brief conceptual framework of burnout, nurse burnout and quality of care among nurses

Burnout is a prolonged response to chronic emotional and interpersonal stressors on the job and is defined by three dimensions, namely, exhaustion, cynicism and inefficacy (Maslach, et al, 2001). Cynicism and inefficacy can also be called depersonalization and reduced personal accomplishment (Maslach et al, 2001).



conflict and disruption to job task (Maslach et al, 2001). Another outcome is on health such as anxiety, depression, drop of self-esteem and physiological health indicators (Maslach et al, 2001).

Nursing is a profession that is susceptible to burnout syndrome because of a lack of nurse in response to increasing job demand from aging population (United Nations, 2017). Along with a lack of support from supervisors and co-workers, it leads to nurse burnout. Nurse burnout has been a popular subject of studies for the last 20 years (Aiken et al, 2002; Cimiotti et al, 2012; Vahey et al, 2004). It has

[REDACTED]

Quality of care is an attribute that is measured by multiple measures such as number of hours of care provided by registered nurses instead of licensed nurses and nurses' aid, length of stay and rate of failure to rescue, life expectancy, burden to patients and caregivers and quality of life (Needleman, et al, 2002; Boyd et al, 2005). Since this research is about how nurse practice environment affects of quality of care, it is important to indicate the meaning of quality of care in this chapter.

1.2. The relationship between nurse practice environment and nurse burnout, as well as, quality of care

Research studies have consistently found the impact of nurse practice environment in hospital on quality of care, burnout and intention to leave (Aiken et al, 2012; Aiken et al, 2002a; Aiken et al, 2002b).

Nurse practice environment has been widely measured by the Nursing Work Index (NWI) (Aiken et al, 2000; Lake, 2002). Utilizing data from a large U.S. sample of 11,636 Pennsylvania nurses in 1985-1986, Lake (2002) grouped the items in NWI into five factors, namely, nurse participation in hospital affairs; nursing foundations for quality of care, nurse manager ability, leadership and support, staffing and

resource adequacy and collegial nurse-physician relationship. They measure the extent to which nurses felt they had an impact on overall hospital administration, the hospital's support for nursing model of care, key elements of leadership, adequacy of resources and staffing and working relations between doctors and nurses respectively (Lake, 2002). As different researchers have found, the interaction of different factors and allocation of different factors as independent variables, mediating roles and outcomes may provide slightly different causal relationship among different factors and outcomes (Van Bogaert et al, 2009; Van Bogaert et al, 2013; Leiter and Laschinger, 2006).

1.3. Explanations of the aims and objective of this study

Research studies have consistently found the relationship between nurse practice environment, burnout and quality of care (Aiken et al, 2002a; Aiken et al, 2002b). It is important to investigate which dimensions of nurse practice environment has

[REDACTED]

[REDACTED]. For example, it is important to identify which dimensions in nurse practice environment affect nurse burnout and quality of care the most and their interrelationships instead of simply concluding nurse practice environment has it relationship with burnout and quality of care.

The following objectives are identified to achieve the aim of the study:

- To conduct a critical literature review by searching, critically appraising and analyzing relevant literatures;
- To obtain background knowledge of nurse practice environment, nurse burnout and quality of care;

[REDACTED]

The following research questions are proposed:

- What is the inter-relationship between the dimensions in nurse practice environment, burnout and quality of care
- Which dimensions in nurse practice environment has greater impact or smaller impact on nurse burnout and quality of care.
- How should hospitals improve nurse practice environment to reduce nurse burnout and improve quality of care?

1.4. Dissertation Layout

This dissertation is organized into eight chapters. Chapter one offers a brief background for the research study and establish the aims, objectives and research questions for this study. Chapter two offers the background for this research. Chapter three describes the methodology of this research study. Chapter four describes the specific method of this research. Chapter five offers a review and summary critique for the chosen research articles using a critical appraisal framework. Chapter six analyzes the research articles chosen and divide the contents of the research articles into themes and sub-themes. Chapter seven offers recommendations for improving nurse practice environment, implication for practice, limitation and future directions for research study. The final chapter offers a summary for the research findings and recommendations.

2. Background

This chapter gives a background of the research. They encompass a description of burnout (including definition, dimensions, process, correlates, impact and solutions), quality of care indicators and Hong Kong situation.

2.1. Hong Kong Situation of Burnout

Hong Kong is an international city with a population of approximately 7.3 million (Department of Health, 2017). However, there has been a concern for a shortage of healthcare professionals because of inadequate number of health care graduates and high staff turnover rate in public health care system. It is projected that by 2030, there will be a shortage of over 1,000 doctors and 1,600 nurses because of aging population (Hong Kong Government, 2017). In recent years, the shortage of doctors and nurses has been standing between 250-340 and 500-800 respectively, signifying a health care problem of certain degree (Hong Kong Government, 2017).

In Hong Kong, the Sentinel Event Policy and Serious Untoward Event Policy were implemented in 2007 and 2010 respectively to report, measure and control for serious medical incidents in Hospital Authority, the managing authority of public hospitals in Hong Kong. Sentinel Events are defined as adverse events resulting in permanent loss of function or death. Serious untoward events are defined as events that could have led to death or permanent harm (Hospital Authority, 2018).

Upon the implementation of sentinel events reporting in 2007, there had been a steady declining trend of medical incidents from 2.7 per 1,000,000 episodes of patient attendances/ discharges and death in 2007 to 1.4 in 2013. However, possibly due to manpower shortage, the number climbed from 1.4 in 2013 to 1.9 in 2017. It signifies that the declining trend of medical incidents cannot continue. Although a general declining trend of serious untoward events was shown, the trend of sentinel events is not very desirable as this kind of event is of the life of patients (Hospital Authority, 2018).

Three studies in the past 15 years have confirmed the existence of burnout or depression, anxiety, symptoms of stress among Hong Kong nurses and nursing

students (Cheung and Yip, 2015; Lee et al, 2007; Watson et al, 2008)

Therefore, it is important to find out the causes for nurse burnout in Hong Kong by utilizing the best studies of Hong Kong and the rest of the world. Moreover, it is important to find out effective interventions for burnout among nurses.

2.2. Definition of burnout

Burnout is defined as “a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who do “people work” of some kind” (Maslach et al, 1986). This is the most popularly cited definition of burnout. A less well-known but more precise definition of burnout was proposed by Brill (1984, p.15): “Burnout is an exceptionally mediated, job-related, dysphoric and dysfunctional state in an individual without major psychopathology who has (1) functioned for a time at adequate performance and affective levels in the same job situation and who (2) will not recover to previous levels without outside help or environmental rearrangement.” From the analysis of these definitions, we can find that five elements exist in burnout.

- Dysphoric symptoms;
- The major symptoms are on mental and behavioral symptoms;
- It is generally work-related;
- It is observed in “normal” individuals;
- It leads to decreased and work performance because of negative attitudes and behaviors (Maslach et al, 1986).

2.3. The dimensions of burnout

There are three dimensions of burnout, namely, emotional exhaustion, depersonalization and reduced personal accomplishment (Maslach et al, 2001). Exhaustion means increased feelings of emotional exhaustion. It can be manifested by a depletion of emotional resources with workers feeling that they are no longer able to give of themselves at a psychological level. Cynicism or depersonalization means negative, cynical attitudes and feelings about one's clients. The dehumanized perceptions of one's client lead staff members to view them as deserving of their troubles. Inefficacy or reduced personal accomplishment refers to the tendency to evaluate oneself negatively (Maslach et al, 1986).



Inefficacy or reduced personal accomplishment is, however, not developed sequentially with exhaustion and depersonalization. It can develop parallel with them and it is arisen from a lack of relevant resources in workplace. In other words, it is caused by chronic and overwhelming demands in workplace (Maslach et al, 2001).

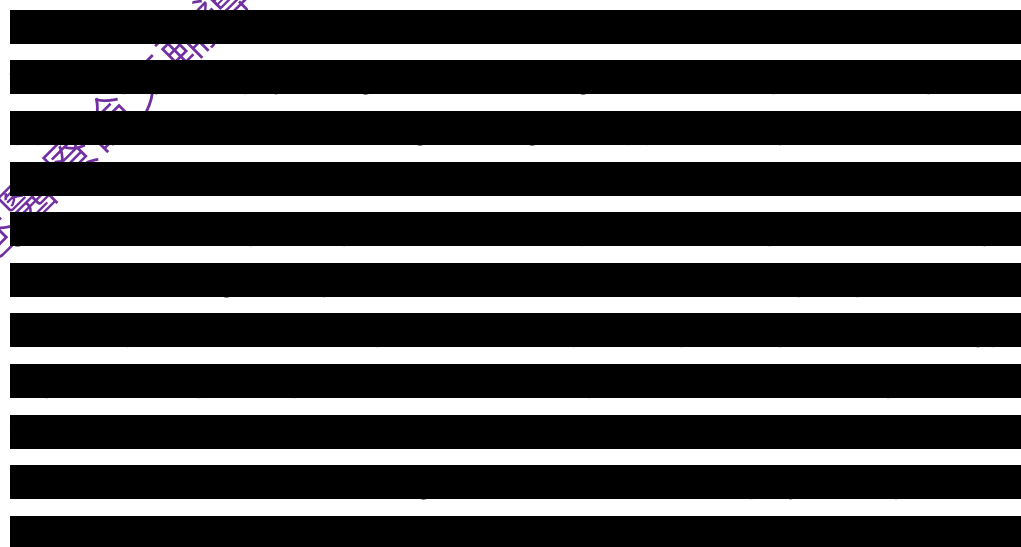
2.4. The process of burnout

There are three alternative models that describe the process of burnout. The first one is the phase model developed by Golembiewski and Munzenrider (1988). As its name implies, the development of burnout is divided into different phases. It goes from low in emotional exhaustion, depersonalization and personal accomplishment to high in all three dimensions which are divided into eight phases (Golembiewski and Munzenrider, 1988). However, this model is not without limitations. The limitation is that it is driven by a single dimension of emotional exhaustion. In other words, the development of phases correlates

with the development of emotional exhaustion. With higher level of emotional exhaustion, the level of burnout in other dimensions is also higher. Besides, some phases in this model are rare to happen such as phase 2 (high in depersonalization, low in emotional exhaustion and low in personal accomplishment) and phase 6 (high in emotional exhaustion and high in depersonalization and low in personal accomplishment). It reduces its reliability and validity (Leiter, 2017).

An alternative model is that burnout as a development process. In this model, burnout stems from work overload and dull routine and interpersonal conflict which lead to emotional exhaustion. As emotional exhaustion intensifies, it leads to depersonalization. However, the lowering of personal accomplishment is depended on the (i) level of supervisor and coworker support, (ii) skill building and effective coping, (iii) client cooperation and autonomy and (iv) participative decision making. If all these four factors are increased, the chance of lack of personal accomplishment is lower.

Another model is based on the job demands-resources model (JD-R model) of burnout (Demerouti et al, 2001, Bakker et al, 2005). There are two components in this model, namely, job demands and job resources. Job demand is referred to those physical, social or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain



relationship with their supervisor (Bakker et al, 2005). However, the limitation of this model is that it does not provide a connection to decreased personal

accomplishment. It only confirms the interaction between job demand, job resources, exhaustion and depersonalization but not decreased personal accomplishment. It is because the hypothesis was rejected for reduced professional efficacy (Demerrouiti et al, 2001; Bakker et al, 2005).

2.5. Correlates of burnout--- job characteristics and organizational environment

In studies, job characteristics such as high workloads, role ambiguity, role

[REDACTED]

[REDACTED]

[REDACTED]

Role ambiguity occurs when there is a lack of adequate information to do the job well. Role conflict occurs when conflicting demands at the job must be met (Maslach et al, 2001).

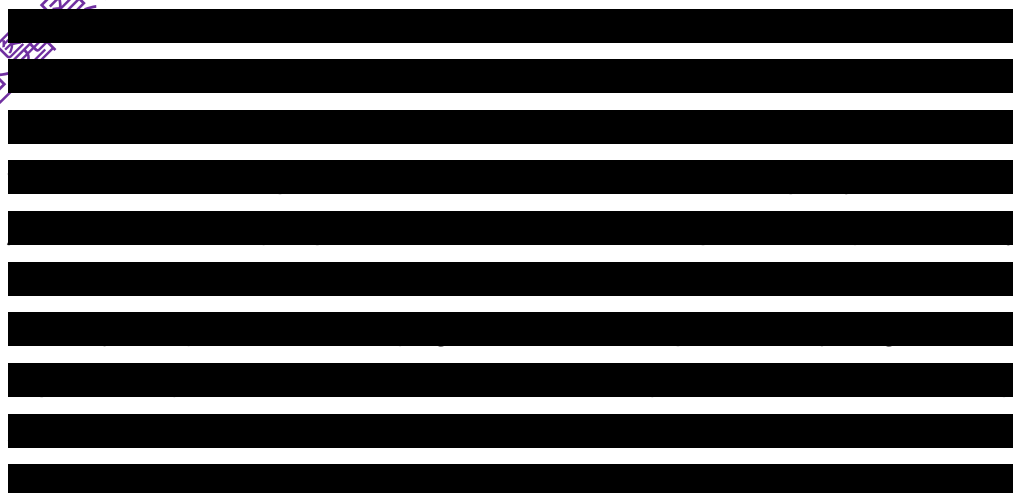
In terms of job characteristics, nurse professions are susceptible to all four predictors of burnout such as high workloads, role ambiguity, role conflict and severity of client's conditions. High workloads can be easily perceived by a layman because of the nurse manpower shortage in many parts of the world, especially Hong Kong manifested by a manpower shortage in Hospital Authority. The manpower shortage of nurses in Hong Kong Hospital Authority had been between 500-800 from year 2012-13 to year 2016-17 (Hong Kong Government , 2017). Severity of client's conditions can also be easily perceived

because of severe medical symptoms and conditions of some patients especially those in intensive care units. As for role conflict and role ambiguity, nurse professions often face inconsistent requirements for the job, for example, nurses are supposed to take good care of patients. However, nurse managers may ask nurses to take care of all patients assigned quickly to deal with manpower shortage. It results in an inadequate care for some patients. This results in role conflict. Role ambiguity may occur when a nurse does not have an idea of what level of care is required for a specific patient is acceptable (Tunc, 2009).

Because of the presence of all four job characteristics predicting burnout, nurse professionals are more susceptible to burnout as shown in research studies. Researchers have consistently found that role ambiguity and role conflicts lead to burnout for nurses (Tummers et al, 2002; Garrosa et al, 2010; Ohue et al, 2011; Lee et al, 2011). Researchers have also consistently found the relationship of hospital nurse staffing level and nurse burnout (Aiken et al, 2002a; Aiken et al, 2002b; Greenglass et al, 2001; Cimiotti et al, 2012).

2.6. Impact of Burnout

Negative impacts of burnout include nurse turnover intentions, reduction in quality of care and patient satisfaction (Laschinger et al, 2009; Vahey et al, 2004; McHugh et al, 2011; Cimiotti et al, 2012; Leiter and Maslach, 2009; Janssen et al, 1999; Aiken et al, 2002a; Aiken et al, 2002b; Poghosyan et al, 2010; Van Bogaert et al, 2014).



leads to depersonalization and depersonalization leads to turnover intention (Leiter and Maslach, 2009). Janssen et al (1999) also attempted to study the relationship between intrinsic work motivation, burnout and turnover intention. They found that mental work overload and lack of social support predict emotional exhaustion and emotional exhaustion leads to turnover intention while unmet career expectation directly predicts turnover intention. It shows a relationship between burnout and turnover intention. Similar results were also found in Laschinger et al (2009).

As for reduction of quality of care and patient satisfaction, Aiken et al (2002a), utilizing the data of 10,184 staff nurses serving in general, orthopedic and vascular surgical units surveyed, found that nurses are more likely to experience burnout and job dissatisfaction in hospitals with high patient-to-nurse ratios. Quality of care also reduced since surgical patients experienced higher risk-adjusted 30-day mortality and failure-to-rescue rates. Similarly, Aiken et al (2002b), utilizing the data from 10,319 nurses in USA, Canada, England and Scotland, found that nurses were three times more likely to report low quality of care in hospitals with low staffing and support when compared with hospitals with higher staffing and support. Nurses are more likely to experience burnout in hospitals with lower staffing. Moreover, Poghosyan et al (2010) found that nurses with higher level of burnout were likely to be reported with lower quality of care among 53,846 nurses in six countries, namely, USA, Canada, Germany, New Zealand, Japan and Scotland. Similar results were found in McHugh et al (2011). Moreover, Van Bogaert et al (2014) also found that perceived unit variation of nurse work characteristics such as workload, decision latitude predicted burnout and adverse patient events such as complaints from patients and family, patient falls, nosocomial infections and medication errors. Furthermore, Cimiotti et al (2012), utilizing the data of 7,076 registered nurses in 161 hospitals in Pennsylvania, found that nurse burnout caused by high patient-to-nurse ratio led to more urinary tract infection and surgical site infection. It was also estimated that hospital where burnout was reduced by 30% had 6,239 fewer infections, leading annual cost saving of up to \$68 million. Finally, less burnout also led to higher patient satisfaction (Vahey et al, 2004).

Overall, the above descriptions show an overwhelming and straightforward evidence on how burnout negatively affects nurse turnover intention and quality of care, for example, reported lack of quality of care by patients and caregivers and actual medical incidents and infections. It shows that burnout has actual implications on manpower loss and quality of healthcare. Its impact can be far reaching if the level of burnout is high in some settings. These researches were also conducted in many developed countries which provide relevant and validity of applications in at least developed countries.

On the other hand, these literatures suggested that the research objectives are worthwhile to pursue. It is because section 2.4. "Correlates of burnout--- job characteristics and organizational environment" and section 2.5 "impact of burnout" suggested that two probable relationship (i) undesirable job characteristics and organizational environment lead to burnout, (ii) burnout leads to reduction in quality of care and patient dissatisfaction. It connects the research objectives of (i) investigating the inter-relationship between the dimensions in nurse practice environment, burnout and quality of care and (ii) exploring which dimensions in nurse practice environment has greater impact or smaller impact on nurse burnout and quality of care.

2.7. Interventions of Burnout for Nurses

Interventions of burnout for nurses is divided into individual basis and organizational basis (Maslach et al, 2001). As for individual basis, techniques such as cognitive-behavioral techniques such as stress inoculation training, rational emotive therapy, cognitive restructuring and behavioral rehearsal are applied (Edelwich and Brodsky, 1980). This kind of intervention is helpful since burnout often involves unrealistic expectations and false hopes. Other techniques such as psycho-educational intervention, relaxation technique, mindfulness-based stress reduction intervention, time management, physical training, dieting and increasing one's social skills are also applied (Maslach, 1982; Jaffe and Scott, 1989; Mackenzie et al, 2006; Kravits et al, 2010).

As for the effectiveness of individual-based interventions, stress inoculation training, didactic stress management and training of coping skills are found to

be effective in reducing burnout significantly (Freedy and Hobfoll, 1994; West et al, 1984). Stress coping skills improvements were also significant for mindfulness-based stress reduction intervention and psycho-educational intervention (Mackenzie et al, 2006; Kravits et al, 2010).

As for organizational-based intervention, work redesign (e.g. job enlargement, job rotation and job enrichment), introductory mentorship programs and regular consultations and meetings are mentioned as method to reduce burnout syndrome in an organizational basis (Pines and Maslach, 1978; Cherniss, 1980). It was found that organizational-based interventions are effective in reducing burnout (Awa et al, 2010).

Overall, although researchers did not pay as many researchers focus on interventions as the impact of burnout in interventions, it is found that the interventions were overall effective.

2.8. Measures of quality of care

Quality of care is defined as effective, efficient, accessible, patient-centered, equitable and safe health care delivery (World Health Organization, 2006). There are four types of measurement tools of quality of care, namely, structure, process, outcome and patient experience. Structure measure is referred to an assessment of characteristics of a care setting, including personnel, policies and facilities. Process measure is referred to as whether services provided to patients are consistent with routine clinical care. Outcome measure is to evaluate patient health because of the care received. Patient experience measure to measure feedbacks from patients on their experience of care (FamiliesUSA, 2014)

Example of structure measure is whether an intensive care unit have a critical care specialist on staff at all time. Example of process measure is whether a doctor ensure that patients receive recommended cancer screenings. Example of outcome measure is survival rate and infection rate. Example of patient experience is number of complaints made by patients (FamiliesUSA, 2014).

It is important what the dimensions of quality of care are to recognize whether the chosen literatures are evaluating quality of care.

2.9. Chapter Conclusion

This chapter provides a detailed discussion of burnout, its impact and some interventions available. More importantly, it is found that, due to aging population and nurse manpower shortage, burnout is a serious problem in Hong Kong. It is vital to find out the cause of burnout and effective interventions for better quality of care in Hong Kong.

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3. Methodology

This chapter will describe the methodology of this research---critical literature review. It provides the rationale for using this methodology, a brief description of it and the stages of conducting critical literature review.

3.1. Research Paradigms

Research paradigm is a view of the world. It describes how researchers view how the world “works” and a perspective on the mechanism of the complexity of the world (Polit and Beck, 2014). There are three considerations in research paradigms, namely, epistemological consideration, ontological consideration and methodological consideration (Polit and Beck, 2014). All three considerations are utilized in this dissertation.

3.1.1. Epistemological Consideration

This consideration is divided into two distinct paradigms, namely, positivist and constructivist. Positivists believe that only one reality exists and there is a real world driven by real natural causes while constructivists believe that reality is multiple and subjective and mentally constructed by people or researchers (Polit and Beck, 2014).

As for the relationship between researcher and those being researched, positivists believe researchers are independent of those matters that are being researched while constructivists believe that the researchers are not independent of those being researched. Constructivists seek to interact with those matters being researched. Findings are therefore created in the interactive process (Polit and Beck, 2014).

As for the difference between objectivity and subjectivity, positivists sought a high level of objectivity. Values and biases are to be held in check. Constructivists allow subjectivity as long as the values are desirable and inevitable (Polit and Beck, 2014).

As for the best methods of obtaining evidence, positivists make use of deductive processes, namely, hypothesis testing. Hypothesis testing means a process of testing whether a null hypothesis should be rejected in favor of an alternative hypothesis. Null hypothesis is a hypothesis that does not violate the assumptions. As detailed in methodological consideration, quantitative methodological consideration is often applied in positivist paradigm (Polit and Beck, 2014).

Constructivists apply inductive processes, namely, hypothesis generation and make use of mostly qualitative research method in methodological consideration (Polit and Beck, 2014)

Some researchers believe that pure positivism is too difficult to apply. Therefore, positivism is divided into strict positivism and post-positivism. Strict positivism is a positivism that total objectivity is sought while post-positivism believes that total objectivity is, under some circumstances, impossible. It does not see total objectivity as an end. Instead, it sees total objectivity as a goal to strive for (Mackenzie and Knipe, 2006).

Applying to the research methodological consideration of critical literature review, post-positivism under positivism is applied. Under critical literature review, the researcher selects research articles, analyze and synthesize them. In the process of analyzing and synthesizing, total objectivity is a goal to strive for instead of an end since human judgement is invariably subject to bias. Besides, as this research method is a qualitative one, total objectivity is difficult to seek because of an absence of quantitative method. Therefore, post-positivism is applied.

3.1.2. Ontological Consideration

Ontological consideration is divided into realists and relativists. Realists believe that there is only one reality (Burrell and Morgan, 2017). Relativists believes in multiple realities. Therefore, realist is related to positivist while relativists is related to constructivists (Burrell and Morgan, 2017).

Applying to the research methodology of critical literature review, realism under positivism is applied since only one reality is being researched based on the research articles found, analyzed and synthesized.

3.1.3. Methodological Consideration

This consideration is divided into quantitative research and qualitative research. Quantitative research is allied with positivism while qualitative research is allied with constructivism (Polit and Beck, 2014).

In quantitative researches, researchers obtain empirical evidence systematically using formal instruments such as questionnaire. The information is usually quantitative--- numerical information. Generalization is sought in researches to generalize the research findings to individuals that do not take part in the research studies (Polit and Beck, 2014).

In qualitative researches, researchers obtain evidence through a more flexible, evolving procedures in a study. The collection of information and its analysis progress concurrently. Researchers usually gain new insight, ask new questions and seek further evidence when they sift through information. Findings are usually rooted from real-life experience of people with first hand information of a phenomenon.

In this research, the consideration of research paradigms is positivist, realist but qualitative research. The reasons for applying positivism, realism is explained above. The reason for applying qualitative researcher is that critical literature review capitalizes on inductive reasoning to generate research findings. Qualitative data is applied to generate qualitative information to describe the findings. Therefore, in this research, a consideration of multiple paradigm is applied. Multiple paradigm consideration is applicable in nursing researchers depending on the ultimate goals and external evidence (Polit and Beck, 2014).

Applying to this research, qualitative research methodology is preferable since it is not always possible to use quantitative analysis to evaluate the results required in the objectives. As stated in the objectives, to (i) investigate the inter-relationship between the dimensions in nurse practice environment, burnout and quality of care and (ii) explore which dimensions in nurse practice environment has greater impact or smaller impact on nurse burnout and quality

of care, qualitative analysis may add more insights and perspectives into the analysis and discussion chapter. Therefore, qualitative research is more preferable.

3.2. Critical Literature Review

Literature review is defined as “the comprehensive study and interpretation of literature that relates to a particular topic.” (Aveyard, 2010, p.5). Another definition of literature review is an “analysis of a segment of a published body of knowledge through summary, classification, and comparison of prior research studies” (Hart, 1998). Literature review is a broad category of methodology that is organized in a continuum, ranging from narrative review to critical literature review or systematic review. Narrative review is ““undefined methods of searching, critiquing and synthesizing the literature” (Aveyard, 2010, p.17). Critical literature review or systematic review is defined as a review that have “explicit rigorous methods of searching, critiquing and synthesizing the literature” (Aveyard, 2010, p.17). In other words, narrative review is on the far-left hand side of a continuum of literature review methodology while critical literature review is on the far-right hand side of a continuum of literature review methodology. The stages and methods of conducting a critical literature review in this research will be described in Section 3.4 “Stages in Conducting Critical Literature Review”.

3.3. The Rationale of Conducting Critical Literature Review

Evidence-based practice is defined as “the use of the best evidence in making patient care decision and such evidence typically comes from research conducted by nurses and other health care professionals.” (Polit and Beck, 2014, p.2). Evidence-based practice is the current trend of improving nurse practice. Before the adoption of evidence-based practice, nurse practice was mainly based on experience and tradition. The emergence of evidence-based practice is rooted from 1970s to polish the practice of nurse because of an increasing questioning of past practice by nursing practitioners (Aveyard, 2010).

The building block of evidence-based practice is a use of multiple systematic literature review or critical literature review to support whether a practice is correct or not (Aveyard, 2010). A practice decision is never made based on

evidence from one research papers. Good evidence-based practice often makes use of thoroughly conducted systematic literature review such as those conducted by Cochrane Collaboration. In systematic literature review conducted by Cochrane Collaboration, multiple research articles are selected, analyzed and synthesized to form a research practice (Aveyard, 2010).

The reason for using multiple studies to form systematic literature review and practice is because one piece of research paper may contradict with another piece of research paper because of different samples or different population or flaws in research method (Aveyard, 2010).

Without this practice, potentially disastrous consequence may occur. For example, a reduction of measles, mumps and rubella vaccinations because of a reliance of a piece of research study by Professor Wakefield and colleagues has led to more incidence of measles and even death (Aveyard, 2010). It shows that reliance on one piece of research evidence to form a practice is potentially disastrous. Therefore, evidence-based practice should strictly apply the principle of using multiple research study to form a practice through systematic literature review.

3.4. Three Stages of Critical Literature Review

There are three stages in the process of critical literature review. They are searching stage, screening stage and analysis stage (Aveyard, 2010).

3.4.1. Searching Stage

This stage is the searching for relevant literatures that are related to the research questions. Although it is not possible to find all available literatures relating to the research questions, it is a goal to strive for (Aveyard, 2010).

This stage involves a search in electronic databases, searching through reference list and the use of Boolean table.

In using electronic databases, a Boolean table must be formed to organize the keywords for searching for literatures. It is a convenient way to search for

literatures. However, it is not possible to use this way to find out all relevant articles. It is a limitation of using electronic database. Therefore, the search of literature is supplemented by other methods also.

[REDACTED]

[REDACTED]

[REDACTED]

hand searching. However, it is time consuming and requires many manpower to conduct. Therefore, it is not recommended. Therefore, even after that, some research articles may still be inevitably left out.

3.4.2. Screening Stage

There are three processes in the screening stage. They are screening by inclusion and exclusion criteria, scanning of abstract and screening by critical appraisal framework.

Inclusion criteria are the criteria for including a research article. Exclusion criteria are criteria of excluding a research article. The use of inclusion and exclusion criteria is only restricted to the title of research articles. The purpose

of this process is to screen out articles that are not in an appropriate time frame, not fitting the research purpose, not using an appropriate language and with duplicated research methodology with the article (Aveyard, 2010), for example, a time range of 2009-2018, English language research and non-literature review research is applied.

Scanning of abstract is to read through the abstract of the research articles found out. Articles that have abstract contents that are not relevant to the research purpose and research questions are screened out (Aveyard, 2010).

Screening by critical appraisal framework is the most important process of screening. It attempts to screen out research articles that are not methodologically sound and have contradictory results due to difference in samples or specific group of people (Aveyard, 2010). It involves reading of the entire research articles and answer the questions posed in a critical appraisal framework selected. Those that are not sound and proper in methodology and with contradictory results are screened out (Aveyard, 2010).

There are many critical appraisal frameworks that are available. One study has identified 121 separate critical appraisal tools (Katrak et al, 2004). Examples are Coughlan et al (2007) framework, Polit et al (2001) framework and the critical appraisal skills programme (CASP) (Critical appraisal skills programme, 2014).

There are two main categories of critical appraisal tools. One type is suitable for specific research design such as randomized controlled trial only. Another type is suitable for a broad category of research design, namely quantitative research and qualitative research. The selection of critical appraisal framework is depended on the depth of the appraisal tools and the knowledge level of the researcher. As an expert of research designs, a tool with more depth should be applied though it may only focus on a broad category of research design. However, as a novice researcher, a simpler appraisal tool that focuses on a specific research design should be applied for simplicity and practicality of application (Aveyard, 2010).

3.4.3. Analysis stage

Analysis stage is about summarization of finding of literature review into a manageable amount (Aveyard, 2010). It concerns combination, analysis and synthesis of researcher findings and breaking down into themes and sub-themes. The first process is meta-summary. It is a simpler derivation of meta-synthesis, meta-ethnography and meta-study. Meta-analysis, meta-ethnography and meta-study are not applied in this study because of its complexity in application (Aveyard, 2010). In this research, the method of meta-summary involves summarization of the content of all research studies by categorizing them into different categories, for example, research aim, findings, strength and limitations, research design and sample, etc.

The second process is to compare the research articles that are summarized in the process of “meta-summary” and divide them into themes and sub-themes (Aveyard, 2010). There are five types of themes that can be developed. They are substantive themes (themes relating to the pattern of evidence and the power of observed effect), methodological themes (themes relating to the difference of results due to difference of research designs), generalizability theme (difference of finding due to different type of people or settings), historical theme (is the evidence getting better through time?) and researcher theme (the difference in results due to the researcher’s characteristics) (Polit and Beck, 2014).

The last process is to map the themes and sub-themes that are identified. Different types of map available for mapping purpose are taxonomy diagram, tree diagram, linear relationship map, etc (Hart, 2018).

3.5 Ethical Considerations

There are many ethical principles in research studies. Principle for research conduct includes beneficence, respect for human dignity and justice (Polit and Beck, 2014). It is important that the research articles that are found out meet such principles for inclusion.

Beneficence is divided into the right to freedom from harm and discomfort and the right to protection from exploitation. The former means a “researcher’s

obligation to prevent or minimize harm in studies with humans” (Polit and Beck, 2014, P.83). Participants are not subject to unnecessary risk of harm or discomfort (Polit and Beck, 2014). The latter means that, in research, participants are entered special relationship of research and the relationship should never be exploited. Exploitation may include overt and malicious one (e.g. sexual exploitation) or subtler one (e.g. given participants a one-year follow-up at the time of interview without warning them that it would happen at the time of interview) (Polit and Beck, 2014).

Respect for human dignity includes the right to self-determination and the right to full disclosure. The right to self-determination means that research participants have the right to decide whether to participate or not without risking any penalty or prejudicial treatment. The latter one means that the researchers have the obligation to fully describe the research, the right to refuse the study and potential risk and benefits. Research participants shall have the right to acknowledge them (Polit and Beck, 2014).

[REDACTED]

[REDACTED]

[REDACTED]

3.6. Conclusion

This chapter is about the methodology of this research. The next chapter is about the specific method of this research.

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4. Method

This chapter is about the specific method applied to conduct this research. As mentioned in the last chapter, critical literature review is divided into three stages, namely, searching stage, screening stage and analysis stage. This chapter is focused on these three stages.

4.1. Searching Stage

It is related to the searching of literatures through means, namely, electronic databases and searching through the reference list.

The search in electronic databases is conducted through both all-in-one databases, namely, EBSCOhost and ProQuest and subject-specific databases, namely, PubMed.

EBSCOhost and ProQuest are all-in-one databases that include many nursing and medical databases, namely, MEDLINE, CINAHL, PsycInfo, PsycArticles, British Nursing Index, etc (ProQuest, 2018; EBSCOhost, 2018). However, not all research articles are included in all-in-one databases. Searching in PubMed is necessary to include the latest research articles (United States National Library of Medicine, 2018).

After selecting the databases, the next step is the construction of Boolean table for searching. One Boolean table is constructed in the critical literature review. Boolean table includes different connectors for connecting different keywords. “And” and “Or” connector is frequently applied.

Table 1 Boolean Table for searching in critical literature review

Nurse practice environment Or Nurse work environment Or Workplace Or Practice environment Or Work environment	And	Burnout	And	Quality-of- care Or Patient outcome Or Outcome
--	-----	---------	-----	--

Another method of searching literatures is a search on reference list. It is necessary to conduct a search on reference list since electronic databases search may not identify all research articles to a research topic. Therefore, it is important to conduct such search since a Boolean table may not identify all keywords of finding research articles (Aveyard, 2010).

However, there is an inherent limitation of not identifying all research articles relating to the research topic. It is because some research articles may be hidden in research journals that are not published on the internet. Hand search might be able to identify them. However, it is time-consuming and requires much manpower. Therefore, it is not suggested to be done.

4.2. Screening Stage

There are three steps in this stage. They are screening through inclusion and exclusion criteria, screening through abstracts and screening through critical appraisal framework.

4.2.1. Inclusion and Exclusion Criteria

Inclusion and exclusion criteria are criteria to include and exclude research articles. It concerns the publication date, language, research design and research topic.

Inclusion criteria include that research articles chosen must be related to the research objectives. Second, the research articles must be within the year 2009 to year 2018. Third, the research article must be in English because the researcher does not have ability in other language.

Exclusion criteria exclude the research articles that are not related to the research objectives, research articles that are not within the time of year 2009 to year 2018, research articles that are in language other than English and research articles that are using the methodology of literature review due to repeating the methodology of this research.

Table 2 The inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
Related to the research objectives	Not related to the research objectives
Within 2009 and 2018	Not within 2009 and 2018
English language	Non-English language articles
	Literature review

4.2.2. Screening Through Abstract

Since the screening of inclusion and exclusion criteria only includes the title, further screening through abstract is required to allow researchers to understand whether the topic is related to the topic through reading the abstract of each research articles (Aveyard, 2010).

4.2.3. Critical Appraisal Framework

Critical appraisal framework is applied to assess whether the research articles has a sound research methodology and results.

There are two categories of critical appraisal framework. The first one is generic appraisal framework such as Coughlan et al (2007) and Polit et al (2001). These frameworks allow researchers to use one framework to appraise all types of

research design in one methodological category, namely, quantitative research and qualitative research. This type of framework requires more understanding of the underlying research methodology since it only divides research methodology into two broad categories, namely, quantitative research and qualitative research. It may not be appropriate for novice researchers to apply this framework to assess complex research articles.

[REDACTED]

4.3. Analysis Stage

This process is related to the analysis of research evidence and dividing the research results into themes and sub-themes. The first process is to use excel software to construct a table to summarize the research findings such as research design, research objectives, samples, research results and research implications. Through looking at the table, the similarities and differences of the research findings can be discovered easily. It allows the researcher to find clues to develop themes and sub-themes for the research. The second process is the mapping of themes and sub-themes through different types of maps such as fishbone diagram for cause-and-effect analysis, mind map and taxonomy diagram for mapping knowledge framework, etc (Aveyard, 2010).

4.4. Chapter Conclusion

This chapter summarizes the method to be applied in this research. The next chapter is about the summary of findings in research articles chosen and a summary critique.

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5. Review

This chapter is divided into two parts. The first part is an overview of the article chosen and a summary of articles chosen. The second part gives a summary critique of all articles. The appendix at the last of this paper gives a detailed critique of all articles chosen.

5.1. An Overview of Articles Chosen

All research articles are either surveys or longitudinal study analyzing secondary data. Although survey is not the highest level in the evidence hierarchy, it is impossible to conduct a randomized controlled trial in this kind of study (Polit and Beck, 2010). It is because it does not involve any interventions and the aim of most researches is to assess a human phenomenon. The human phenomenon being assessed is whether nurse working environment affects burnout and quality.

[REDACTED]

As surveys and longitudinal study are not within the category of studies in CASP, Coughlan et al (2007) for quantitative study is applied.

Figure 1 Electronic database of the literatures retrieved

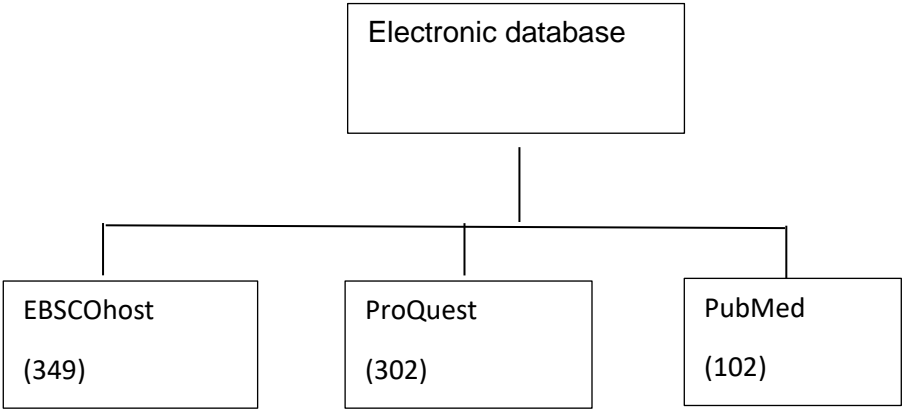


Figure 2 Article Screening

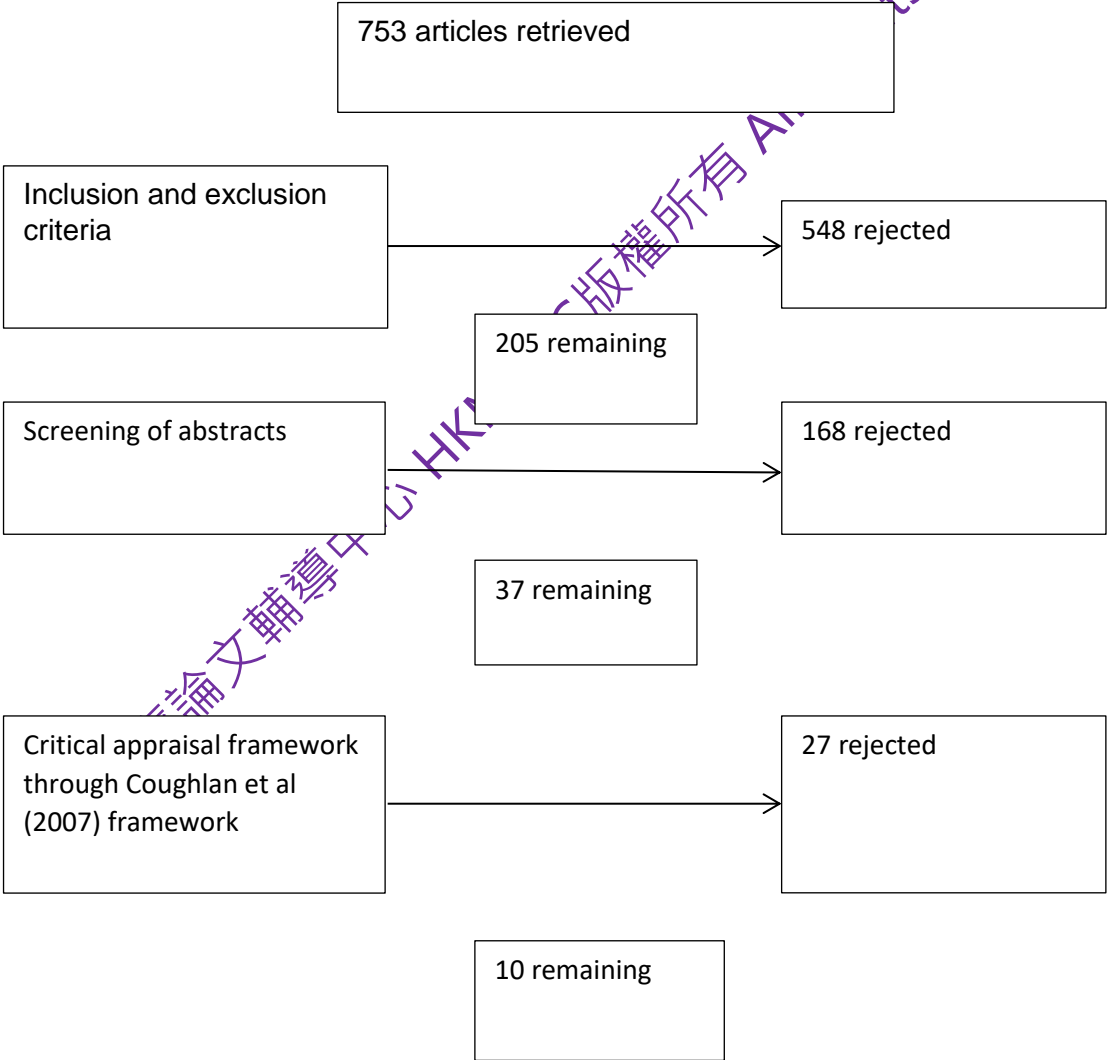


Table 3 List of Articles

1. Van Bogaert, P., Clarke, S., Roelant, E., Meulemans, H., & Van de Heyning, P. (2010). Impacts of unit-level nurse practice environment and burnout on nurse-reported outcomes: a multilevel modelling approach. *Journal of Clinical Nursing*, 19(11-12), 1664-1674.
2. Van Bogaert, P., van Heusden, D., Timmermans, O., & Franck, E. (2014). Nurse work engagement impacts job outcome and nurse-assessed quality of care: model testing with nurse practice environment and nurse work characteristics as predictors. *Frontiers in psychology*, 5, 1261.
3. Stimpfel, A. W., Sloane, D. M., & Aiken, L. H. (2012). The longer the shifts for hospital nurses, the higher the levels of burnout and patient dissatisfaction. *Health affairs*, 31(11), 2501-2509.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
10. Van Bogaert, P., Somers, A., Tegenbos, M., Wouters, K., Van der Straeten, J., Van Aken, P., & Havens, D. S. (2014). The Productive Ward program™: a longitudinal multilevel study of nurse perceived practice environment, burnout, and nurse-reported quality of care and job outcomes. *Journal of Nursing Administration*, 44(9), 452-461.

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Table 4 Summary Grid

Article number	Objectives	Sample	Research design	Results	Practical Implications
1	<p>To explore the mechanisms through which nurse practice environment dimensions are associated with job outcomes and nurse-assessed quality of care.</p>	<p>1,201 registered acute care hospital nurses in eight hospitals across Belgium</p>	<p>Cross-section survey using the Revised Nursing Work Index (NWI-R) (measure work environment), Utrecht Work Engagement Scale (UWES) (measure work engagement), nurse work</p>	<p>Nurse practice environment dimensions predicted nurses' ratings of job outcome variables and quality of care. Features of nurses' work characteristics e.g. perceived workload, decision latitude, social capital and three dimensions of work engaged mediates between nurse practice</p>	<p>Apart from nurse work environment, nurse work characteristics such as workload, decision latitude, social capital and nurse work engagement influence nurse practice environment, job outcome and quality of care.</p>

			characteristics on three measurement scales, workload, decision latitude and social capital and nurse-assessed quality care.	environment, job outcome and quality of care.	
3					There should be policies regulating work hours of nurses. Nurse leaders should encourage workplace cultures that respect nurses; days off and vacation time, promote nurses' prompt departure at the end of shift.

4	To examine the influence of empowering work condition and workplace incivility on nurses' experiences of burnout and important nurse retention factors	612 Canadian staff nurses	Cross-sectional survey measuring structural empowerment by the Conditions for Work Effectiveness Questionnaire (CWEQ), workplace incivility by the Workplace Incivility Scale, burnout by Maslach Burnout Inventory, job satisfaction and organizational commitment and turnover intention.		
5	To study the relationships between nurse practice environment, workload, burnout, job outcomes and nurse-assessed quality of care in psychiatric staff.	357 registered nurses in psychiatric hospitals in Belgium	Cross-sectional survey measuring nurse practice environment by the Revised Nursing Work Index, workload by intensity of labour scale, burnout by Maslach Burnout Inventory and nurse-		

			reported quality of care		
6	To examine the relationship among nurse and work characteristics, job satisfaction, stress, burnout and the work environment of hemodialysis nurses	417 hemodialysis nurses	Cross-sectional online survey measuring nurse and work characteristics, the nurse practice environment, work satisfaction, nurses' stress and burnout	Nurses reported an acceptable level of job satisfaction and positive perception of their work environment although high level of burnout were found. Younger nurses have lower levels of burnout than younger nurses. Greater satisfaction with work environment was strongly correlated with job satisfaction, lower job stress and emotional exhaustion.	There should be strategies to retain and avoid burnout among younger and less experience nurses in highly specialized field of nursing.
7	To determine the conditions under which the impact of hospital nurse staffing, nurse education and work environment are associated with patient outcome	39,308 hospital nurses from 665 hospitals in four large states	Cross-sectional secondary data analysis	The effect of decreasing workloads by one patient/nurse on deaths and failure-to-rescue is virtually nil in hospitals with poor work environments, but decreases the odds on both deaths and failures in hospitals with average environments by 4%, and in hospitals with the best environments by 9 and 10%	While the positive effect of increasing percentages of BSN nurses is consistent across all hospitals, lowering the patient-to-nurse ratios markedly improves patient outcomes in hospitals with good work environments, slightly improves them in hospitals

				respectively. The effect of 10% more BSN nurses decreases the odds on both outcomes in all hospitals, regardless of their work environment, by roughly 4%.	with average environments, and has no effect in hospitals with poor environments.
8	To explore the relationship between Magnet Recognition and nurse-reported quality of care	56 Magnet hospitals and 495 non-magnet hospitals			Magnet hospitals indicate good professional practice environment which is supportive of nursing. It as better nurse-reported quality of care. Hospitals who want to have a better quality of care should take step to follow the criteria to being accredited as magnet hospital.

9			<p>Longitudinal retrospective and concurrent cross-sectional methods measuring nurse work environment, nurse workload, daily ward staffing patient movement profile, adverse events such as number of falls, medication errors.</p>	<p>Higher levels of registered nursing staff were associated with lower levels of adverse events.</p> <p>When workload increased because of increasing patient and when nurses experienced emotional abuse, quality of care reduced.</p>	<p>Nurse/ patient ratio should be improved to reduce nurse workload and reduce adverse event in hospitals.</p>
10			<p>Longitudinal survey measuring nursing work environment, burnout, nurse job satisfaction, nurse-assessed quality of care. The interventions are a series of hospital transformation process to improve nurse work environment and patient safety.</p>	<p>Improvement in nurse-doctor relationship, nurse management, hospital management-organizational support, nurse-reported quality of care and job outcomes were identified.</p>	<p>Hospital strategies and policies should be aligned with daily practices so that engaged and committed staff can promote excellent outcomes.</p>

5.2. Summary Critique

Elements influencing the believability of the research

5.2.1. Writing style

All research articles have a concise writing style, are grammatically correct and avoiding the use of jargon. It is also well laid out and organized (Van Bogaert, 2010; Van Bogaert, 2014a; Stimpfel et al, 2012; Spence Laschinger et al, 2009; Van Bogaert, 2013; Hayes et al, 2015; Aiken et al, 2011; Stimpfel et al (2014), Duffield et al, 2011; Van Bogaert et al, 2014b).

5.2.2. Author

All authors are qualified persons with at least master qualification and, more importantly, holds a decorated position in institutes such as University of Antwerp in Belgium, Academy of Health and Welfare and University of Applied Sciences, in Netherlands and Department of Health Care, Karel de Grote University College in Antwerp, Belgium, University of Pennsylvania in USA and University of Toronto in Canada (Van Bogaert, 2010; Van Bogaert, 2014a; Stimpfel et al, 2012; Spence Laschinger et al, 2009; Van Bogaert, 2013; Hayes et al, 2015; Aiken et al, 2011; Stimpfel et al (2014), Duffield et al, 2011; Van Bogaert et al, 2014b)

5.2.3. Report title

The report titles are between 11 words to about more than 20 words. All clearly identifies the purpose of the study.

5.2.4. Abstract

Apart from Stimpfel et al (2012) and Duffield et al (2011), all abstracts are clearly divided into headings, namely, aim, background, method, results, conclusion and implication to current practice. In Stimpfel et al (2012), the abstract is in one paragraph without any subheadings. Nevertheless, it is quite complete which has descriptions of background, results, conclusion and recommendations. It does not offer aim and research design. The

abstract in Duffield et al (2011) is the most incomplete among the research articles which has only a few sentences summarizing the background and a brief research design without the results and conclusion.

Despite the limitation in the abstract of these studies, it does not affect the rigor of these studies since all research articles did well in the above three criteria of writing style, title and report title.

Elements influencing the robustness of the research

5.2.5. Purpose/ research problem

All research articles provide a clear purpose/research problem ((Van Bogaert, 2010; Van Bogaert, 2014a; Stimpfel et al, 2012; Spence Laschinger et al, 2009; Van Bogaert, 2013; Hayes et al, 2015; Aiken et al, 2011; Stimpfel et al (2014); Duffield et al, 2011; Van Bogaert et al, 2014b). All research articles offer a purpose that they are to explore the relationship between nurse practice environment with outcomes such as burnout and quality of care. Therefore, they are clearly defined, narrow and focused enough to let readers understand.

5.2.6. Logical consistency

Despite some differences in headings among research articles, all research articles followed clear steps of organizing the research articles. The steps of organizing the research articles are more-or-less the same among them. They usually follow the order of introduction, method, results, discussion and conclusion.

5.2.7. Literature review

The literature review of all research articles is located at the beginning of them. First, apart from major tools for measurement of outcomes such as Burnout which stems from the research of Maslach in 1990s (Maslach and Leiter, 1996), all research articles' literature reviews are mainly focused on research articles that are within 10-15 years of publication. Second, the literature reviewed by the authors of research articles are all empirical evidence without any less solid evidence such as those from news reports. However, all

research articles are using casual methodologies of organizing the literature reviews without a systematic strategy of selecting research articles for inclusion.

Third, the literature reviews are all logically organized which describes the background of research studies. Concerning the background, they were mainly previous researches conducted on the same or similar topics. They all supported the purpose of the study and clearly reflected the reasons for conducting this research.

5.2.8. Theoretical framework

All research studies do not offer any theoretical framework. As stated in the research purpose, they are all about exploring the relationship between nurse practice environment

[REDACTED]

Although it is noted that some survey research may apply a theoretical framework and attempt to test a theoretical framework in the study such as theory of planned behavior (Ajzen, 1991), it is non-existent in all research articles in this study.

5.2.9. Aims/ objectives/ research questions/ hypotheses

The aims/objectives/ research questions/hypotheses are clearly stated in the introduction section of all research articles. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout or quality of care or patient satisfaction.

5.2.10. Sample

Apart from Van Bogaert (2013), all research articles have an adequate sample size. Although all research articles do not provide any calculation to justify the adequacy of sample size, the adequacy of sample size is justified by our estimation of population size and calculation of a web site called <https://www.surveysystem.com/sscalc.htm> .

Since all research articles' population are either nurses in a country or hospitals in a country, search for statistics about the number of nurses and hospitals in the respective countries are performed. The sources of information are documented in the appendix for examination.

Second, the population statistics found are inserted in the sample size calculation in <https://www.surveysystem.com/sscalc.htm>

sample size and actual sample size was 25. It was not significant.

All research articles do not have inclusion and exclusion criteria. It is because the samples are mainly nurses or hospitals in a country.

Moreover, most researches except for Aiken et al (2011), Stimpfel et al (2012), Duffield et al (2011) and Stimpfel (2014) applies non-probability sampling. They simply invite nurses to participate in the survey. It reduces the representativeness of the researches. However, since most surveys in the review apply such methods, it may not be a significant exception to the methodology.

5.2.11. Ethical considerations

Apart from Stimpfel et al (2012) and Aiken et al (2011), all research articles declare that they obtained ethical approval from university and hospital's ethical committee. Only Haye et al (2015) show that how ethical principles such as autonomy, non-maleficence, beneficence and justice are applied. The major concerns for a survey research and use of secondary data research is on autonomy. They were well described in Haye et al (2015).

minimized. It is also believed that the confidentiality of research information is maintained because of (i) approval of ethical committee and (ii) the two researches that do not have ethical disclosures are conducted by famous personnel such as Dr. Linda Aiken and are well-quoted. Granted, it is still better to include ethical disclosures in these research articles

5.2.12. Operational definitions

All research articles have their terms, theories and concepts in the study clearly defined.

5.2.13. Methodology

There are two major types of research methodology in these research articles. They are cross-sectional survey and longitudinal secondary data analysis. The major data gathering instruments applied are revised nursing work index and Maslach Burnout Inventory Human Service Survey. The instruments are developed by Aiken and Patrician (2000) and Maslach et al (1996). In some research articles such as Van Bogaert (2014b), Duffield et al (2011), Aiken et al (2011), the reliability and validity of the instruments are discussed in the research articles by quoting the relevant researches of these instruments. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

All data gathering instruments are described in all research articles and the instruments are appropriate.

5.2.14. Data analysis/results

Data and statistical analysis of research articles mainly applied descriptive analysis, regression analysis or structural equation modelling. They are all appropriate in exploring the relationship between different factors (Van Bogaert, 2010; Van Bogaert, 2014a; Stimpfel et al, 2012; Spence Laschinger et al, 2009; Van Bogaert, 2013; Hayes et al, 2015;

Aiken et al, 2011; Stimpfel et al (2014), Duffield et al, 2011; Van Bogaert et al, 2014b). All research articles apply a significance level set at $p < 0.05$. It is appropriate.

5.2.15. Discussion

All findings are linked back to the literature review and the aims. In most research articles, the strength and limitations are discussed. Although only some research articles **discussed the generalizability limitations of the research articles, it is not regarded as a material problem since it is well known that researches are limited in their generalizability in different countries and hospital sectors. The only problem is that there are quite many research articles not offering future research recommendations. It is an issue that makes** it difficult to follow the footsteps of the researchers (Van Bogaert, 2010; Van Bogaert, 2014a; Stimpfel et al, 2012; Spence Laschinger et al, 2009; Van Bogaert, 2013; Hayes et al, 2015; Aiken et al, 2011; Stimpfel et al (2014), Duffield et al, 2011; Van Bogaert et al, 2014b).

5.2.16. Reference

All research articles are accurately referenced.

6. Analysis

This chapter provides an analysis that divides the contents of ten research articles into themes through thematic analysis. The process of thematic analysis and an analysis of themes are provided in this chapter.

6.1. Process of thematic analysis

A maximum of five types of themes is generated from thematic analysis. They are substantive themes, methodological themes, generalizability themes, historical themes and researcher themes. Substantive themes mean themes related to the pattern of evidence and the power of observed effect. Methodological themes mean themes related to the difference of results due to difference of research designs. Generalizability themes mean themes related to difference of findings due to difference type of people or settings. Historical themes mean the themes that related to better evidence over time. Researcher themes mean themes related to differences in results due to researcher's characteristics.

Not all types of themes are applied in a thematic analysis. The most common type of theme is substantive theme and all themes identified is substantive theme. The other four types of themes are not applied because of the following reasons.

- Methodological themes are not applied since all research articles apply similar research methodology, namely, cross-sectional survey and secondary data analysis.



- Researcher theme are not applied since all results generally pointed to a fact that good nurse practice environment leads to less burnout and better quality of care, vice versa. There are no differences of views from different researchers.

There are two steps in producing themes. Since it is not possible for a novice researcher with limited resources and time to produce meta-analysis, meta-ethnography and meta-study. A simple scale of meta-summary is produced.

The first step is to organize a table. The contents of the research articles are organized into categories including the objectives, sample size, research design, results and implications for practice. After organizing them into a table, the results of the study are compared across studies. In the process of comparing the results across studies, patterns can be found through reading the table. The patterns are then organized into themes.

The second step is to map the themes to construct a knowledge framework. A knowledge framework is a simple organization of ideas as expressed in themes. To **organize the knowledge in the thematic analysis, a simple tree diagram is applied. Tree diagram represents the hierarchical nature of structure in a graphical format. In this diagram, lines that branched from the central point are linked to the sub-points. Lines will be drawn between different themes to show the connection between different themes.**

6.2. Themes in this research

After a process in producing themes from the contents of the ten research articles, four themes were identified. The four themes are:

- Research articles generally pointed out that good nurse practice environment lead to reduced burnout and better quality of care, regardless of whether these research articles investigated both burnout and quality of care and whether they use the same terms.

- Long shift hours and higher workload explained a reduction in quality of care measured by patient satisfaction, death, failure-to-rescue ratio and number of adverse events.
- The relationship between nurse practice environment and quality of care may be mediated by factor such as perceived workload, decision latitude, social capital and three dimensions of work engagement, burnout.
- Better workplace empowerment and programmes to improve nurse practice environment leads to job satisfaction, organizational commitment, improvement in nurse-doctor relationship, nurse management, hospital management-organizational support, nurse-reported quality of care.

6.3. The Knowledge Framework in this research

Tree diagram is applied to illustrate the knowledge framework in this research. The following page is the tree diagram.

Figure 1 A Tree Diagram showing the knowledge framework of

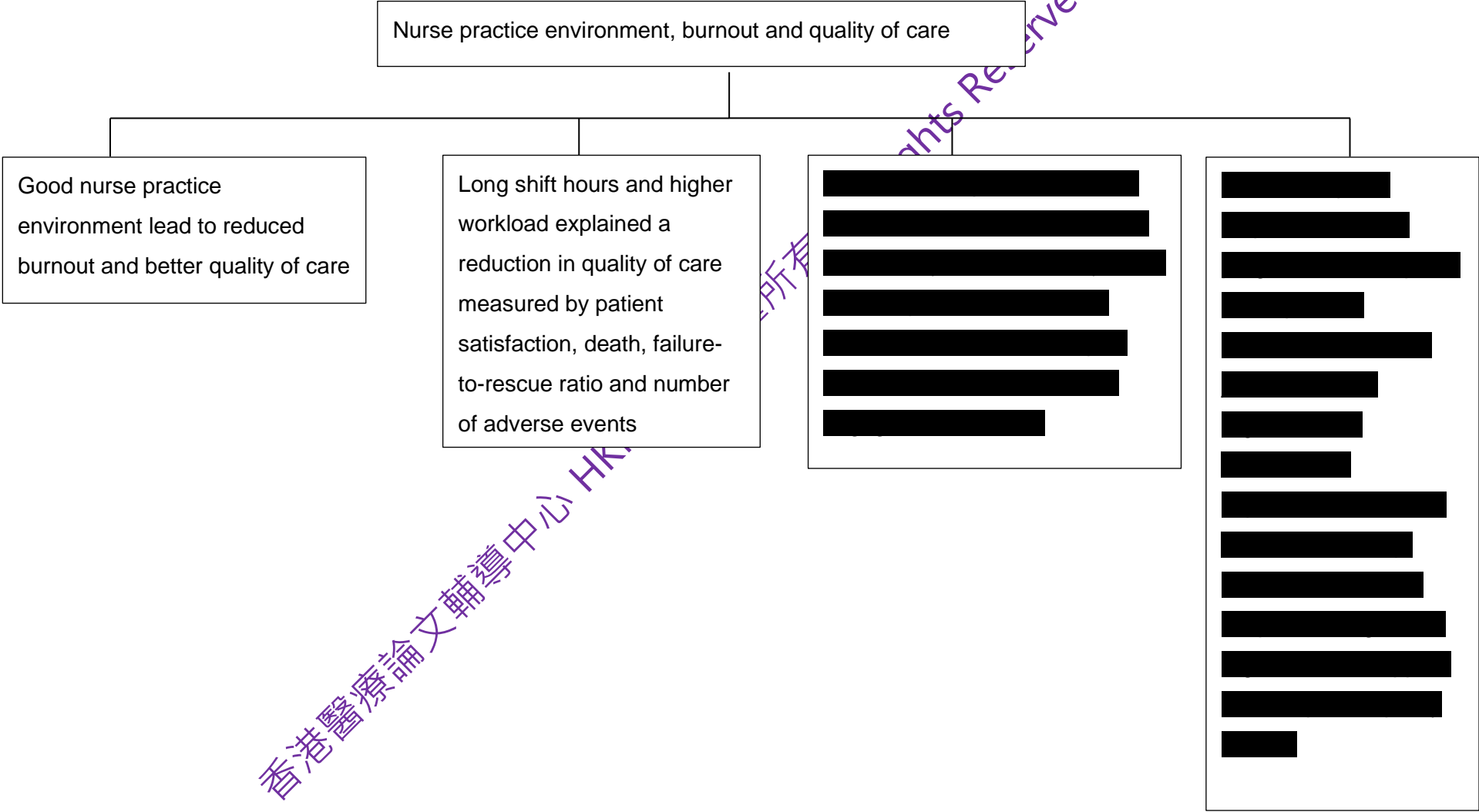


Table 5 Distribution of themes

	Theme 1	Themes 2	Theme 3	Theme 4
Van Bogaert et al (2010)	v			
Van Bogaert et al (2014)	v		v	
	v	v		
	v			v
	v		v	
	v			
	v	v		
	v			v
	v	v		
Van Bogaert et al (2014)	v			v

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6.4. Detailed analysis of the themes

Theme 1:

Research articles generally pointed out that good nurse practice environment lead to reduced burnout and better quality of care, regardless of whether these research articles investigated both burnout and quality of care and whether they use the same terms (Van Bogaert et al, 2010; [REDACTED])

[REDACTED] Aiken et al, 2011; Stimpfel et al, 2014; Duffield et al, 2011; Van Bogaert et al, 2014b)

Van Bogaert et al (2010) found that positive shared ratings of nurse practice environment factors are associated with reduced burnout, improved job outcomes and higher nurse ratings of quality of care. Besides, it was found that higher ratings in burnout, particularly emotional exhaustion, is negatively related to nurse-physician relations, nurse management at the unit level and hospital management and organizational support. In other words, less-superior nurse practice environment leads to higher rating in burnout. Furthermore, among the factors in nurse practice environment, nurse management at the unit level is the most important factor in predicting quality of care on the unit (Van Bogaert et al, 2010). The finding is consistent with the theme that good nurse practice environment lead to reduced burnout and better quality of care.

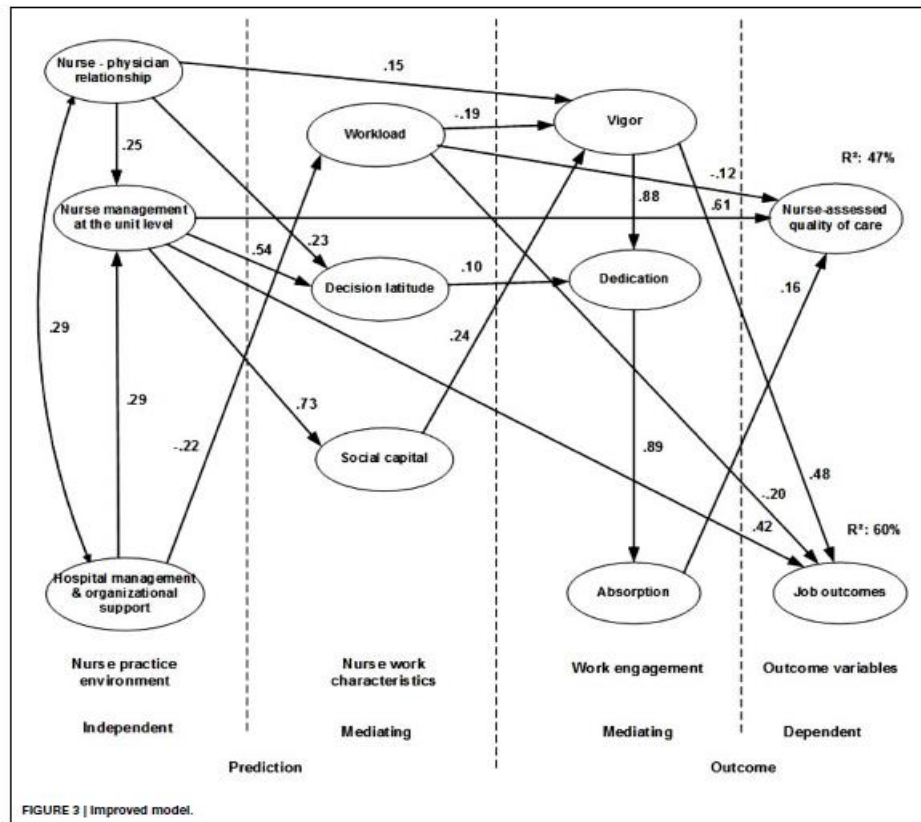
In Van Bogaert et al (2014a), three independent variables of nurse practice environment, namely, nurse-physician relationship, nurse management at the unit level and nurse management and organizational support do not have direct

[REDACTED]

dedication and absorption (Van Bogaert, 2014a). The finding is consistent with the theme that good nurse practice environment is related to better quality of

care. The relationship between different factors is presented in the following figure.

Figure 2 The relationship between nurse practice environment and outcome variables as mediated by nurse work characteristics and work engagement



Ref.: Van Bogaert et al (2014a)

As shown in figure 2, nurse management at the unit level has the largest effect size in its relationship with nurse-assessed quality of care and job outcomes.

Besides, nurse-physician relationship and hospital management and

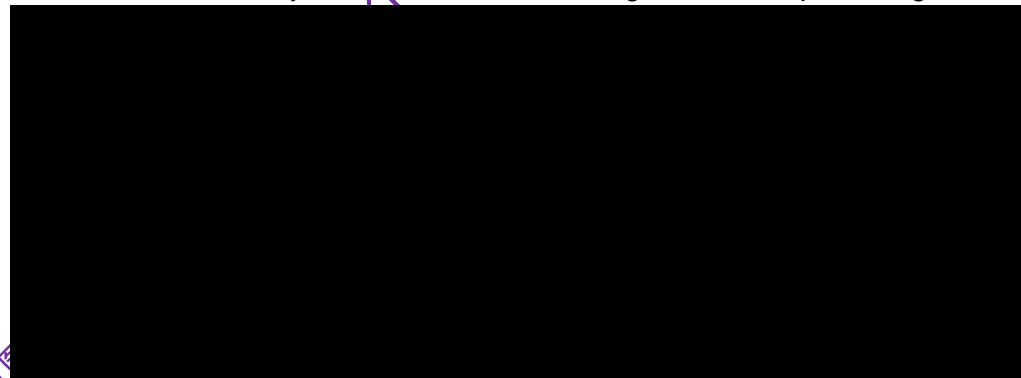
nurse management at the unit level is the most important factor that shape nurse-assessed quality of care and job outcomes. Therefore, in the discussion

chapter, the recommendation is focused on improving nurse management at the unit level.

In Stimpfel et al (2012), it was found that the longer the hours of shifts, the greater the likelihood of adverse nurse outcomes such as burnout. Besides, the longer the hours of shift, the higher the chance for patient dissatisfaction. For instance, patients were less satisfied with their care when there is a higher proportion of nurses working for 13 hours or more than those nurses working for 11 hours or fewer (Stimpfel et al, 2012).

Apart from the factors of nurse practice environment, namely, nurse-physician relationship, nurse management at the unit level and nurse management and organizational support, the number of hours in a shift should also be a factor of nurse practice environment. This study clearly shows that longer working hour lead to more burnout and less desirable quality of care (Stimpfel et al, 2012).

In Spence Laschinger et al (2009), it was found that workplace empowerment, low level of incivility and burnout were significant in predicting nurse

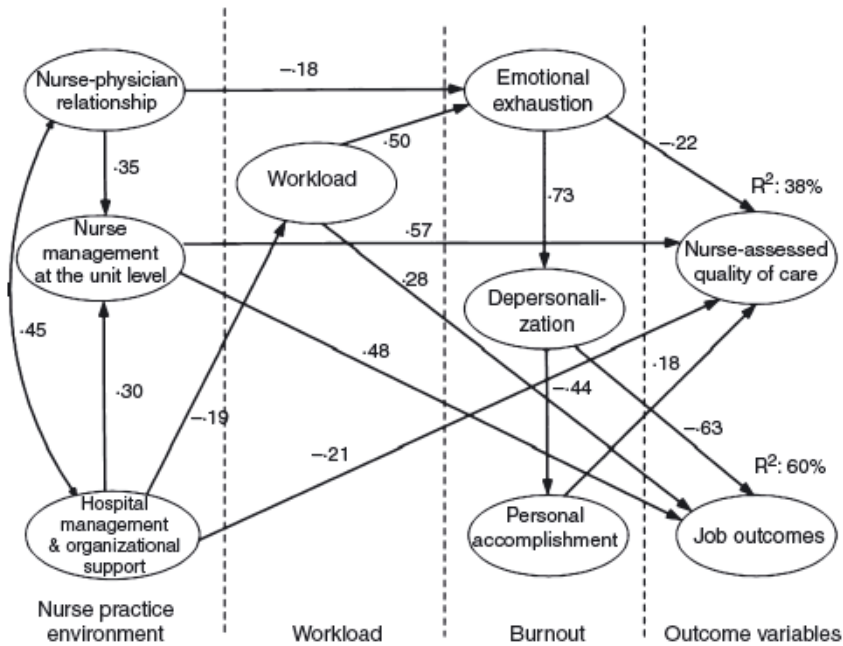


2009). This result points to the fact that better nurse practice environment can reduce burnout and nurse outcome in job satisfaction which is consistent with the theme.

Van Bogaert et al (2013), similar to Van Bogaert et al (2014a), found that nurse management at the unit level is directly related to nurse-assessed quality of care and job outcomes among psychiatric nurses. Besides, nurse-physician relationship and hospital management and organizational support are related

to workload and emotional exhaustion, and emotional exhaustion is related to nurse-assessed quality of care, depersonalization and job dissatisfaction. The below figure shows the interaction of the relationship.


Figure 3 Linkage of research results in Van Bogaert et al (2012)



Ref.: Van Bogaert et al (2012)

Although the interactions of relationship are complicated, it shows that nurse practice environment has impact on nurse-assessed quality of care and burnout no matter it is direct or indirect.

In Hayes et al (2015), it was found that work environment is correlated to job satisfaction and negatively correlated to emotional exhaustion and depersonalization, low job stress. It is consistent with the theme.



Stimpfel et al (2014) found that Magnet recognition is significantly associated with improvement in nurse-reported quality of care. Professional practice environment mediates the relationship between Magnet status and quality of care. This is also consistent with the theme. Magnet recognition is a recognition given by the American Nurses' Credentialing Center (ANCC), to hospitals that is stated to be one where nursing delivers excellent patient outcomes, where nurses have a high level of job satisfaction, and where there is a low staff nurse turnover rate and appropriate grievance resolution.

Duffield et al (2011) found that higher levels of registered nurses (qualified nursing staff) were associated with lower levels of adverse events. Also, it is found that when workload increased because of increasing number of patients and when nurses experienced emotional abuse, quality of care reduced. This latter finding is consistent with the theme.

Van Bogaert et al (2014b) found that The Productive Ward Program which is related to improvement in structural empowerment, transformational leadership and professional practice leads to improvements in nurse-doctor relationship, nurse management and hospital management-organizational support, nurse-reported quality of care and job satisfaction. Although the Productive Ward Program does not improve burnout, it improves the other outcomes especially quality of care.

Overall, it was found that all ten research articles identified improve burnout and/or quality of care. The most common finding is that lower staff workload, better nurse practice environment leads to improved quality of care (Van Bogaert et al, 2014a; Stimpfel et al, 2012; Van Bogaert et al, 2013; Aiken et al, 2011; Stimpfel et al, 2014; Duffield et al, 2011; Van Bogaert et al, 2014b). Another type of finding is that better nurse practice environment leads to lower burnout and improved quality of care (Van Bogaert et al, 2013; Van Bogaert et al, 2010; Spence Laschinger et al, 2009).

Theme 2

Long shift hours and higher workload explained a reduction in quality of care measured by patient satisfaction, death, failure-to-rescue ratio and number of adverse events (Stimpfel et al, 2012; Aiken et al, 2011; Duffield et al, 2011).

Stimpfel et al (2012) found that patient satisfaction decreased when nurses work a longer shift hour of 13 hours or more. Predictably, patient satisfaction increased when nurses work for a shorter shift hour of 11 hours or less. Patient satisfaction increases when the length of shift decreases. Besides, nurses who are working in shifts of ten hours or more were up to two and a half times more likely than nurses working shorter shifts to experience burnout and job dissatisfaction. This result shows that the longer the shift hour, the lesser the patient satisfaction, vice versa.

Aiken et al (2011) found that, in general, the lower the workload of nurses as measured by the greater number of nurses, the lower the inpatient mortality



Duffield et al (2011) found that higher levels of registered nurses (qualified nursing staff) were associated with lower levels of adverse events. Also, it is found that when workload increased because of increasing number of patients and when nurses experienced emotional abuse, quality of care reduced.

Theme 3

The relationship between nurse practice environment and quality of care may be mediated by factor such as perceived workload, decision latitude, social capital and three dimensions of work engagement, burnout (Van Bogaert et al, 2014a; Van Bogaert et al, 2013).

The three components of nurse practice environment are nurse-physician relationship, nurse management at the unit level and hospital management and organizational support. Van Bogaert et al (2014a) found that while there is a direct relationship between nurse management at the unit level and nurse-assessed quality of care, the relationship between the other two components of nurse practice environments and nurse-assessed quality of care are mediated by factors such as workload, decision latitude, social capital, vigor, dedication, absorption. The complicated relationship is presented in figure 2 above. It can be argued that the most important factor that affect nurse-assessed quality of care is nurse management at the unit level. In other words, it is the most important factor that is to be modified.



Theme 4

Better workplace empowerment and programmes to improve nurse practice environment leads to job satisfaction, organizational commitment,

improvement in nurse-doctor relationship, nurse management, hospital management-organizational support, nurse-reported quality of care (Spence Laschinger et al, 2009; Stimpel et al, 2014; Van Bogaert et al, 2014).

Spence Laschinger et al (2009) found that workplace empowerment, lesser workplace incivility and lesser burnout explained significant variance in job satisfaction, organizational commitment and turnover intention. Empowerment, supervisor incivility and cynicism most strongly predicted job dissatisfaction and low commitment while emotional exhaustion, cynicism and supervisor incivility most strongly predicted turnover intentions (Spence Laschinger et al, 2009).



Van Bogaert et al (2014) also found that the productive ward program, a programme that focuses on transformational nursing leadership, structural nurse empowerment and professional practice, is associated with better nurse-physician relationships, nurse management, hospital management-organizational support and nurse-reported quality of care.

6.5. Chapter conclusion

This chapter discusses the relevant themes identified through the analysis of the ten articles chosen. All research articles point out that improvement of nurse practice environment improves quality of care and/or burnout. The next chapter is about a discussion of recommendations on how to improve nurse practice environment.

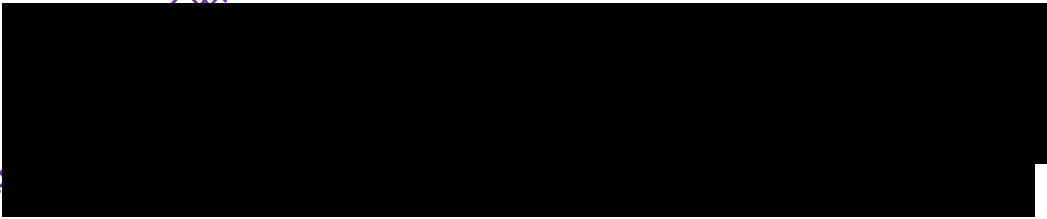
7. Discussion

This chapter mainly tackles the fifth and sixth aim of the dissertation- to provide recommendations in current practice and to discuss the implications for findings in current nursing practice. In the first part of this chapter, there is a recapitulation of the content in chapter 2 Background and chapter 6 analysis. In the second part of this chapter, there are recommendations for current practice and implications for findings in current nursing practice. In the third part of this chapter, there are limitations of this research and the ethical considerations.

7.1. Recapitulation of the Chapter 2 Background and Chapter 6 analysis

In Section 2.4. Correlates of burnout and 2.5. Impact of Burnout, it was found that job characteristics such as high workloads, role ambiguity, role conflict, severity of client's problems and lack of autonomy are positively related to burnout (Schaufeli et al, 2017). Organizational environment such as poor team cohesion and interpersonal conflict at work are positively related to burnout while social support is negatively related to burnout (Schaufeli et al, 2017).

The impacts of burnout are nurse turnover intentions, reduction in quality of care and patient dissatisfaction (Laschinger et al, 2009; Vahey et al, 2004; McHugh et al, 2011; Cimiotti et al, 2012; Leiter and Maslach, 2009; Janssen et al, 1999; Aiken et al, 2002a; Aiken et al, 2002b; Poghosyan et al, 2010; Van Bogaert et al, 2014).



The preliminary findings in Chapter 2 Background are similar to that of the findings in Chapter 6 analysis. In Chapter 6 analysis, it was shown that lower staff workload, better nurse practice environment leads to improved quality of care in another series of articles (Van Bogaert et al, 2014a; Stimpfel et al, 2012; Van Bogaert et al, 2013; Aiken et al, 2011; Stimpfel et al, 2014; Duffield et al, 2011; Van Bogaert et al, 2014b). Besides, better nurse practice environment leads to

lower burnout and improved quality of care in another series of articles (Van Bogaert et al, 2013; Van Bogaert et al, 2010; Spence Laschinger et al, 2009). It is similar to Chapter 2 background's preliminary findings that burnout leads to reduction of quality of care, suboptimal job characteristics lead to burnout and lower quality of care. Furthermore, the findings answer the third research objective of "to investigate the inter-relationship between the dimensions in nurse practice environment, burnout and quality of care".



Also, apart from the relationship between nurse-physician relationship and emotional exhaustion in Van Bogaert et al (2013), there are no direct relationship between other nurse practice environment component and burnout component, for example, the relationship between hospital management-organizational support and emotional exhaustion is mediated by workload. Also, the relationship between emotional exhaustion, depersonalization and personal accomplishment are linked together.

Overall, it was found that poor nurse practice environment directly or indirectly leads to lowered quality of care and/or higher burnout. Nurse management at the unit level is the most important factor among nurse practice environment in influencing quality of care while nurse-physician relationship and hospital management-organizational support may directly or indirectly lead to burnout. In


the next Section, the recommendations for nurse practice to improve nurse practice environment will encompass all the findings.

7.2. Recommendations for Nurse Practice

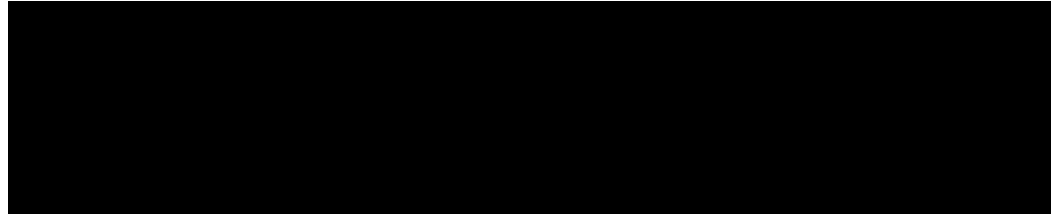
As mentioned in the last section, nurse management at the unit level is the most important factor that affect quality of care. Another two components of nurse practice environment, namely, nurse-physician relations and hospital management and organizational support only have indirect relationship with the three components of burnout (Van Bogaert et al, 2013; Van Bogaert et al, 2014a; Van Bogaert et al, 2010). Noticeably, high workload as measured by higher patient-to-nurse ratio also leads to lower quality of care (Stimpfel et al, 2012; Aiken et al, 2011). Furthermore, recognition such as Magnet status and programmes for improvement of nurse practice environment are important for improvement of quality of care and nurse practice environment (Stimpel et al, 2014; Van Bogaert et al, 2014).

The first recommendation is about how to improve nurse practice environment through actions at nurse management at unit level and guidance of Magnet status.

A good nurse management at the unit level means a nurse management which is clinically competent with clear, up-to-date and standardized philosophy, policies, procedures and nursing care plans and supportive of nurses' judgement and consultation on daily problems and procedures (Aiken and Patrician, 2000; Van Bogaert et al, 2009). As noted in the above explanation, nurse management should ensure that (i) they are clinically competent and keep track of latest knowledge of nurse caring trend, (ii) they are open-minded and supportive of nurses' judgement and allow consultation on



As for reference to other sources, nurse management can establish a good nurse management at unit level with reference to Transformational Model for the Practice of Professional Nursing (Wolf et al, 1994a; Wolf et al, 1994b). The articles describe that a patient-focused care delivering system, the ability for professional



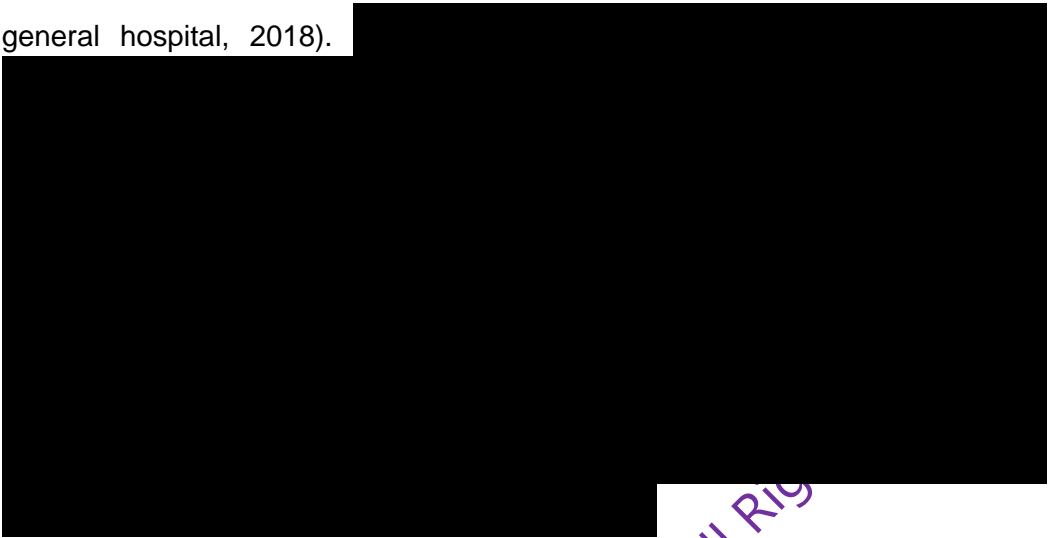
and work flow and use knowledge management practices to establish organizational learning (Page, 2008).

As noted in chapter 6 analysis and the above discussion, a good nurse management at the unit level directly lead to improvement in quality of care and nurse job satisfaction. To a certain extent, it can reduce burnout among nurses (Van Bo Therefore, the above measures should be implemented by nurse management to reduce burnout among nurses and improve quality of care (Van Bogaert et al, 2013; Van Bogaert et al, 2010; Spence Laschinger et al, 2009).

Magnet® hospital recognition is an American Nurse Credentialing Center's highest recognition for hospitals that achieves excellence in nursing practice (American Nurse Association, 2010). It was found that Magnet® hospitals show significantly better work environments than non-magnet hospitals and more highly educated nurse staffing and lower job dissatisfaction than non-magnet hospital (Kelly et al, 2011; Kutney-Lee et al, 2015). One of the articles included in our research also found that Magnet® hospitals has a better professional practice environment that is supportive of nursing and have better nurse-reported quality of care (Stimpfel et al, 2014).

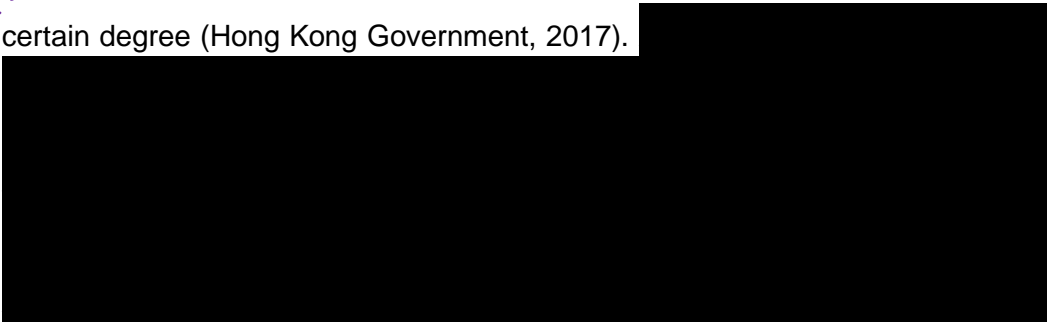
Magnet® recognition is constituted of five components. They are transformational leadership structural empowerment, exemplary professional practice, new knowledge, innovations and improvements and empirical outcome (Massachusetts general hospital, 2018). Examples of transformational leadership are strategic planning, access to leadership, mentoring and succession planning (Massachusetts general hospital, 2018). Examples of structural empowerment

are provision and support of professional development (onboarding, training, continuing education and assessment of learning needs), clinical recognition program, collaborative governance, patient & family teaching, etc (Massachusetts general hospital, 2018).



The criteria of Magnet® hospital recognition is transformational and, if recognized, ensures good nursing outcomes and quality of care. Although Hong Kong hospitals cannot be recognized in the Magnet® programme because they are not American hospitals, it is suggested that Hong Kong hospitals may follow the Magnet® hospital recognition criteria to transform the nursing practice for better nurse practice environment.

The second recommendation is to reduce the workloads of nurse professionals in Hong Kong. Hong Kong has long been suffering from a shortage of nursing professionals. It is projected that by 2030, there will be a shortage of over 1,000 doctors and 1,600 nurses because of aging population (Hong Kong Government, 2017). In recent years, the shortage of doctors and nurses has been standing between 250-340 and 500-800 respectively, signifying a health care problem of certain degree (Hong Kong Government, 2017).



shortage of nurse manpower increases nurse shift hours, a phenomenon of long shift hours may happen or may be happening in Hong Kong.

As mentioned in job demands-resources model (JD-R model) as described in Section 2.4 the process of burnout in Chapter 2, job stress or burnout (exhaustion and depersonalization) develops when job demands are high and job resources are limited. This phenomenon develops regardless of the type of job or occupation (Demerouti et al, 2001). Besides, it is mentioned in section 2.1. Hong Kong Situation of Burnout in Chapter 2, Hong Kong nurses are more likely to suffer



believed to affect both burnout and, to some extent, quality of care in Hong Kong. Improvements are necessary regarding nursing manpower in Hong Kong.

To increase nursing manpower and reduce nurse workloads, all top-level public policies, hospital-level recruitment and training strategies and unit-level procedures and workflows are required. As for public policies, government should increase the resources such as university training facilities, number of nursing student quotas, the amount of compensation of nurse in public hospitals and improvement of nurse working environment to attract, train and retain nurse talents.



7.3. Implication for Nurse Practice

The above recommendations suggest many changes in nurse practice, especially, the first recommendation of nurse management at unit level. Nurse management must understand the principles of change management to implement the changes.

After identifying the needs for changes, change management involves changes that are carefully introduced and managed to be successful, well planned with realistic timelines and expectations and respectful of the people involved. The Lewin's three-stage change model (Lewin, 1947) is a useful tool to understand



The most important restraining forces for changes are people who are denying, resisting, discarding the change. Nurse management must identify change strategies such as normative re-education strategy, power coercive strategy, rational empirical strategy and action centered strategy for changes (Quinn and Sonenshein, 2007).

Applying to the changes in nurse management at unit level which features a creation a supportive nurse environment, standardized work practice and competent nurse management (Aiken and Patrician, 2000; Van Bogaert et al, 2009), conflicts may occur in who can implement and sustaining the changes, the changes of management strategy from top-down to, some extent of bottom-up and the workload of creating a standardized work practice. All four change strategies including power coercive strategy are required to apply for such a change. Nurse management should strictly follow the three changes to implement such a change methodologically.

7.4. Limitations and recommendations for future researches

Apart from Duffield et al (2011) and Van Bogaert et al (2014b), the other eight research articles are cross-sectional studies. In other words, Duffield et al (2011) and Van Bogaert et al (2014b) are longitudinal studies while the other eight articles are cross-sectional studies. Without denying the benefits of cross-sectional studies, longitudinal studies lend additional benefits of tracking the impact of change throughout a longer period. For example, in Stimpfel et al (2014), longitudinal studies can be applied for tracking the performance of Magnet® hospitals and non-magnet hospitals in quality of care and nurse practice environment.

Therefore, in future studies, it may be beneficial to include more longitudinal studies in the literature review for more accurate results over time, especially for new programme that are implemented.

Second, there is no researches based in Hong Kong on this topic. It is important to have Hong Kong statistics to assess whether nurse practice environment have an impact on burnout and quality of care to assess (i) whether the phenomenon applied in western countries applies to Hong Kong (ii) whether there is a need for change in Hong Kong. Without such study, it is unable to assess accurately whether change is necessary in Hong Kong. Otherwise, the researcher can only apply secondary data as presented in Section 2.1 and Section 7.2 to reach a conclusion that it is necessary to deal with burnout and quality of care in Hong Kong.

Therefore, in future empirical studies, researchers in Hong Kong and hospital authority may consider the same topic in this research study.

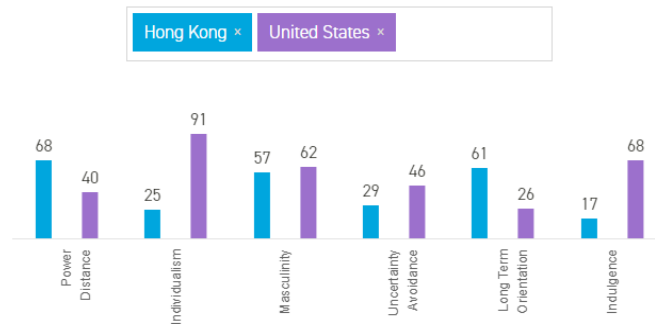
Third, the recommendations presented in Section 7.2 in this chapter may not be totally applicable in Hong Kong because of differences in Eastern and Western cultures. All researches presented in this research are from Western countries such as Belgium and USA. In Section 7.2, it is recommended hospitals should follow Magnet® hospital recognition system and other recommendations to create

a supportive, competent and standardized nursing practice which have elements of transformational leadership, structural empowerment, exemplary professional practice, new knowledge, innovation and improvements and empirical outcomes. However, there are differences in Eastern and Western cultures. The differences between Hong Kong and USA culture through Hofstede cultural study is as follows (Hofstede, 2018):

Figure 4 Cultural differences in Hong Kong and USA

COMPARE COUNTRIES

Please select a country in the dropdown menu below to see the values for the 6 dimensions. After a first country has been selected, a second and even a third country can be chosen to be able to see a comparison of their scores. To compare your personal preferences to the scores of a country of your choice, please purchase our cultural survey tool, the [Culture Compass™](#).



Though similar in masculinity (Hong Kong: 57, USA: 62) and uncertainty avoidance (Hong Kong: 29, USA: 46), there are noticeable differences in individualism/collectivism (Hong Kong: 25 (collectivism society), USA: 91 (individualism society)), power distance (Hong Kong: 68 (High power distance society), USA: 40 (Lower power distance society)), long term orientation and indulgence.

Also, because of collectivism, reform measures might be even more difficult in Hong Kong than in USA because of existence of factionalism (two smaller groups of people in a larger group of people). Though it is not clear how the cultural factors interplay each other in change management, the differences in Eastern and Western culture may affect the process and effectiveness in change

movements. In other words, the same change movement may be highly effective in Western countries but not as effective in Hong Kong. It is suggested that change measure should be implemented in a smaller fraction of an organization before promoting to the entire organization.

7.5. Ethical Implications

There are three major ethical implications. The first one is the avoidance of plagiarism. Plagiarism means directly copying one's work without acknowledging the sources. Researchers should avoid this violation at all costs. Therefore, researcher should acknowledge the sources when using the content of other authors (Polit and Beck, 2014). The second one is objectivity. It means that researcher should not merely select research articles that support his/her own views. They should accept all kinds of view. Even though some research articles may contradict to their own views, researchers should try to reconcile the views apply in these research articles and explain the differences (Polit and Beck, 2014).

The third one concerns with research design in the research articles selected. Research designs should be beneficence, should have respect for human dignity (the right to self-determinism and the right to full disclosure) and have justice. As explained in Section 3.5 Ethical Considerations, researchers should assess the research articles and select research articles that respect such principles (Polit and Beck, 2014).

7.6. Chapter conclusion

This chapter offers a recapitulation of the results reached in Chapter 2 and Chapter 6, recommendations for current nursing practice, limitations of research and ethical considerations. The next chapter is the conclusion of this dissertation.

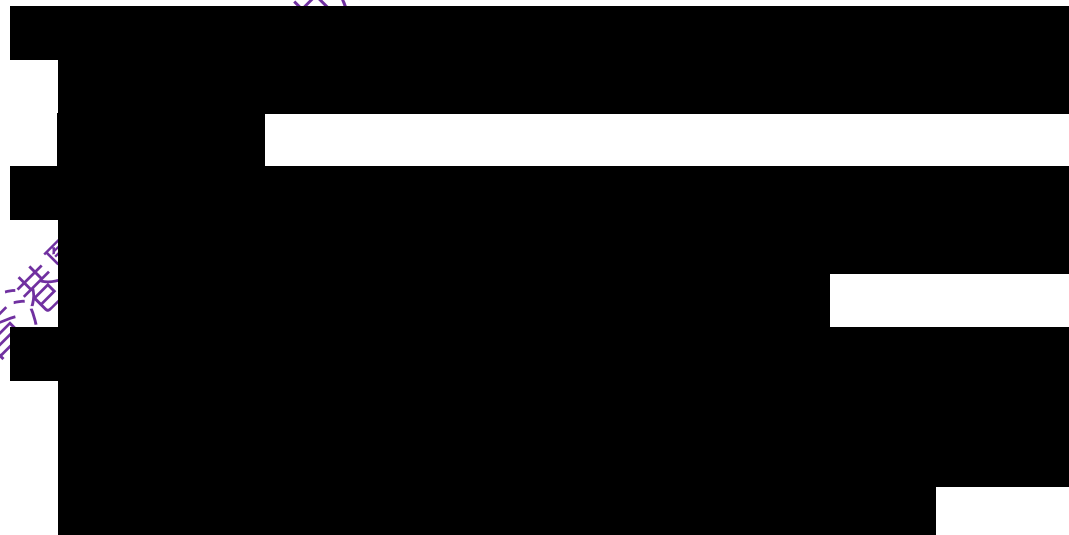
8. Conclusion

This critical literature review is about an investigation on how nurse practice environment affects nurse burnout and quality of care. The major research objectives are to investigate the inter-relationship between the dimensions in nurse practice environment, burnout and quality of care, explore which dimensions in nurse practice environment has greater impact on nurse burnout and quality of care, discuss the implications for the findings in current practice and provide recommendations in current practice.

The methodology in this study is critical literature review. It is a research methodology that makes use of a systematic process in searching, selecting and analyzing research articles to generate themes that summarizes the findings in the ten research articles selected.

After a review of literature and analysis, four themes were identified. They are the followings:

- Research articles generally pointed out that good nurse practice environment lead to reduced burnout and better quality of care, regardless of whether these research articles investigated both burnout and quality of care and whether they use the same terms.



These themes answered the third and fourth research objectives of the dissertation. As for the third research objective as shown in Chapter 1, lower staff workload, better nurse practice environment leads to improved quality of care in one series

of articles (Van Bogaert et al, 2014a; Stimpfel et al, 2012; Van Bogaert et al, 2013; Aiken et al, 2011; Stimpfel et al, 2014; Duffield et al, 2011; Van Bogaert et al, 2014b). Second, better nurse practice environment leads to lower burnout and improved quality of care in another series of articles (Van Bogaert et al, 2013; Van Bogaert et al, 2010; Spence Laschinger et al, 2009).




These findings assist in producing the implications for the findings in current practice. The first implication is that nurse management at unit level is an important focus on improving quality of care and burnout. The second implication is that improvement of nurse practice environment improves quality of care and burnout.

These implications assist in producing the recommendations in current practice. The first recommendation is about how to improve nurse practice environment through actions at nurse management at unit level and guidance of Magnet status. To improve nurse practice environment, nurse management at unit level should be improved by ensuring that (i) they are clinically competent and keep track of latest knowledge of nurse caring trend, (ii) they are open-minded and supportive of nurses' judgement and allow consultation on daily problems and procedures, (ii) they can back up the nursing staff's correct decision-making, even they conflict with a physician, and (iv) they compile written, up-to-date nursing care plans, have a clear philosophy and standardized policies, procedures and ways of doing things.

The improvement of nurse practice environment should also be achieved by the Magnet® hospital recognition criteria of transformational leadership structural empowerment, exemplary professional practice, new knowledge, innovations and improvements and empirical outcome.

The second recommendation is to reduce the workloads of Hong Kong by top-level public policies, hospital-level recruitment and training strategies and unit-level procedures and workflows.



As for implications of nurse practice, it is acknowledged that there are many changes to the nurse practice required to achieve a good nurse practice environment. Nurse management must understand the process and strategies of change management among nurses, for example, Lewin's three stage model and the four strategies of managing changes, namely, normative re-education strategy, power coercive strategy, rational empirical strategy and action centered strategy for changes.

As for limitation of this research, a lack of longitudinal studies, an absence of Hong Kong researches and the difference of Eastern and Western culture in the application of recommendations are the limitations.

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Appendix

Critical appraisal framework applied:

For quantitative research:

Coughlan, M., Cronin, P., & Ryan, F. (2007). Step-by-step guide to critiquing research.

Part 1: quantitative research. British journal of nursing, 16(11), 658-663.

1. Van Bogaert, P., Clarke, S., Roelant, E., Meulemans, H., & Van de Heyning, P. (2010). Impacts of unit-level nurse practice environment and burnout on nurse-reported outcomes: a multilevel modelling approach. Journal of Clinical Nursing, 19(11-12), 1664-1674.

Methodology: Cross-sectional survey research (Quantitative research)

Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All five authors have knowledge in the nursing field. Apart from Peter Van Bogaert, another four authors have PhD qualification and holding a high position in their universities and departments. Peter Van Bogaert, though being a PhD candidate, is the Director of Nursing in Department of Nursing in University Hospital Antwerp. Therefore, all are having the required knowledge and qualification/position for the field.
Report title	The research title has 15 words and clearly identify the purpose of the study.
Abstract	The abstract is complete and offers sections, namely, aim, background, design i.e. research design, method, results, conclusion and relevance to clinical practice which offers similarity to the recommended title of research problem, sample and methodology, findings (for both results and conclusion), recommendations respectively.
Elements influencing the robustness of the research	
Purpose/ research	The purpose of the study is to investigate associations between nurse practice environment and burnout, with job outcomes and

problem	nurse-assessed quality of care in a sample of over 40 Belgian hospital nursing units. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed clear steps of organizing the research article. The sequential order of the research article is from introduction, method, results, discussion and conclusion.
Literature review	The literature review is in the introduction of the research article. The research is published in 2010. The articles within the literature review are of recent origin from 2000 to 2009. They are of primary sources and of empirical nature. The literature review is logically organized which describes the importance of a supportive nurse practice environment, the importance of examining and supporting a good nurse work environment in nursing care. It supports the purpose of the study of investigating between nurse practice environment, burnout with job outcome and quality of care
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/objectives/ research questions/ hypotheses	The aims and objectives of this research is to investigate associations between nurse practice environment and burnout, with job outcomes and nurse-assessed quality of care in a sample of over 40 Belgian hospital nursing units. It is clearly stated in the introduction section. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	The final sample is 546 staff nurses from 42 nursing units. The sample is not selected but by invitation. In other words, staff nurses were invited to voluntarily complete an anonymous questionnaire. Therefore, the sample is a non-probability sample. The sample is adequate. Considering a population of 62,182 of Belgium nurses in

	<div> Confidence Interval: 5 Population: 62182 <input type="button" value="Calculate"/> <input type="button" value="Clear"/> Sample size needed: 382 </div> <p>statistics- _Health2 nple size te. There</p> <p>https://www.surveysystem.com/sscalc.htm</p>
Ethical considerations	<p>Apart from showing that it was approved in advance by ethics committees of relevant hospitals, there are no other ethical considerations shown. Although there are no description of whether participants are fully informed about the nature of the research, the guarantee of autonomy/confidentiality of the participants, protection from harm, it is believed that the risk is not large since survey is a kind of research study with low ethical risk.</p>
Operational definitions	<p>The terms, theories and concepts in the study are clearly defined.</p>
Methodology	<p>The research design is clearly identified as survey. The data gathering instruments such as revised nursing work index and Maslach Burnout Inventory Human Service Survey are clearly described. The instruments are appropriate in measuring nurse practice environment and burnout. The instruments are developed by Aiken and Patrician (2000) and Maslach et al (1996). Although the reliability and validity of the studies are not discussed in the research articles, they were tested for reliability and validity in the original research articles of Aiken and Patrician (2000) and Maslach et al (1996).</p>
Data Analysis/ results	<p>Data and statistical analysis undertaken were descriptive, correlation analysis and regression analysis. They were appropriate in finding the relationship between nurse practice environment, burnout alongside job outcomes and quality of care. The number of samples participated were 546 nurses. The significance level was set at $p < 0.05$ which is appropriate.</p>
Discussion	<p>The findings were linked back to literature review. The literature</p>

	review is about the importance of a supportive nurse practice environment, the importance of examining and supporting a good nurse work environment in nursing care. The strength and limitations of the study were discussed, however, with no generalizability limitation being discussed. There are also no future research recommendations.
Reference	They were accurately referenced.

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2. Van Bogaert, P., van Heusden, D., Timmermans, O., & Franck, E. (2014). Nurse work engagement impacts job outcome and nurse-assessed quality of care: model testing with nurse practice environment and nurse work characteristics as predictors. *Frontiers in psychology*, 5, 1261.

Methodology: Cross-sectional survey research (Quantitative research)

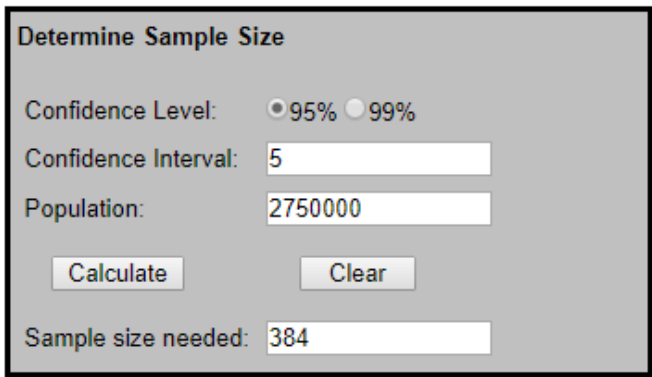
Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All four authors have knowledge in the nursing field. All authors are having a position in University such as University of Antwerp in Belgium, Academy of Health and Welfare and University of Applied Sciences, in Netherlands and Department of Health Care, Karel de Grote University College in Antwerp, Belgium
Report title	The research title has 23 words and clearly identify the purpose of the study.
Abstract	The abstract is complete and offers sections, namely, aim, background, design i.e. research design, method, results, conclusion which offers similarity to the recommended title of research problem, sample and methodology, findings (for results), recommendations (for conclusion section) respectively.
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to explore the mechanisms through which nurse practice environment dimensions such as nurse-physician relationship, nurse management at the unit level and hospital management and organizational support, are associated with job outcomes and nurse-assessed quality of care. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed clear steps of organizing the research article. The sequential order of the research article is from introduction, materials and method, results, discussion and conclusion.
Literature	The literature review is in the introduction of the research article. The

review	research is published in 2014. The articles within the literature review are mainly concentrated recent origin from 2001 to 2013. They are of primary sources and of empirical nature. The literature review is logically-organized which describes the previous researches on the impact of nurse practice environment on burnout and quality of care.
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/ objectives/ research questions/ hypotheses	The aims and objectives of this research is to investigate the relationships between nurse practice environment variables and the outcome variables job outcomes and nurse-assessed quality of care, using structural equation modeling. It is clearly stated in the introduction section. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	<p>The final sample is 1,201 staff nurses. The sample is not selected but by invitation. In other words, staff nurses were invited to voluntarily complete an anonymous questionnaire. Therefore, the sample is adequate.</p> <p>2015 (ref. Health2 sample size te. There</p> <div data-bbox="464 1339 1197 1742" data-label="Form"> <p>Determine Sample Size</p> <p>Confidence Level: <input checked="" type="radio"/> 95% <input type="radio"/> 99%</p> <p>Confidence Interval: <input type="text" value="5"/></p> <p>Population: <input type="text" value="62182"/></p> <p><input type="button" value="Calculate"/> <input type="button" value="Clear"/></p> <p>Sample size needed: <input type="text" value="382"/></p> </div> <p>https://www.surveysystem.com/sscalc.htm</p>
Ethical considerations	Apart from showing that it was approved in advance by ethics committees of relevant hospitals, there are no other ethical considerations shown. Although there is no description of whether

	<p>participants are fully informed about the nature of the research, the guarantee of autonomy/confidentiality of the participants, protection from harm, it is believed that the risk is not large since survey is a kind of research study with low ethical risk.</p>
Operational definitions	<p>The terms, theories and concepts in the study are clearly defined.</p>
Methodology	<p>The research design is clearly identified as survey. The data gathering instruments such as revised nursing work index, Utrecht Work Engagement Scale and Maslach Burnout Inventory Human Service Survey are clearly described. The instruments are appropriate in measuring nurse practice environment and burnout. The instruments are developed by Aiken and Patrician (2000), Schaufeli and Bakker (1994) and Maslach et al (1996). Although the reliability and validity of the studies are not discussed in the research articles, they were tested for reliability and validity in the original research articles of Aiken and Patrician (2000), Schaufeli and Bakker (1994) and Maslach et al (1996).</p>
Data Analysis/ results	<p>Data and statistical analysis undertaken were descriptive, correlation analysis and structural equation modelling. They were appropriate in finding the relationship between nurse practice environment, burnout alongside job outcomes and quality of care. The number of samples participated were 1,201 nurses. The significance level was set at $p < 0.05$ which is appropriate.</p>
Discussion	<p>The findings were linked back to literature review. The literature review is about the previous researches on the impact of nurse practice environment on burnout and quality of care. The strength and limitations of the study were discussed with generalizability limitation being discussed. There are also future research recommendations.</p>
Reference	<p>They were accurately referenced.</p>

Methodology: Secondary data analysis (Quantitative research)

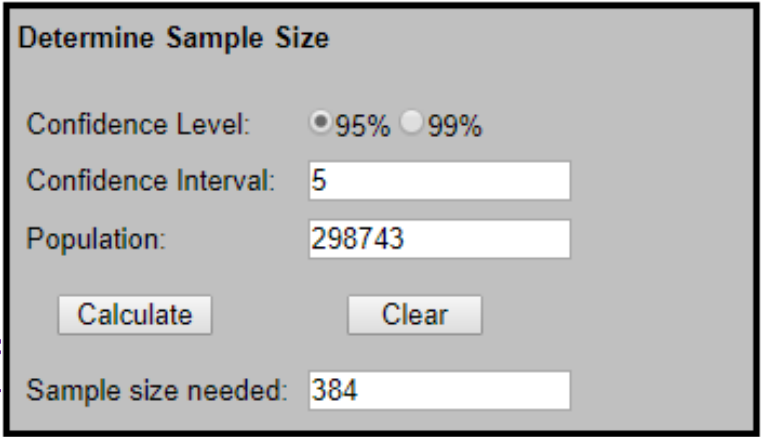
Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All three authors have knowledge in the nursing field. All authors are having a position in University such as University of Pennsylvania, School of Nursing in USA, Clarie M. Fagin Leadership Professor of Nursing, professor of sociology, and director of the Center for Health Outcomes and Policy Research at the University of Pennsylvania School of Nursing.
Report title	The research title has 16 words and clearly identify the purpose of the study.
Abstract	The abstract is complete and has descriptions of background, results, conclusion and recommendations. However, it does not offer aim and research design. Despite that, it does not affect the rigor of the article.
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to explore whether nurse's shift length is associated with patient satisfaction. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed cleat steps of organizing the research article. The sequential order of the research article is from introduction, study data and methods, study results, discussion and implications for policy and practice.
Literature review	The literature review is in the introduction of the research article. The research is published in 2012. The articles within the literature review are mainly concentrated recent origin from 2001 to 2011. They are of primary sources and of empirical nature. The literature review is logically-organized which describes the

	previous researches and background on the hours of shift, burnout and patient satisfaction.
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/objectives/research questions/hypotheses	The aims and objectives of this research is to explore whether nurse's shift length is associated with patient satisfaction. It is clearly stated in the introduction section. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	<p>The sample size is 384. The sample is selected considering a confidence interval of 5% (ref. 2015 (ref. of-registered- sample size of conclusion</p>  <p>https://www.surveysystem.com/sscalc.htm</p>
Ethical considerations	It is not shown whether the research was ethically approved. Although there is no description of whether participants are fully informed about the nature of the research, the guarantee of autonomy/confidentiality of the participants, protection from harm, it is believed that the risk is not large since survey is a kind of research study with low ethical risk.
Operational definitions	The terms, theories and concepts in the study are clearly defined.
Methodology	The research design is clearly identified as a secondary analysis of cross-sectional data from three sources linked by common

	<p>hospital identifiers. The data gathered was shift length, job satisfaction, burnout and patient satisfaction. The instruments are appropriate in measuring nurse practice environment and burnout. The instrument of burnout was Maslach Burnout Inventory. Although the reliability and validity of the studies are not discussed in the research articles, they were tested for reliability and validity in the original research articles of Maslach et al (1996)).</p>
Data Analysis/ results	<p>Data and statistical analysis undertaken were descriptive and least square regression models. They were appropriate in finding the relationship between shift length and patient satisfaction. The number of samples participated were 22,275 nurses. The significance level was set at $p < 0.05$ which is appropriate.</p>
Discussion	<p>The findings were linked back to literature review. The literature review is about the previous research on shift length and burnout. The strength and limitations of the study were discussed with generalizability limitation being discussed. However, there are no future research recommendations.</p>
Reference	<p>They were accurately referenced.</p>

Methodology: Cross-sectional survey research (Quantitative research)

Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All four authors have knowledge in the nursing field. All authors are having a position in University such as University of West Ontario, Acadia University, Saint Mary's University
Report title	The research title has 16 words and clearly identify the purpose of the study.
Abstract	The abstract is complete and has sections of aim, background, method, results, conclusion and implication for nursing management. It gives a complete overview of the content of research article
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to examine the influence of empowering work conditions and workplace incivility on nurses' experience of burnout and important nurse retention factors. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed cleat steps of organizing the research article. The sequential order of the research article is from background, method, results, discussion, limitations and future researches and conclusion.
Literature review	The literature review is in the introduction of the research article. The research is published in 2009. The articles within the literature review are mainly concentrated recent origin from 2001 to 2009. They are of primary sources and of empirical nature. The literature review is logically-organized which describes the major cause of turnover among nurses is related to unsatisfying workplaces. Recently, there have been numerous anecdotal report of uncivil

	behavior in health care settings
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/objectives/research questions/hypotheses	The aims and objectives of this research is to examine the influence of empowering work conditions and workplace incivility on nurses' experience of burnout and important nurse retention factors. It is clearly stated in the introduction section. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	<div>  </div> <p>https://www.surveysystem.com/sscalc.htm</p>
Ethical considerations	It is ethically approved. Although there is no description of whether participants are fully informed about the nature of the research, the guarantee of autonomy/confidentiality of the participants, protection from harm, it is believed that the risk is not large since survey is a kind of research study with low ethical risk.
Operational definitions	The terms, theories and concepts in the study are clearly defined.
Methodology	The research design is clearly identified as a survey. The data

	<p>gathered was shift length, job satisfaction, burnout and patient satisfaction. The instruments are appropriate in measuring conditions for work effectiveness questionnaire-II (Chandler, 1986), Workplace Incivility Scale (Cortina et al, 2001), Maslach Burnout Inventory- General Survey (Schaufeli et al, 1996), job satisfaction (Hackman and Oldham, 1975), affective commitment scale (Meyer et al, 1993) and turnover intentions (Kelloway et al, 1999). Although the reliability and validity of the studies are discussed in the research articles, they were tested for reliability and validity in the original research articles of Chandler (1986), Cortina et al (2001), Schaufeli et al (1996), Hackman and Oldham (1975), Meyer et al (1993) and Kelloway et al (1999).</p>
Data Analysis/ results	<p>Data and statistical analysis undertaken were descriptive and inferential statistical analysis. They were appropriate in examining the influence of empowering work conditions and workplace incivility on nurses' experience of burnout and important nurse retention factors. The number of samples participated were 612 nurses. The significance level was set at $p < 0.05$ which is appropriate.</p>
Discussion	<p>The findings were linked back to literature review. The literature review is about the previous research on this topic. The strength and limitations of the study were discussed with generalizability limitation being discussed. However, there are also future research recommendations.</p>
Reference	<p>They were accurately referenced.</p>

Methodology: Cross-sectional survey research (Quantitative research)

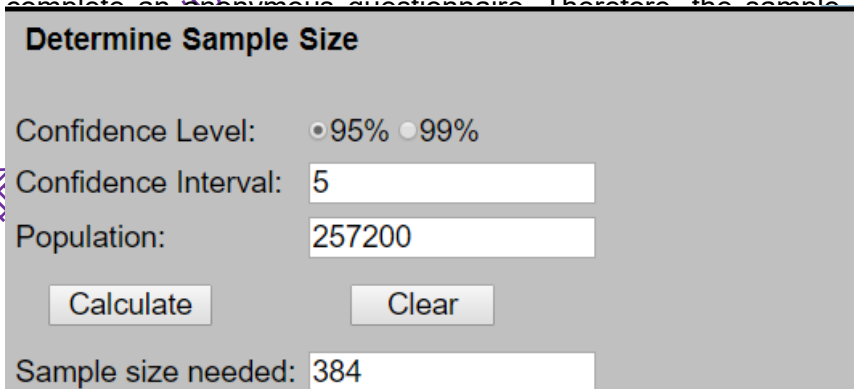
Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All four authors have knowledge in the nursing field. All authors are having a position in University such as University of Antwerp in Belgium, University of Toronto, Public Psychiatric Hospital Geel.
Report title	The research title has 19 words and clearly identify the purpose of the study.
Abstract	The abstract is complete and offers sections, namely, aim, background, design i.e. research design, method, results, conclusion which offers similarity to the recommended title of research problem, sample and methodology, findings (for results), recommendations (for conclusion section) respectively.
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to study the relationship between nurse practice environment, workload, burnout, job outcomes and nurse-reported quality of care in psychiatric hospital staff. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed clear steps of organizing the research article. The sequential order of the research article is from introduction, the study, results, discussion, study limitations and conclusion.
Literature review	The literature review is in the introduction and background of the research article. The research is published in 2012. The articles within the literature review are mainly concentrated recent origin from 2001 to 2011. They are of primary sources and of empirical nature. The literature review is logically-organized which describes the

	background of studying nurses' practice environments in general hospitals and point out that variation across practice settings such as in psychiatric hospitals were less studied.
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/objectives/research questions/hypotheses	The aims and objectives of this research is to study the relationship between nurse practice environment, workload, burnout, job outcomes and nurse-reported quality of care in psychiatric hospital staff. It is clearly stated in the introduction section. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	<p>The final sample is 357 staff nurses. The sample is not selected but by invitation. In other words, staff nurses were invited to voluntarily complete an anonymous questionnaire. Therefore, the sample is a</p> <div data-bbox="464 1180 1197 1583" data-label="Form"> <p>Determine Sample Size</p> <p>Confidence Level: <input checked="" type="radio"/> 95% <input type="radio"/> 99%</p> <p>Confidence Interval: <input type="text" value="5"/></p> <p>Population: <input type="text" value="62182"/></p> <p><input type="button" value="Calculate"/> <input type="button" value="Clear"/></p> <p>Sample size needed: <input type="text" value="382"/></p> </div> <p>adequate. 2015 (ref. _Health2 nple size ghtly not</p> <p>https://www.surveysystem.com/sscalc.htm</p>
Ethical considerations	Apart from showing that it was approved in advance by ethics committees of relevant hospitals, there are no other ethical considerations shown. Although there is no description of whether participants are fully informed about the nature of the research, the guarantee of autonomy/confidentiality of the participants, protection from harm, it is believed that the risk is not large since survey is a

	kind of research study with low ethical risk.
Operational definitions	The terms, theories and concepts in the study are clearly defined.
Methodology	The research design is clearly identified as survey. The data gathering instruments such as revised nursing work index, an intensity of labor scale, Maslach burnout inventory human service survey. The instruments are developed by Aiken and Patrician (2000), Richter et al (2000) and Vlerick (1996). The reliability and validity of the studies are discussed in the research articles.
Data Analysis/ results	Data and statistical analysis undertaken were structural equation model. They were appropriate in finding the relationship between nurse practice environment, workload, burnout, job outcomes and nurse-reported quality of care in psychiatric hospital staff. The number of samples participated were 357 nurses. The significance level was set at $p < 0.05$ which is appropriate.
Discussion	The findings were linked back to literature review. The literature review is about the previous researches on the impact of nurse practice environment on burnout and quality of care. The strength and limitations of the study were discussed with generalizability limitation being discussed. There are also future research recommendations.
Reference	They were accurately referenced.

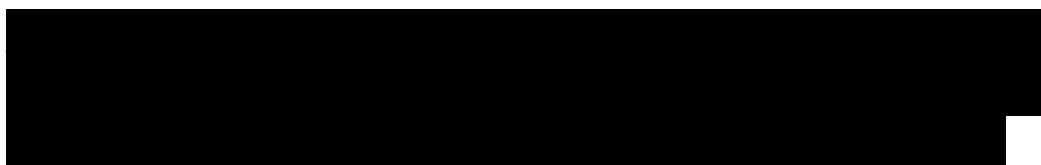
Methodology: Cross-sectional survey research (Quantitative research)

Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All three authors have knowledge in the nursing field. All authors are having a position in University such as Queensland University of Technology and Royal Brisbane and Women's Hospital, Queensland, Australia.
Report title	The research title has 10 words and clearly identify the purpose of the study.
Abstract	The abstract is complete and offers sections, namely, aim, background, method, results, conclusion and implications for nursing management which offers similarity to the recommended title of research problem, sample and methodology, findings (for results), recommendations (for conclusion section) respectively.
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to examine the relationships among nurse and work characteristics, job satisfaction, stress, burnout and the work environment of haemodialysis nurses. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed clear steps of organizing the research article. The sequential order of the research article is from introduction, overview of the literature, method, results, discussion, limitations and implications for nursing management.
Literature review	The literature review is in the introduction and background of the research article. The research is published in 2015. The articles within the literature review are mainly concentrated recent origin from 2001 to 2014. They are of primary sources and of empirical nature. The literature review is logically-organized which describes the

	background of haemodialysis nursing is characterized by frequent and intense contact with patients in a complex and intense environment. It provides the needs for investigating whether there are relationships between work environment, job satisfaction, stress and burnout among these nurses.
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/objectives/research questions/hypotheses	The aims and objectives of this research is to examine the relationships among nurse and work characteristics, job satisfaction, stress, burnout and the work environment of haemodialysis nurses. It is clearly stated in the introduction section. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	<p>The final sample is 417 staff nurses. The sample is not selected but by invitation. In other words, staff nurses were invited to voluntarily complete an anonymous questionnaire. Therefore, the sample is a</p>  <p>https://www.surveysystem.com/sscalc.htm</p>
Ethical considerations	Apart from showing that it was approved in advance by the University's human research ethical committee. Further descriptions are provided that, at the start of the survey, detailed information about the study was provided and participants were informed that completion of the survey implied consent. It also provided anonymity since online survey

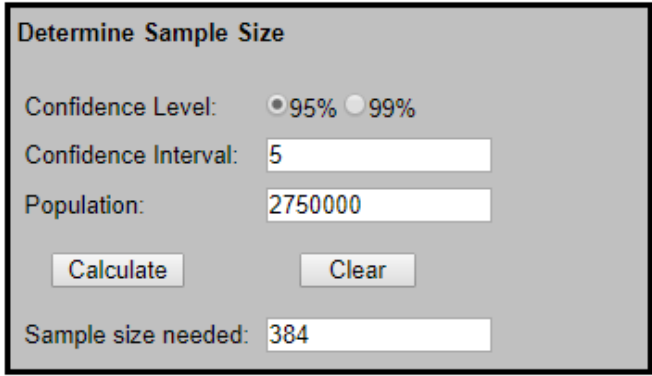
	are provided.
Operational definitions	The terms, theories and concepts in the study are clearly defined.
Methodology	The research design is clearly identified as survey. The data gathering instruments such as Brisbane Practice Environment Scale, index for work satisfaction, nursing stress scale and Maslach Burnout Inventory. The instruments are developed by Flint et al (2010), Stamps (1997), Gray-Toft and Anderson (1981) and Maslach and Jackson (1981). The reliability and validity of the studies are discussed in the research articles.
Data Analysis/ results	Data and statistical analysis undertaken were descriptive statistical analysis, ANOVAS and independent t-test, correlation analysis. They were appropriate in finding the relationship between nurse practice environment, workload, burnout, job outcomes and nurse-reported quality of care in psychiatric hospital staff. The number of samples participated were 417 nurses. The significance level was set at $p < 0.05$ which is appropriate.
Discussion	The findings were linked back to literature review. The literature review is about the previous researches on the impact of nurse practice environment on burnout and quality of care. The strength and limitations of the study were discussed with generalizability limitation being discussed. There are also future research recommendations.
Reference	They were accurately referenced.

7.



Methodology: Secondary data analysis (Quantitative research)

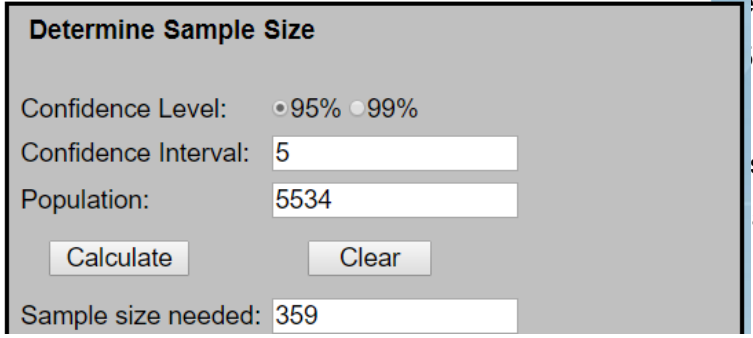
Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All six authors have knowledge in the nursing field. All authors are having a position in University such as University of Pennsylvania, The State University of New Jersey and University of Florida.
Report title	The research title has 18 words and clearly identify the purpose of the study.
Abstract	The abstract is complete and offers sections, namely, context, objective, design, settings and participants, main outcome measures, results and conclusion which offers similarity to the recommended title of research problem, sample and methodology, findings (for results), recommendations (for conclusion section) respectively.
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to determine the conditions under which the impact of hospital nurse staffing, nurse education and work environment are associated with patient outcomes. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed clear steps of organizing the research article. The sequential order of the research article is from introduction, method, results, discussion and conclusion.
Literature review	The literature review is in the introduction and background of the research article. The research is published in 2011. The articles within the literature review are mainly concentrated recent origin from 2002 to 2011. They are of primary sources and of empirical nature. The literature review is logically-organized which

	describes that better hospital nurse staffing, more educated nurses, and improved nurse work environments have been shown to be associated with lower hospital mortality. However, little is known about whether and under what conditions each type of investment works better to improve outcomes.
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/ objectives/ research questions/ hypotheses	The aims and objectives of this research is to determine the conditions under which the impact of hospital nurse staffing, nurse education and work environment are associated with patient outcomes. It is clearly stated in the introduction section. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	<p>The sample size is 384. The sample is selected considering a confidence interval of 5% (ref. Polit and Beck, 2015) (ref. https://www.surveysystem.com/sscalc.htm).</p>  <p>https://www.surveysystem.com/sscalc.htm</p>
Ethical considerations	There are no ethical considerations described.
Operational definitions	The terms, theories and concepts in the study are clearly defined.

Methodology	The research design is clearly identified as secondary data analysis. The main outcome measured are 30-day inpatient mortality and failure-to-rescue. The reliability and validity of the studies are discussed in the research articles.
Data Analysis/ results	Data and statistical analysis undertaken was logistic regression analysis. They were appropriate in finding the relationship between conditions under which the impact of hospital nurse staffing, nurse education and work environment are associated with patient outcomes. The number of samples participated were 39,038 nurses. The significance level was set at $p < 0.05$ which is appropriate.
Discussion	The findings were linked back to literature review. The literature review is logically-organized which describes that better hospital nurse staffing, more educated nurses, and improved nurse work environments have been shown to be associated with lower hospital mortality. However, little is known about whether and under what conditions each type of investment works better to improve outcomes. The strength and limitations of the study were discussed with generalizability limitation being discussed. However, there are no future research recommendations.
Reference	They were accurately referenced.

Methodology: Secondary data analysis (Quantitative research)

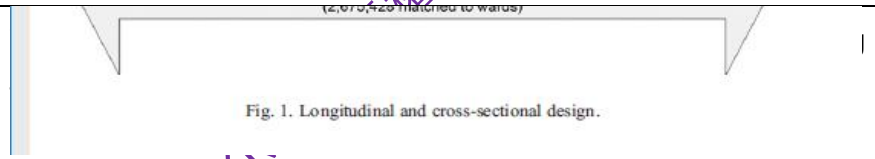
Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All three authors have knowledge in the nursing field. All authors are having a position in University such as New York University and University of Pennsylvania
Report title	The research title has 17 words and clearly identify the purpose of the study.
Abstract	The abstract is complete and offers sections, namely, objective, background, method, results and conclusion which offers similarity to the recommended title of research problem, sample and methodology, findings (for results), recommendations (for conclusion section) respectively.
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to explore the relationship between Magnet Recognition and nurse-reported quality of care. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed clear steps of organizing the research article. The sequential order of the research article is from introduction, method, results, discussion, limitation and conclusion.
Literature review	The literature review is in the introduction and background of the research article. The research is published in 2014. The articles within the literature review are mainly concentrated recent origin from 2002 to 2014. They are of primary sources and of empirical nature. The literature review is logically-organized which describes that Magnet hospitals are recognized for nursing excellence and quality patient outcomes. However, few studies

	have explored contributing factors for these superior outcomes.
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/objectives/research questions/hypotheses	The aims and objectives of this research is to explore the relationship between Magnet Recognition and nurse-reported quality of care. It is clearly stated in the introduction section. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	<p>The final sample is 551 hospitals included 56 Magnet hospitals and 495 non-magnet hospitals. The sample is selected with</p>  <p>https://www.surveysystem.com/sscalc.htm</p>
Ethical considerations	There are no ethical considerations described.
Operational definitions	The terms, theories and concepts in the study are clearly defined.
Methodology	The research design is clearly identified as secondary data analysis. The main outcome measured are quality of care, practice environment scale of nursing work index, hospital structural characteristics. The reliability and validity of the studies

	are not discussed in the research articles, but they are tools that are tested in other research articles.
Data Analysis/ results	Data and statistical analysis undertaken was least square regression models. They were appropriate in finding the relationship between Magnet Recognition and nurse-reported quality of care. The number of samples participated were 551 hospitals included 56 Magnet hospitals and 495 non-magnet hospitals. The significance level was set at $p < 0.05$ which is appropriate.
Discussion	The findings were linked back to literature review. The literature review is logically-organized which describes that Magnet hospitals are recognized for nursing excellence and quality patient outcomes. However, few studies have explored contributing factors for these superior outcomes. The strength and limitations of the study were discussed with generalizability limitation being discussed. However, there are no future research recommendations.
Reference	They were accurately referenced.

Methodology: Secondary data analysis (Quantitative research)

Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All three authors have knowledge in the nursing field. All authors are having a position in University such as University of Technology in Australia, Yale University School of Nursing, University of Toronto, University of Sydney
Report title	The research title has 10 words and clearly identify the purpose of the study.
Abstract	The abstract is not complete with only a few sentences and no sections divided.
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to examine whether nursing workload (measured as inpatient acuity, shorter LOS, patient turnover, and casemix) and skill mix increased over time and examine whether there are relationship among patient outcomes (OPSN, falls, and medication errors, nurse skills mix, nursing workload and the nursing work environment. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed clear steps of organizing the research article. The sequential order of the research article is from introduction, method, results, discussion, limitation and conclusion.
Literature review	The literature review is in the introduction and background of the research article. The research is published in 2011. The articles within the literature review are mainly concentrated recent origin from 2002 to 2011. They are of primary sources and of empirical nature. The literature review is logically-organized which describes the relationship between nurse staffing and patient outcomes, nursing workload, working environment and patient outcomes

Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/objectives/research questions/hypotheses	The aims and objectives of this research is to to examine whether nursing workload (measured as inpatient acuity, shorter LOS, patient turnover, and casemix) and skill mix increased over time and examine whether there are relationship among patient outcomes (OPSN, falls, and medication errors, nurse skills mix, nursing workload and the nursing work environment. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	 <p>Fig. 1. Longitudinal and cross-sectional design.</p>
Ethical considerations	The study was approved by the Human Research Ethics Committee of the University of Technology, Sydney and 14 other ethics committee at NSW Health and AHS.
Operational definitions	The terms, theories and concepts in the study are clearly defined.
Methodology	The research design is clearly identified as Nursing work index, nursing survey on their perception about the work environment and quality of care on the unit, ECS, Workload measure. The reliability and validity of the studies are discussed in the research articles
Data Analysis/results	Data and statistical analysis undertaken was regression models. They were appropriate in finding the relationship examine whether nursing workload (measured as inpatient acuity, shorter LOS, patient turnover, and casemix) and skill mix increased over time and examine whether there are relationship among patient

	outcomes (OPSN, falls, and medication errors, nurse skills mix, nursing workload and the nursing work environment. The significance level was set at $p < 0.05$ which is appropriate.
Discussion	The findings were linked back to literature review. The literature review is logically-organized which describes which describes the relationship between nurse staffing and patient outcomes, nursing workload, working environment and patient outcomes. The strength and limitations of the study were discussed with no generalizability limitation being discussed. There are also no future research recommendations.
Reference	They were accurately referenced.

Methodology: Secondary data analysis (Quantitative research)

Elements influencing the believability of the research	
Writing style	The writing style is concise, grammatically correct and avoiding the use of jargon. It is also well laid out and organized.
Author	All eight authors have knowledge in the nursing field. All authors are having a position in University such as University of Antwerp, Antwerp University Hospital, School of Nursing.
Report title	The research title has 18 words and clearly identify the purpose of the study.
Abstract	The abstract is not complete with only a few sentences and no sections divided.
Elements influencing the robustness of the research	
Purpose/ research problem	The purpose of the study is to investigate the impact of the Productive Ward-Releasing Time to Care program implemented in a hospital transformation process on nurse perception related to practice environment, burnout, quality of care and job outcomes. As written in the research articles, the purpose is narrow and focused enough to let readers understand.
Logical consistency	The research articles followed clear steps of organizing the research article. The sequential order of the research article is from introduction, method, results, discussion, limitation and conclusion.
Literature review	The literature review is in the introduction and background of the research article. The research is published in 2011. The articles within the literature review are mainly concentrated recent origin from 2000 to 2014. They are of primary sources and of empirical nature. The literature review is logically-organized which describes the continuously evolving complex challenges of

	patient care, high-performance nursing care is necessary.
Theoretical framework	The study does not have a theoretical framework. It only offered to test the possible association between the factors as described in the research purpose. As referred to Burns and Grove (1999), theoretical frameworks tend to be better developed in experimental and quasi-experimental studies and often poorly developed or non-existent in descriptive studies. Since survey is a type of descriptive studies (Polit and Beck, 2014), it is acceptable.
Aims/ objectives/ research questions/ hypotheses	The aims and objectives of this research is to investigate the impact of the Productive Ward-Releasing Time to Care program implemented in a hospital transformation process on nurse perception related to practice environment, burnout, quality of care and job outcomes. It also reflects the information presented in the literature review since the literature review mentioned nurse practice environment and burnout.
Sample	The samples are adequate.
Ethical considerations	The study was approved by the ethic review committee.
Operational definitions	The terms, theories and concepts in the study are clearly defined.
Methodology	The research design is clearly identified as Nursing work index, Maslach Burnout Inventory- Human Services Survey, nurse-reported job outcomes, nurse-reported quality of care. The reliability and validity of the studies are discussed in the research articles
Data Analysis/ results	Data and statistical analysis undertaken was descriptive statistics, regression analysis. They were appropriate in investigating the impact of the Productive Ward-Releasing Time to Care program implemented in a hospital transformation process on nurse perception related to practice environment, burnout, quality of care and job outcomes. The significance level

	was set at $p < 0.05$ which is appropriate.
Discussion	The findings were linked back to literature review. The literature review is logically-organized which describes which describes the relationship between nurse practice environment, burnout, quality of care and job outcomes. The strength and limitations of the study were discussed with generalizability limitation being discussed. There are also no future research recommendations.
Reference	They were accurately referenced.

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