



NURSE FATIGUE AND PATIENT SAFETY

Research Report

All rights reserved. No part of this document may be reproduced, stored in a retrieval system, or transcribed, in any form or by any means, electronic, mechanical, photocopying, recording, posted on any web, ftp or similar site, or otherwise, without written permission of the publisher.

© **Canadian Nurses Association**
50 Driveway
Ottawa, ON K2P 1E2
Tel.: 613-237-2133 or 1-800-361-8404
Fax: 613-237-3520
Website: www.cna-aic.ca

May 2010
ISBN 978-1-55119-323-6

This report was produced by CNA and RNAO to provide information on a particular topic or topics. The views and opinions expressed in this report do not necessarily reflect the views of the CNA or the RNAO board of directors.

Executive Summary	1
Introduction	5
Background	6
Project Methodology	7
National Advisory Committee.....	7
Results	9
Key Informant Interviews and Focus Groups.....	9
Literature Review.....	11
Contributing Factors to Fatigue: Literature Review.....	12
Consequences of Fatigue: Literature Review.....	13
Solutions to Mitigate and Manage Fatigue in Nursing: Literature Review.....	14
National Nurses' Survey.....	16
Demographics.....	16
Contributing Factors to Fatigue: Nurses' Survey.....	19
Consequences of Fatigue: Nurses' Survey.....	22
Factors Assisting and Preventing Response to Fatigue.....	22
Solutions to Mitigate and Manage Fatigue: Long Survey.....	25
National Organizational Survey.....	29
Recommended Solutions	30
System-Level Recommendations.....	30
Organizational-Level Recommendations.....	31
Individual-Level Recommendations.....	32
Conclusion	33
References	34
Appendix A: National Advisory Committee	39
Appendix B: Conceptual Model for Healthy Work Environments for Nurses	40
Appendix C: Scheduling Practices and Policies That Mitigate Fatigue	44

This research report represents a clarion call to the health-care system, health-care organizations, governments, nursing associations, unions and regulatory bodies – and nurses themselves – about the rising levels of nurse fatigue. Such fatigue is largely due to the relentless heavy workloads of nurses with ever-increasing cognitive, psychosocial and physical work demands.

The Canadian Nurses Association (CNA) and the Registered Nurses' Association of Ontario (RNAO) are jointly responsible for carrying out the research and producing this research paper. Both organizations have a long history of speaking out for quality health care through policy advocacy. Together, CNA and RNAO have conducted a broad environmental scan – including key informant and focus group interviews, a national survey and a comprehensive literature review – to determine the prevailing norms related to fatigue in nursing and patient safety across Canada. In addition, recommended solutions to this critical issue in health care, targeted to the system, organizations and individual practitioners, have been identified based on the views of nurses and other stakeholders, as well as from literature and research evidence.

The aim is to raise awareness and resolve this health system problem – a goal of vital importance to Canada's nurses and to the public, who expect and deserve safe, competent care from nurses and their health professional team.

The results presented herein represent 7,239 nurses, and depict a profession striving to meet ever-rising professional demands and excessive workloads exacerbated by increasing patient acuity, higher patient volumes and the growing complexity of treatment modalities. At the same time, although those in the profession know the risks of working when fatigued, many tend to pay more attention to the needs of their patients and colleagues rather than to their own needs. While data indicate that nurses perceived they were not making errors due to fatigue, these same nurses reported feeling that patients are in potentially unsafe situations due to workload, inadequate staffing and nurses working while fatigued. The literature corroborates these findings.

The imperative for CNA and RNAO in spotlighting this crucial problem and identifying specific solutions is to guard against unsafe patient situations and stop a potential exodus of nurses from the profession. A continued and fervent focus on nurse fatigue and patient safety is vital in order to prevent lasting adverse effects.

Based on the literature review, various descriptions and experiences of fatigue have been synthesized into the following comprehensive definition of "nurse fatigue":

Nurse fatigue is a subjective feeling of tiredness (experienced by nurses) that is physically and mentally penetrative. It ranges from tiredness to exhaustion, creating an unrelenting overall condition that interferes with individuals' physical and cognitive ability to function to their normal capacity. It is multidimensional in both its causes and manifestations; it is influenced by many factors: physiological (e.g., circadian rhythms), psychological (e.g., stress, alertness, sleepiness), behavioural (e.g., pattern of work, sleep habits) and environmental (e.g., work demand). Its experience involves some combination of features: physical (e.g., sleepiness) and psychological (e.g., compassion fatigue, emotional exhaustion). It may significantly interfere with functioning and may persist despite periods of rest.

Given the urgency of the situation related to fatigue, nursing and patient safety, specific recommended solutions are targeted to policy imperatives at the system and organizational levels, as well as to the role of the individual nurse in mitigating and managing fatigue in nursing. The evidence reinforces that these recommended solutions hold the key to change.

System-Level Recommendations

- 1 Governments at all levels ensure adequate funding aimed at preventing unsafe practices due to rising levels of staff fatigue aggravated by excessive workloads, staff shortages and inattention to safe labour practices. Such funding would support:
 - increasing the number of registered nurses (RNs) to ensure safe care for complex or unstable patients;
 - implementing graduate guarantees to ensure new grads have full-time work (RNAO, 2007b);
 - 70% of full-time nurses in all health organizations so as to foster continuity of care and caregiver, thus increasing quality of care, nurse satisfaction and retention (RNAO, 2005); and
 - other human resources solutions, such as those outlined by CNA to eliminate Canada's RN shortage (CNA, 2009b).
- 2 Governments provide funding to increase nursing enrolments in order to ensure an adequate nursing workforce through made-in-Canada health human resource strategies focused on: expanding the number of qualified faculty in nursing programs, increasing the number of RN seats in education, providing more clinical placement opportunities, and rejecting unethical international recruitment.
- 3 Research groups support new research on the relationship between nurse fatigue and work schedules, adequate rest and recuperation and patient safety, to be carried out in all settings in which nurses work.
- 4 National patient safety and health-care leaders incorporate the issue of nurse fatigue in the national patient safety agenda as a critical factor impacting safe patient care, and the strategy of creating cultures of safety must include mitigating and managing fatigue as a key component.
- 5 Accreditation bodies explore the development of policy standards for health-care organizations that mitigate and manage staff fatigue.
- 6 Nursing associations and nursing unions collaborate to develop consistent advocacy and policy agendas that incorporate fatigue as a factor, at the national, provincial and territorial levels, targeted to governments, health-care organizations and the public. Such agendas focus on creating and sustaining healthy work environments (Griffin et al., 2006) for nurses and providing safe quality care for patients.
- 7 Nursing associations raise awareness about nurse fatigue and its causal factors and consequences related to patient safety, nurse satisfaction, and retention and recruitment at all levels of government, the public and the nursing community. Work with RNAO to develop a best practice guideline related to mitigating and managing fatigue in nursing.
- 8 Nursing regulatory bodies acknowledge issues of nurse fatigue in regulations related to fitness to practise and in management responsibilities for RNs.

Organizational-Level Recommendations

- 1 Health-care organizations promote a culture of safety by establishing a fatigue management policy and program (Quality Worklife-Quality Healthcare Collaborative, 2007, p. 29).
 - Establish scheduling practices and policies for nursing staff (see Appendix C in report).
 - Develop processes to document fatigue in the workplace and its relationship to overtime, maximum hours worked per day and per week, on-call hours, and data related to patient error, staff retention levels and recruitment results.
 - Develop policies that provide time and space for rest periods, meals and other health-promotion initiatives for sleep hygiene.
 - Educate nursing staff and management in recognizing and managing fatigue in self and others, to include understanding the science of sleep, the risks associated with fatigue and approaches to circadian rhythm disturbances.
 - Equip health-care organizations with sleep facilities to enable nurses to minimize their circadian disruptions during evening and night shift work.
- 2 Nursing education programs incorporate, in professional development and clinical courses, information about the impact of fatigue on clinical nursing work, and hours of care on lifestyle and health, and how to manage this aspect of nursing as a career.
- 3 Nursing unions work to mitigate nurse fatigue:
 - Reinforce safe scheduling by limiting hours worked by a nurse (1) in one day to 12 hours, inclusive of shift hand-off, and on-call hours, and (2) in one 7-day period to 48 hours, inclusive of on-call hours.
 - Promote choice of shift type and length for nurses in all health-care settings within a philosophy of continuity of care and caregiver, and create healthy and safe work environments that apply circadian rhythm principles to scheduling.
 - Advocate for review of the extensive use of the 12-hour shift in health-care settings across Canada with a view to introducing a shift length that is more conducive to patient safety and work-life balance.
 - Mount public campaigns about the working conditions of nurses that reflect the issues of workload, hours per day and per week – including on-call and overtime requirements – and the relationship of such issues to patient safety.

Individual-Level Recommendations

Nurses in all roles and practice settings have a professional responsibility to mitigate and manage their own fatigue and provide safe care. They have a professional responsibility to act in a manner that is consistent with maintaining patient and personal safety (CNA, 2008).

- 1 Nurses learn to be aware of, and recognize signs, symptoms and responses to, personal fatigue.
- 2 Nurses understand and work within the policies related to safe patient care within their organizations and within professional practice expectations.
- 3 Nurses take responsibility for mitigating and managing fatigue while at work, including using professional approaches to decline work assignments. When deciding to work extra shifts or when planning work or non-work related activities, nurses act on their ethical obligation to maintain fitness to practice.
- 4 Nurses work through their professional associations, nursing unions and regulatory bodies to advocate for safe patient care through safe scheduling practices in the work environment.
- 5 Nurses support policies, procedures and health promotion initiatives that manage fatigue in the workplace.

More than 250,000 nurses work in a variety of roles, from point of care to senior administration, in all health-care sectors across the country. Canada's nurses wield a significant voice related to key issues prevalent in our health-care system today, and to looming challenges for the future. One of these challenges is the threat to patient safety precipitated by unprecedented levels of fatigue in nurses. A further challenge is the threat to the nursing workforce as the health of nurses is affected by unhealthy work environments and unsafe scheduling practices.

Nurses strive to provide safe and quality care in the context within which they work. From a nursing perspective, patient safety means being under the care of a professional health-care provider who, with the patient's informed consent, assists the patient to achieve an optimal level of health while ensuring that all necessary actions are taken to prevent or minimize harm (CNA, 2009a). Providing safe, compassionate, competent and ethical care to patients within the health-care system is a shared responsibility of all health-care professionals, health-care organizations and governments. Patient safety is fundamental to nursing care and health care; it is not merely a mandate, it is a moral and ethical imperative in caring for others. Providing for patient safety involves a wide range of actions at the level of the individual nurse, the nursing profession and the health-care system. However, the ability to provide safe patient care is currently challenged by a myriad of factors, not the least of which is the consistent understaffing within health care, especially of registered nurses (RNs). Consistent understaffing contributes to nurse fatigue, compromising nurses' health and patient safety.

This research report documents, through a broad environmental scan – including key informant and focus group interviews, a national survey and a comprehensive literature review – the prevailing norms related to fatigue in nursing and patient safety across Canada. Key recommended solutions were sought from participants and the literature in order to bring resolution to this issue of crucial importance to Canada's nurses and to the public, who expect and deserve safe, competent care from nurses and their health professional team.

Both the Canadian Nurses Association (CNA) and the Registered Nurses' Association of Ontario (RNAO) have a long history of speaking out for quality health care through policy advocacy. CNA is the national professional voice of registered nurses, supporting them in their practice and advocating for healthy public policy and a quality, publicly funded, not-for-profit health system. CNA is a federation of 11 provincial and territorial nursing associations and colleges representing almost 140,000 registered nurses and nurse practitioners. CNA's position and policy advocacy on patient safety is based on the *Code of Ethics for Registered Nurses* (CNA, 2008) and the *Patient Safety* position statement (CNA, 2009a). "CNA works in collaboration with nurses, other health-care providers, health system stakeholders and the public to achieve and sustain quality practice environments and positive client outcomes. Research and practice indicate that quality practice environments in all domains of practice will maximize outcomes for clients, nurses and systems. Promoting quality professional practice environments has been a CNA priority since the late 1990s" (CNA, n.d.).

As the professional voice of registered nurses in Ontario, RNAO speaks out for health, health care and nursing and contributes through innovative health policy initiatives; professional development services; and a signature program focused on development, dissemination, implementation and evaluation of nursing clinical and healthy work environment best practice guidelines (Grinspun, Virani & Bajnok, 2001/2002; Scarrow, 2008).

RNAO's best practice guidelines are used provincially, nationally and internationally to shape nursing and health-care policies and practices. All guidelines include evidence-based recommendations that focus on practice, education, organizational policy and system changes. A set of seven guidelines provides clear direction to health-care organizations and management related to creating safe, healthy work environments. These guidelines address:

- workload and staffing;
- workplace health safety and well-being;
- leadership;
- collaborative practice;
- cultural diversity;
- professionalism; and
- mitigating violence in the workplace.

Both CNA and RNAO have integrated the theme of nurse fatigue in much of their work, and have addressed such issues as healthy work environments (QWQHC, 2007; Scarrow, 2008), safe staffing (CNA, 2005; Ellis et al., 2006; RNAO, 2007a), health human resources (CNA, 2006b; RNAO, 2009), nurse shortages (CNA, 2009a, 2009b) and patient safety (CNA, 2009a; RNAO, 2004). While the literature has addressed fatigue in health care – largely from a medical resident point of view – neither this literature nor other entries include a clear and consistent definition of "health-care provider fatigue" (CNA & RNAO, 2009).

In 2006, the Saskatchewan Registered Nurses' Association (SRNA) forwarded a resolution to CNA requesting that CNA develop a position on the maximum number of hours per day and week that an RN should work relative to patient safety. SRNA also requested that CNA consider, through a consultative process, RN responsibilities related to fatigue and duty to provide competent, ethical care (CNA, 2006a). There is a growing need for research and clear policy surrounding the potential negative impact of nurse fatigue on patient safety. The research reported in this document has been developed in the context of the evolving health-care systems (provincial, territorial, federal), the vision and mission of CNA that includes a publicly funded health-care system that incorporates the principles of primary health care, and the growing health infrastructure in Canada.

The project methodology incorporated three strategies:

- 1 broad stakeholder input to the project through selection of a national advisory committee to oversee and to give input to the direction of the project;
- 2 data collection instruments consisting of key informant interviews, targeted focus groups, and a literature and document review; and
- 3 two national fatigue surveys – one for all Canadian nurses, and a shorter one for provincial/territorial and national nursing associations, organizations and regulatory bodies, and patient safety and accreditation organizations in Canada.

All data were synthesized into a comprehensive research paper with a set of recommended solutions.

National Advisory Committee

The national advisory committee (see Appendix A) included members from key stakeholder groups reflective of Canadian geographic regions, sectors, domains of nursing and nursing roles, including nursing regulatory bodies and students. The advisory committee members provided feedback on all data collection methodologies, data analysis and recommended solutions.

Initially, the committee framed the project in the form of a set of key messages that were used to describe the project and raise awareness of the importance of nurse fatigue to safe patient care and a healthy work environment. To guide development of data collection instruments and the literature search, the committee crafted the following working definition of “fatigue”:

Fatigue is defined as an overwhelming, debilitating and sustained sense of exhaustion that decreases one’s ability to carry out daily activities, including the ability to work effectively and to function at one’s usual level in family or social roles. Fatigue is divided conceptually into: the experience of fatigue (such as its intensity, frequency and duration), and the impact of fatigue upon physical, cognitive, psychological and social activities (Glaus, 1998; North American Nursing Diagnosis Association, 1996; Stewart, Hays & Ware, 1992).

With input from the committee, the project team designed and piloted an initial key stakeholder interview with selected committee members prior to broader use with targeted nurses from different roles, sectors and domains. The advisory committee also assisted throughout the project by recruiting participants for all data collection methodologies. Further, committee members were instrumental in screening the literature and documents for inclusion in the review based on a set of inclusion and exclusion criteria.

The project team conducted 12 interviews with key informants from a variety of health-care sectors, responsibility areas and diverse geographic regions across Canada. The sample included two administrators, six clinicians and four informants representing policy, research, union, education and nursing regulatory sectors.

Results of the key informant interviews were analyzed using a qualitative methodology, and data were further organized and categorized using RNAO’s “Conceptual Model for Healthy Work Environments for Nurses” (see Appendix B). The conceptual model depicts a healthy work environment as impacting nurse, patient/client, organizational and societal outcomes. It is made up of physical, structural/policy components, cognitive/psycho/socio/cultural components and professional/occupational components, each with individual, organizational and environmental factors (Griffin et al., 2006).

To confirm and extend the key informant interview results, an overview of the findings was developed and shared with nurses in three different focus groups comprising nurses self-selected from national events that occurred in February and March of 2009. These events were the CNA Nursing Leadership Conference (February 9), the third learning session from the RNAO/Canadian Patient Safety Institute Collaborative on Falls in Long-Term Care (February 10), and the CNA board of directors meeting (March 4).

An online survey of quantitative and qualitative-type questions was developed to survey individual Canadian nurses' views and experiences with fatigue in nursing, including causal factors, impacts and recommended solutions. The key informant interviews provided the basis for the survey questions, which were originally developed by the project team with input from the advisory committee. The completed survey documented the views of 6,312 nurses from all health-care sectors across the country, including nurses of all age ranges and representing various nursing roles, positions and educational backgrounds.

A second shorter online survey was developed and completed by 927 nurses working in provincial, territorial and national nursing associations, organizations and regulatory bodies, educational institutions, and patient safety and accreditation organizations. Similar in format to the individual nurse survey, the questions focused on experiences with nurse fatigue as a factor in patient safety and the work environment, as well as recommendations for solutions. Responses were received from all provinces and territories with the exception of Quebec, providing a rich database related to impacts of fatigue and how best to address those impacts.

The literature review included assessment, data extraction and analysis of six qualitative and 47 quantitative publications, three systematic reviews, 115 non-research articles and 18 position statements. While the issue of nurse fatigue and patient safety has not been heavily researched, and a clear, consistent definition of "nurse fatigue" is lacking, there was a substantial amount of information in the literature to clearly depict causal factors and consequences (CNA & RNAO, 2009).

The literature also reflected a number of recommendations for solutions that can be addressed by individuals, organizations and the health-care system. These solutions, derived from the study of causal factors and nurse expert opinions, were reinforced in the results from the variety of other data collection methods used.

The diverse range of data collection strategies provided opportunities for input and evidence from Canadian nurses from all health-care sectors, roles and domains of practice over the period November 2008 to May 2009.

The results from all data collected reflected a stark similarity to the key findings about causal factors related to fatigue and the impact of fatigue on patients and nurses that were evident in the literature review of research information and policy documents.

In addition, numerous recommendations and suggestions were identified by all research participants and throughout the literature that, if implemented, would have a marked impact on reducing and better managing fatigue in nursing work and thus contributing to greater patient safety.

Key Informant Interviews and Focus Groups

Nurses interviewed and those in the focus group sessions reported that nurse fatigue and patient safety was an important and timely issue of increasing prevalence that crosses health-care sectors and geographic areas. Their comments are a clarion call about the potentially dangerous nature of fatigue for patients and nurses in all settings.

In the words of a policy nurse and a front-line clinician:

"I just think this whole topic is just incredibly important and I think it gets buried. That link from nurse fatigue and patient safety is one that needs to be directly addressed. I think there are patients whose care is compromised because of this."

"Ultimately our staff is getting so worn out, so tired, it's getting a little more difficult to make judgment calls. In the end, it does affect patient safety. It hasn't improved at all; it's actually gotten worse."

"This issue of nurse fatigue and patient safety is becoming more and more prevalent all of the time. I would say over the last couple of years, I've really noticed within our sector [home care], that there's a lot of change that's happening...it's getting worse."

"I think we are just seeing the tip of the iceberg now, and I don't want to create panic, [but] I think we need to be focusing on solutions... I really think people, you know, haven't truly thought about this. I see it happening from my own personal background and knowledge where you don't have other resources to draw on in the community so you are just reusing what you've got – and that tends to be in smaller communities and it tends to be in more rural or remote [communities]."

Participants talked about nurse fatigue as a multidimensional concept involving physical, psychological, emotional and social components that result in lack of energy, physical exhaustion, feeling overwhelmed and a decline in compassion – all of which can further contribute to impaired thinking, decision-making and problem-solving abilities.

The comments shared reflected in a graphic way the above definition of "nurse fatigue," and continually reinforced the impact on nurses' engagement, decision-making, creativity and problem-solving abilities – all critical components for success and safe care in today's fast-paced, highly challenging health-care system.

Nurses were very clear and consistent about causal factors of the increasing presence of nurse fatigue. These factors reflected the components of the "Conceptual Model for Healthy Work Environments for Nurses" at the system, organizational and individual levels. They included

workload, 12-hour shifts and shift work, patient acuity, little time for professional development and mentoring, a decline in organizational leadership and decision-making processes, and inadequate “recovery” time during and following work shifts.

These factors causing fatigue in the minds of nurses resulted in some very serious consequences for nurses themselves, for organizations, for the system and, perhaps most critically, for patients and their families. At the system level, nurses described the “cycle of shortage” in the profession, wherein those in the profession are leaving, sick or discouraged – which paints the profession in a negative light, potentially causing challenges in recruiting and in exacerbating the shortage and workload issues. At the organizational level, key informants conveyed that tired nurses demonstrate poor morale, experience ethical distress, use more sick time and are at greater risk of injury, all at a tremendous cost to the organization. This of course impacts patient safety wherein there is greater risk of errors, falls and physical injury, irregular monitoring and assessment, lack of continuity of care and caregiver, and unclear communication.

Many nurses eloquently described what would help set the stage for solutions they believe need to be addressed using a collaborative approach. They indicated that solutions should involve nurses from point of care to the policy level; researchers; government funders; policy-makers; nursing, professional, regulatory and union bodies; and those organizations that set and monitor standards in health care.

“I felt [the solution] needed to be a joint collaboration between the nurses’ unions, professional associations and academics, with appropriate policy development. ... [Y]ou can disseminate ideas and people can have the best intentions, but... some policy [is needed] ... to back administrators up in terms of their decision-making... staffing and ratios, [and] different supports for nurses...”

Nurses identified other specific solutions involving government at all levels that would support more nurses entering the workforce – thus addressing the growing need for nurses due to predicted retirements as well as issues of fatigue related to workload, shift work and increasing patient acuity. Professional associations were identified as key advocates to articulate the issue of fatigue, work with all levels of government, and foster collaboration of efforts among nurses and nursing organizations. In relation to regulatory bodies, most participants expressed the need for these bodies to ensure reflective practice so as to help nurses solve issues surrounding personal and colleague fatigue, and to help create safe environments for patients.

“[I]t certainly could fit in with reflective practice. ... there really isn’t anything in the assessment that talks about taking care of yourself.”

Other participants expressed that regulatory bodies have in some way addressed the issue.

“[Regulatory bodies] already have, in their ethical guidelines, addressed issues of not working above your knowledge, not working in certain circumstance that you don’t feel safe, [having] more demands than resources, dealing with patient care by priority... They’ve given a lot of guidelines of how to make the decisions.”

However, professional nurses still experience moral distress related to their professional responsibilities to their patients and to themselves. This is particularly evident in today's health-care settings where the culture does not usually support open admission or identification of fatigue as part of patient and staff safety, and workload management requires full – and often over – use of staff to meet patient needs. It does become an issue of moral distress for nurses who know what they should do with regard to working when fatigued, but who often feel a higher moral obligation to their patients and their co-workers than to themselves.

Literature Review

Based on a broad review of the literature of close to 250 publications, including qualitative studies, dissertations, systematic reviews, quantitative studies, non-research articles and position papers, key aspects of fatigue in nursing – how it is experienced, its causal factors and the consequences – were identified.

Fatigue was clearly described as one factor that may affect nurses' ability to maintain the highest standard of care. However, in the large majority of reviewed papers, an operational definition or conceptualization of the term "nurse fatigue" was not apparent. A few studies did provide similar definitions of "fatigue," while other studies described terms such as "compassion fatigue," "accumulated fatigue factor," "managing fatigue" and "chronic fatigue."

In the majority of studies, fatigue was defined as a subjective feeling of tiredness (Ruggiero, 2002; Schaffner, 2006). Total body feelings, ranging from tiredness to exhaustion, create an unrelenting overall condition that interferes with nurses' ability to function to their normal capacity (Ellis, 2008; Ream & Richardson, 1996) and may cause them to be unable to proceed effectively in their work (Johnson, 2008). Although used interchangeably with "tiredness" or "weakness," "fatigue" is much more complex and impairs both physical and cognitive functioning (Ream & Richardson, 1996; Rogers, 2008; Ross, 2008). According to Piper, Lindsey and Dodd (1987, p. 19), it "can vary in unpleasantness, duration and intensity. When acute, it serves a protective function, [but] when it becomes unusual, excessive or constant (chronic), it no longer serves this function."

Furthermore, as a characteristic of burnout, fatigue is experienced as totally physically and mentally penetrative, different from all other kinds of tiredness, and impossible to "sleep off," and is the result of a long-lasting process in which energy is successively drained (Ekstedt & Fagerberg, 2005). Fatigue is frequently measured in terms of physical and mental exhaustion (Dorrian et al., 2006); staying awake or falling asleep (Scott, Rogers, Hwang & Zhang, 2006); and alertness, stress and sleepiness (McClelland, 2007). Symptoms of fatigue include increased anxiety, decreased short-term memory, slowed reaction time, decreased work efficiency, increased variability in work performance and increased errors of omission (Kenyon, Gluesing, White, Dunkel & Burlingame, 2007).

An accumulated fatigue factor was described as the lack of free time at work to refresh oneself, resulting in physical fatigue, sleep and mental fatigue (Kudo et al., 2008). "Managing fatigue" was described as knowing the signs, symptoms and causes of fatigue; sleep physiology and circadian rhythms; sleep hygiene; and preventive strategies for combating fatigue (Grogan et al., 2004).

Chronic fatigue in shift workers is defined as "a general tiredness and lack of energy irrespective of whether an individual has not had enough sleep or has been working hard, which persists even on rest days and holidays" (Verhaegen, Maasen & Meers, 1981, as cited in Barton et al., 1995, p. 11). In contrast to the localized sensation of acute fatigue, chronic fatigue is a global mind-body sensation, perceived without relation to activity or exertion, that has a gradual, insidious onset and a long duration that persists a month or more.

Based on the literature review, various descriptions and experiences of fatigue have been synthesized into a comprehensive definition, as follows:

Nurse fatigue is a subjective feeling of tiredness (experienced by nurses) that is physically and mentally penetrative. It ranges from tiredness to exhaustion, creating an unrelenting overall condition that interferes with individuals' physical and cognitive ability to function to their normal capacity. It is multidimensional in both its causes and manifestations; it is influenced by many factors: physiological (e.g., circadian rhythms), psychological (e.g., stress, alertness, sleepiness), behavioural (e.g., pattern of work, sleep habits) and environmental (e.g., work demand). Its experience involves some combination of features: physical (e.g., sleepiness) and psychological (e.g., compassion fatigue, emotional exhaustion). It may significantly interfere with functioning and may persist despite periods of rest.

Contributing Factors to Fatigue: Literature Review

Several studies in this review examined the contributing factors to fatigue. In a study on the antecedents and consequences of perceived fatigue, 809 nurses identified the following factors that contributed to fatigue: sleep disturbance (snoring, night sweats), lack of exercise, home environment (window shade, bed surface), support (peer support, family support), work schedule (working >40 hours per week, on-call), work environment (work 12-hour shifts, work >12-hour/day, work >three 12-hour shifts in a row, rotating shifts, work 8-hour shifts, on feet 85% of shift) (Schaffner, 2006).

The 12-hour shift and shift work were also identified by nurses in the key informant interviews and focus groups as key contributing factors to fatigue in nursing. A study by Stone et al. (2006) found that nurses working 12-hour shifts experienced less emotional exhaustion than nurses working 8-hour shifts. On the other hand, other research involving critical care nurses found drowsiness and sleep episodes to be more prevalent in nurses who worked more than 12.5 consecutive hours. Also found was that "the risk of falling asleep at work almost doubled when shifts exceeded 8 hours... and increased even more when shifts exceeded 12 or more consecutive hours" (Scott et al., 2006, p. 34). These findings were consistent with a broader study of hospital staff nurses by Rogers, Hwang, Scott, Aiken and Dinges (2004) who sought to determine if there was an association between hours worked and frequency of errors. Nurses who worked shifts lasting 12.5 hours or longer were more likely to make three times more errors. Other consequences of 12.5-hour or longer shifts included increased tendency to fall asleep, lapses in vigilance, decreased alertness, inability to stay focused, reduced motivation, compromised problem-solving, irritability, unusual tenseness, memory lapses, faulty information processing, diminished reaction time, indifference and loss of empathy, and a tendency to make errors in repetitive tasks (Kenyon, Gluesing, White, Dunkel & Burlingame, 2007; McClelland, 2007; Scott et al., 2006).

In a study examining the link between mental health and work outcomes with 4,279 female nurses in Japan, Suzuki et al. (2004) observed an association between nurses who worked the night shift and those who worked irregular shifts as being more likely to commit medical errors.

Using grounded theory to identify structures and processes that facilitate and constrain nurses and agencies from safety in in-patient perinatal settings, Lyndon (2007) reported that the 12 nurses, five doctors and two nurse midwives studied attributed physical fatigue to working long shifts, rotating shifts and night shifts. Mental fatigue was attributed to an overwhelming level of stimulation in the work environment, especially during the day shift. The participants also reported that fatigue was increasingly difficult to manage with increasing age. In a study with 41 nurses, Dorrian et al.

(2008) examined the relationship between sleep, work hours, sleepiness, stress, errors, near errors and observed errors of others, and found the struggle to remain awake to be the primary predictor of errors.

Kenyon et al. (2007) reported on a task force formed by the Association of periOperative Registered Nurses (AORN) in the United States that examined the effects of on-call scheduling and workload on fatigue among operating room nurses. An online survey revealed that 67.7% of the 1,013 perioperative nurses who responded reported the effects of sleep deprivation (being irritable at home and at work, slow response time, family problems, problems sleeping, falling asleep at work). Factors contributing to fatigue included working 34 hours straight, going 1.5 days without sleep, and working many hours over a weekend without breaks or rest periods.

References were frequently made in the literature regarding nurses' mindset, or perception, of fatigue and the contributing factors. Beyea (2004) stated that some nurses view themselves as "invincible" and when asked to work more, they believe that they have the capacity to do so safely. Gaffney (2007) noted that even though nurses know there is a correlation between fatigue and nurse error, they tend to think that "it will never happen to me." A study in Scotland with 352 members of surgical teams (138 consultant surgeons, 93 trainee surgeons and 121 theatre nurses) from 17 hospitals found that "although 79% of surgeons and 73% of nurses agreed that they were less effective when stressed or tired, 52% of surgeons and 63% of nurses still believed that 'even when I'm tired, I perform effectively during critical phases of operations'" (Flin et al., 2006, p. 148). The American Nurses Association (ANA) (2006a) wrote that, regardless of the number of hours worked, a nurse has an ethical responsibility to carefully consider his or her level of fatigue before accepting any assignment beyond a regularly scheduled work day. Moreover, in a related position statement regarding the employer's role in facilitating healthy work schedules for nurses, ANA also noted that employers are responsible for establishing staffing policies and processes that maintain safe staffing levels for quality care, and that recognize the rights and obligations of RNs to decline an assignment if impaired by fatigue (ANA, 2006b).

"While in many countries federal regulations define the maximum hours that can be worked in sectors having a direct impact on public safety (e.g., aviation, transportation), nurses and other health care workers are rarely protected" (International Council of Nurses, 2009, p. 1). Regulatory bodies across Canada have statements in their standards for practice that refer to how to manage situations in which nurses do not feel fit to practise due to fatigue, and many have, in recent years, focused on this in major publications or policy statements (Association of Registered Nurses of Newfoundland and Labrador, 2008; Association of Registered Nurses of Prince Edward Island, 2009; College and Association of Registered Nurses of Alberta, 2006; Nurses Association of New Brunswick & New Brunswick Nurses Union, 2007; Saskatchewan Registered Nurses' Association [SRNA], 2009).

However, the culture of nursing tends to "encourage working to meet the needs of patients rather than extending its view to the possible consequences of working while fatigued" (Ross, 2008, p. 58). Fatigue among nurses has been described by a president of the American Association of Critical-Care Nurses as "a huge and sometimes unspoken issue" (Trossman, 2007, p. 36).

Consequences of Fatigue: Literature Review

In general, most studies reviewed discussed the consequences of nurse fatigue. Using a phenomenological approach, Ekstedt and Fagerberg (2005) interviewed eight individuals (non-nurses) at a stress clinic. The participants reported that fatigue had affected their performance, limited their daily lives, and affected their ability for self-care and for coping with everyday demands. The participants described their fatigue as like living in a vacuum or in a state of "non-existence." Slavin (2007) stated that researchers have found fatigue-related impairments to be comparable to alcohol intoxication impairments.

The myriad consequences of fatigue identified in the literature included: (a) reduction of skilful anticipation and patient safety (Lyndon, 2007); (b) diminished judgment, degraded decision-making, slowed reaction time and lack of concentration (Gaffney, 2007; McClelland, 2007); (c) absenteeism (Zboril-Benson, 2002); (d) clinical errors, failure to rescue, falling asleep when driving home; and (e) interpersonal consequences, including decreased quality of interaction with colleagues and patients (Schaffner, 2006).

In addition, several studies specifically examined the impact of fatigue on errors and found the following:

- Nurses' fatigue was one of the top three causes of drug errors identified by nurses, along with physician's handwriting and nurses' distraction (Mayo & Duncan, 2004).
- 16.5% of the nurses in a study by Deans (2005) identified fatigue as a cause of medication errors.
- All groups on the health-care team demonstrated poor recognition of the potential impact that stress and fatigue played on error occurrence and job performance when Grant, Donaldson and Larsen (2006) assessed safety culture in a children's hospital.
- In a study of 23 full-time nurses, significantly lower levels of alertness and higher levels of physical exhaustion, mental exhaustion and stress were reported on workdays compared to days off. Sleep was significantly shorter on days when an error or near error was recorded and longer on workdays when another nurse's error was recorded. Sleep duration was a significant predictor of error/near error occurrence, with the likelihood of an error being reduced by 27.3% with every hour of sleep. The highest percentage of errors occurred during the morning (14%) (Dorrian et al., 2006).
- Of 686 nurse participants who reported experiencing the effects of sleep deprivation in a survey conducted by the AORN, 58% felt unsafe while providing patient care, 13% stated they had made patient care mistakes because of fatigue, and 38% reported fatigue-related near errors. Incidents included documentation problems, selecting the wrong implant, not being able to focus while counting, and missing items during patient assessment (Kenyon et al., 2007).

Solutions to Mitigate and Manage Fatigue in Nursing: Literature Review

The literature, which included position papers and association directives, provided some direction to possible solutions. A number of these solutions were related to the individual nurse, reinforcing the nurse's ethical, professional and health-related responsibilities. Solutions included:

- Uphold the ethical responsibility to patients and self by arriving at work adequately rested and prepared for duty (Banerjee, 2003; Brugne, 1994; Kenyon et al., 2007; National Association of Neonatal Nurses [NANN], 2008).
- Recognize personal limits and decline requests to do overtime if fatigued (Balas, Casey, Scott & Rogers, 2008; Dean, Scott & Rogers, 2006; La Pine, Malcomson, Torrance & Marsh, 2006), not work when too tired to work (ANA, 2000) and not work more than 12 hours/day, 60 hours/week (NANN, 2008).
- Find time for rest and recreation to minimize the effects of shift lag (La Pine et al., 2006).
- Facilitate the development of strategies to buffer the negative effects of stress (Wagner & Jason, 1997).

- Take control of sleep and make sleep a priority (Balas et al., 2008; Beyea, 2004; Bodin, 2008; Cady, 2008; Dean et al., 2006; Ellis, 2008; Hughes & Rogers, 2004; NANN, 2008; Scott, 2008; Slavin, 2007; Windle, Mamaril & Fossum, 2008).
- Take uninterrupted breaks and plan opportunities for rest such as power naps at work (Balas et al., 2008; Beyea, 2004; Cady, 2008; Dean et al., 2006; Ellis, 2008; Hughes & Rogers, 2004; NANN, 2008; Scott, 2008; Windle et al., 2008).
- Develop a personal commitment to work-life balance and regular exercise, which includes limiting caffeine, eating nutritiously and ensuring adequate fluid intake (Balas et al., 2008; Bodin, 2008; Cady, 2008; Dean et al., 2006; Hughes & Rogers, 2004; La Pine et al., 2006; Scott, 2008; Slavin, 2007; SRNA, 2009).
- Educate self about fatigue and its potential impact (Beyea, 2004; Ellis, 2008). In a study examining the impact of aviation-based teamwork training on the attitudes of 463 health-care professionals, Grogan et al. (2004) found that training improved the participants' attitude toward fatigue management.
- Recognize when personally at risk, consider the impact of having multiple jobs, document unsafe staffing conditions, and possibly confront a nursing colleague who is too fatigued to work (Sullivan, 2007; Wisconsin Nurses Association [WNA], 2007).
- Develop a partner system to check on each other's alertness at work, support tired co-workers and let them support you (Balas et al., 2008; Cady, 2008; Scott, 2008).

Other solutions were targeted at the organizational level and included policies and actions that organizations could adopt that would demonstrate their commitment to safe working environments for nurses and patients. These included:

- Promote shift rotations that are scheduled every one or two weeks to allow for adaptation of circadian rhythm (SRNA, 2009).
- Promote work schedules that provide for adequate rest and recuperation between scheduled shifts. Ensure that nurses do not work more than 12 hours in a 24-hour period, and no more than 60 hours in 7 days (Scott et al., 2006; SRNA, 2009).
- Ensure staffing systems are in place and develop policies and procedures that foster a safe and healthy environment (e.g., appropriate staff mix and work design given patient acuity, flexible schedules, policies that promote institutional loyalty and retention) (Aiken, Clarke, Sloane & Sochalski, 2001; Aiken, Clarke, Sloane, Sochalski, Busse et al., 2001; Berland, Natvig & Gundersen, 2008; Hughes & Rogers, 2004; Marjanovic, Greenglass & Coffey, 2007; QWQHC, 2007; Ruggerio, 2002; SRNA, 2009; Ulrich, Buerhaus, Donelan, Norman & Dittus, 2005).
- Develop a system-based approach in health-care organizations that limit causes of fatigue in the workforce and reduce the potential for human error. Factors that contribute to fatigue beyond sleepiness such as job stress should be part of the multifaceted strategy (Carlton & Blegen, 2006; Dawson & Fletcher, 2001; QWQHC, 2007; SRNA, 2009).
- Develop education and orientation programs for nursing staff that include information related to the science of sleep, risks associated with fatigue, mechanisms that underlie fatigue and sleep disorders, circadian rhythm disturbances and approaches to optimize performance (Dean et al., 2006; Ekstedt & Fagerberg, 2005; Ellis, 2008; Gaffney, 2007; Hemme Froslic, 2007; La Pine et al., 2006; QWQHC, 2007; Schaffner, 2006).
- Adopt strong transformational leadership that stresses patient safety and makes it a priority for the organization, along with a capable workforce that reflects safe staffing levels, knowledge and skills, and interdisciplinary collaboration (Hinshaw, 2006).

- Assess the organization's fatigue awareness culture; "enter the discussion informed about the topic" (Ross, 2008, p. 59). Ask insightful questions such as: What do you see in the course of your workday regarding fatigue? Are you working shorthanded? How often? Do you come to work when fatigued? Do your coworkers? (Windle et al., 2008).
- Develop policies related to work schedules (Kenyon et al., 2007) that limit numbers of hours worked per week, and per 24-hour day, and include on-call hours in the calculation; include time in the shift for appropriate patient hand-off; stipulate minimum hours of off periods for sleep, carrying out activities of daily living and taking a break from continuous personal responsibilities; and adopt a culture of worker and patient safety so that fatigue is recognized as an unacceptable risk rather than a sign of a worker's dedication to the job.

Finally, solutions documented at the system level that would aid nurses and organizations in addressing fatigue included the following:

- "Policymakers consider the impact of the aging nursing workforce ...[especially the] growing number of older nurses who are required to work rotating shifts" (Admi, Tzischinsky, Epstein, Herer & Lavie, 2008, p. 256);
- "Future studies continue to explore the effects of shift work through objective indicators measuring sleep disorders, adaptation to shift work and biological markers of health problems" (Admi et al., 2008, p. 257); researchers focus on understanding the impact of shift work and overall hours, and link this issue to the nurses' code of ethics (WNA, 2007);
- Researchers pay closer attention to system interactions within work environments (research outside health care may provide some answers) (Montgomery, 2007);
- Schools of nursing add the topic of nurse fatigue and patient safety to their curricula, and this issue must be linked to the nurses' code of ethics (WNA, 2007).

National Nurses' Survey

Demographics

The national survey of 6,312 registered nurses from across Canada further corroborated the findings in the literature related to nurses' experiences of fatigue and their perceptions of the consequences, as well as to many of the solutions. The findings indicated no appreciable differences among nurses working in different provinces and territories, sectors and roles in their behaviour related to fatigue, nor in their ideas of what solutions should be implemented to reduce fatigue. The differences that did exist among nurses in different locales were evident only in their opinions of the most important contributing factors to fatigue. Nurses from New Brunswick, Prince Edward Island, Northwest Territories, Nunavut and Yukon perceived a number of factors contributing to nurse fatigue. Conversely, nurses from Ontario, British Columbia and Quebec considered only increased workload and working short staffed as the most important factors causing fatigue. However, across the country, increased workload was considered to be the *most important* factor contributing to nurse fatigue

The majority of participants were female aged 45-54 years (35%), with the next largest age groups being 55-64 (20.9%) and 25-34 (20.4%), and those 24 and under and 65 and older being represented by 3.6% and 1.3%, respectively. The majority had no children at home; those who did had children who were older elementary school age to adolescent; 79% had no other dependents living with them. Slightly more than half (50.9%) were baccalaureate, masters and doctoral-prepared nurses, with the other half RN-diploma nurses (42%), some of whom had additional certificates.

Most participants worked in a hospital setting, with 31.9% from acute care teaching hospitals and 25.8% from community hospitals. The remaining participants represented long-term care (8.4%), home health care (5.5%), public health (5.4%), mental health (4.2%), education (3.1%), primary care/family practice (2.6%), and provincial nursing association/regulatory body (0.5%), thus reflecting the range of health-care sectors in which nurses work. With close to 70% of participants working as staff nurses, and 7.5% working in the nurse manager role, the results largely depict the views of nurses in active clinical and management practice at the point of care.

Just more than half of the participants indicated the most common reason for missing work was due to physical illness, with 15.9% off work due to a stress-related illness. Almost two-thirds worked in one position only, with 64.4% working as full-time permanent staff, 3.1% working full-time temporary, 23.7% working part-time permanent, and 7.1% working casual or for an agency. A large majority (91.4%) revealed that their current employment status was by choice, while 8.6% said it was not. Just over half of the participants reported working unpaid hours on a weekly basis, with the average per week being 1 to 5 hours (38.9%), 6 to 15 hours (14.2%), and 16 to 25 hours (3.2%). The issue of choice presented a real dilemma for nurses to explain when asked whether overtime paid or unpaid was by choice. While many reported it was not by choice, those that worked by choice indicated they felt a moral and ethical obligation to do so, so as to ensure quality patient care. Their words indicate the complexity of the issue:

"[I] [w]ork many hours...[and]...on my own time. Is it my choice only because work life is so busy that you cannot fit everything in that is expected of you. The more time I spend, it only makes my work life manageable. Something is certainly wrong with this picture."

"I work unpaid hours because [i]n order to be ready for my [p]atients and on the floor as early as possible, I have to come 15 to 30 minutes earlier in the morning or before any shift. My manager also calls it the "culture," in other words, it is expected for us to be early. However, we are not expected to get paid, even though it is known to be necessary for safe patient care. Also, we are often required to stay 15 to 30 minutes later to be able to finish things such as documentation, usually because we did not have time to document during the shift (usually day). Or sometimes patients' conditions worsen, aggravating work load and delaying other responsibilities that must be met before leaving. It is my sense of responsibility and [my] own decision to stay longer."

While it may seem reasonable for a professional to be at work in advance and to spend some time after hours concluding the day, the above quotes from nurses reflected that they did not perceive they had a choice in this but rather were required to spend this additional time in order to meet the needs of their patients.

"In a managerial role, it is not always possible to meet deadlines in a regular 7.5-hour day. I choose to work extra hours in order to stay on top of the workload. Driving to meetings at another site is also considered as hours worked."

Overall, the profile of survey respondents describes nurses in early, mid and later career phases; with relatively older children at home and few other dependents; and working in an employment status of their choice: mainly one full-time or part-time permanent position. Thus, any reported fatigue may be attributed to the nature of nursing work in their primary role rather than to numerous family and other job responsibilities.

The survey results demonstrate some interesting patterns that help describe the nature of nursing work and its contribution to nurse fatigue:

- The day shift was most often worked; however, 32% worked nights, 25.6% worked evenings, and 26.2 worked rotating shifts.
- 25.5% had a second position by choice, either on a casual, part-time permanent or temporary basis.
- For these second positions, nurses reported working anywhere from 1 to 40 hours on average per week, with 27.9% working 5 to 10 hours (the most common number of hours).
- In their second position, close to 71% of nurses did not work any unpaid hours; however, 20% worked 1-5 unpaid hours on average per week, and the remaining almost 10% worked 6 to more than 35 unpaid hours on average per week.
- 17.9% had a third position by choice, in which the vast majority reported spending no more than 10 hours per week.
- In their third position, almost 17% reported working up to 5 unpaid hours on average per week.
- Almost 30% of all participants reported changing shifts once a week.
- 11.4% reported having 8 hours or less between shifts, and considered this to be "short change."

"I have insufficient time off between overtime and regular work day... [I am] called in throughout the night."

- 41.4% of nurses reported having 9-12 hours between shifts.
- 28.9% of nurses worked "on call" for 1-5 hours to more than 70 hours a week. Approximately one-third chose to be on call, and just over 50% chose the number of on-call hours they worked. Some nurses said they were on call "all the time."
- Slightly less than 20% were assigned to areas where they had limited experience; for most of these nurses, this occurred 1-5 times on average per week.
- While 60% were not required to care for patients with health conditions of which they had limited knowledge or experience, approximately 25% indicated this was their experience 16-20 times on average per week.
- While the vast majority reported taking a vacation at least once a year, and many two to three times a year, 6.4% were not able to take an annual vacation, and 5% never took vacation.

Contributing Factors to Fatigue: Nurses' Survey

Nurses were also asked to share information about fatigue in nursing: how pervasive it was and what contributed to it. Responses show that a significant number of nurses in all cases are greatly impacted by fatigue largely related to workload and short staffing, however, a variety of other organizationally related issues such as relentless change, functionally disorganized workplace and feelings of sensory overload were also identified.

- 50% indicated they missed shifts due to fatigue, the most common number being between one to five shifts over the past year. This behaviour was most prevalent in nurses in the oldest age ranges.
- 60% of nurses indicated they never or only occasionally felt fatigued before beginning to work; 55.5% felt fatigued during work almost always to all the time; 80% of nurses felt fatigued after work almost always to all the time; and 80.8% said they heard their colleagues express feelings of fatigue almost always to all the time.
- 41.7% indicated they observed fatigue in their students.
- Approximately 90% of nurses felt their work was cognitively demanding almost always to always over the past year; 90% felt work was psychologically demanding; and 60% felt it was physically demanding.
- The top five factors contributing to fatigue in nurses were increased workload, working short staffed, increasing expectations from patients and families, high levels of patient acuity and unexpected emergency with staffing or patients. Nurses also identified a feeling of sensory overload, functionally disorganized workplaces and relentless change within the workplace as contributors to their fatigue.
- When asked to identify the one most important factor contributing to fatigue the most frequent response mentioned by almost 22% of nurses across all age groups was "increased workload." Nurses described this workload as heavy, stressful, increasing in intensity and contributing to overtime hours.
- Although nurses reported feeling fatigue at work, the majority, 85.1%, indicated they almost never missed work due to fatigue. Fifty-six percent (56%) of nurses had never or almost never declined overtime shifts due to feelings of fatigue.
- Almost 95% of participants reported that they felt they never committed an unsafe practice resulting in an adverse event due to fatigue.
- Fatigue has had its impact on nurses with 25.8% considering resigning; 20.2% considering retiring; and 25.6% considering leaving the profession due to fatigue. Acts to address the fatigue issue could have a major impact on retention in nursing.
- In spite of the levels of fatigue that nurses experienced due to the work context, 90.4% of nurses indicated that their organization had not developed policies and procedures to address fatigue.

Many nurses provided numerous comments that reflected the prevailing view that nurses: are experiencing fatigue; work even though fatigued; feel little support from management in helping to identify and respond to personal fatigue levels, but rather direct or indirect pressure to work more hours; choose to work extra hours even without pay because they feel the work needs to be done for patients and for their colleagues; and have many issues with the schedule, especially 12-hour shifts.

Among the descriptions of organizational culture related to fatigue was the “hero” culture, which can reinforce “stoicism and martyrdom” in the face of fatigue.

“The ‘hero’ culture means that the nurse is always responsible for making sure everything goes smoothly for the patient, the family and the other health-care professionals, while leaving herself/himself ‘last on the list’.”

“As community nurses we are considered the all-round nurse ... with much knowledge and skills in the nursing field. It just seems more and more responsibilities are expected of us and if we don’t do it, we are considered negligent in our role as community nurses. I think one can only extend oneself so far before fatigue, apathy and frustration set in, which in turn makes one very unhappy in a profession that we entered because we love [nursing] and wanted to be a nurse. But how far do we extend ourselves before we break down emotionally, physically and mentally, not to mention spiritually?”

Several nurses expressed how the other aspects of culture in the organization reinforced working when fatigued. It is the experience of many nurses that they work without taking any breaks – especially difficult when nurses work 12-hour shifts. Some participants identified a workplace culture of “missing breaks,” suggesting a lack of support from management to ensure nurses take their breaks. In some ways, nurses find themselves in a “no-win” situation as they know they should not work while fatigued – and there are supports within nursing regulations to reinforce this – yet as professional caregivers with the needed knowledge and skill, ethically they feel they cannot withdraw from the situation.

“The culture of management is from an era where you just ‘did what you had to do with what you [had].’ Management puts forth little time or energy into fixing problems on a permanent basis.... Few women of this era know how to take care of themselves and many do not think they are ‘worth it,’ always putting themselves last. If you do exercise self-care, you become a target for women who are unable to give themselves self-care and actively resent those who strive for balance in personal and professional spaces.”

While nurses at the front line may see their immediate manager as non-supportive, it is important that management at all levels, and throughout the entire health-care system, work to reduce the ethical burden on nurses that adds to their fatigue. Managers can help by refraining from requesting nurses to work overtime, encouraging and making breaks possible, and seeing that nurses leave shifts on time. Such measures reflect a broader understanding of a culture of safety that must be adopted in our health-care system, along with other key interpersonal, structural and process changes.

It is evident from participant comments that supportive management is integral to nurses' feelings of and response to signs of fatigue in themselves and their colleagues. Supportive management was characterized in various ways, yet each is integral to mitigate fatigue among nurses. Participants suggested that managers ensure nurses take all allotted breaks, that they recognize unsafe workloads, and that they do not mandate nurses to work if fatigued.

"Front-line managers need to be proactive to ensure that their staff take all required breaks...."

"[Supportive management is]...management that recognizes unsafe workloads and doesn't just deal with it retroactively..."

"Management should not mandate nurses to work if they feel that they are too tired to work. Excess pressure is applied to staff nurses due to nursing shortages."

Participants also suggested that management be accountable for their decisions and behaviours with regular evaluation.

"Regular evaluation/accountability of management around their management of staff needs, not just budget, [is needed]."

"We need [m]anagement that is accountable and responsible for providing safe, fatigue-free work environments for nurses/health-care professionals. A lack of accountable management is the root of the problem. Management is rewarded for cost cutting only, not for retention of nurses. In almost every organization, the disconnect between management's experience and the reality of the hospital is the primary issue."

On the other hand, some nurses explained that they took extra shifts or worked in an alternate position for professional reasons so as to be able to do more clinical work and keep up their skills. In the words of one nurse, "all of these shifts are overtime at the bedside; [it's] my choice to keep my skills current." Other comments reinforced that nurses were aware of organizational and system issues and felt the need to respond to requests to help out:

"We are short staffed and I fill in when there is no one else to work. When we are short staffed I will also fill in for shifts that cannot be covered on our acute in-patient psych[iatric] unit."

"Night shifts are very hard on my body and I prefer not to work then; however, my employer is always stuck for staffing and I end up being called [at the] last minute to cover shifts."

Finally, raised as a critical factor in fatigue was the issue of scheduling, lack of flexibility in number of hours worked per shift and the 12-hour shift itself – in particular, rotations that are two days and two nights. As one nurse put it, "it is like being in a constant state of jet lag."

Other nurses describe the 12-hour shift as simply exhausting:

"The 12-hour night shifts with 1 hour and 30 minute (90 minutes) night breaks are too exhausting. Because we usually nap during our breaks, waking up in 90 minutes means we're being roused from the start of REM stage of sleep, which leaves us even more tired. So RNs take an extra ½ hour (total of 2 hours) to allow [for] a deeper, more rested sleep. However, this is highly discouraged by our operation's leader."

"I have been [w]orking shiftwork, 12-hour shifts, days and nights, four in a row. The night shifts are getting more difficult the older I get."

"I have found, personally, that working 12-hour shifts plus nights plus taking care of a family has made me feel exhausted, [with] loss of short-term memory, and [I am] unable to cope with events in life that I used to be able to handle, no problem."

"Love nursing but hate the shift work...have no other choice but to work two 12-hour days, then two 12-hour night shifts. This type of schedule is crazy!"

Consequences of Fatigue: Nurses' Survey

The impact of the levels of fatigue in nurses, as identified in the literature and expressed by the key informants in the project, clearly affects nurses' judgment, decision-making and problem solving, and has been associated with increased errors and near errors.

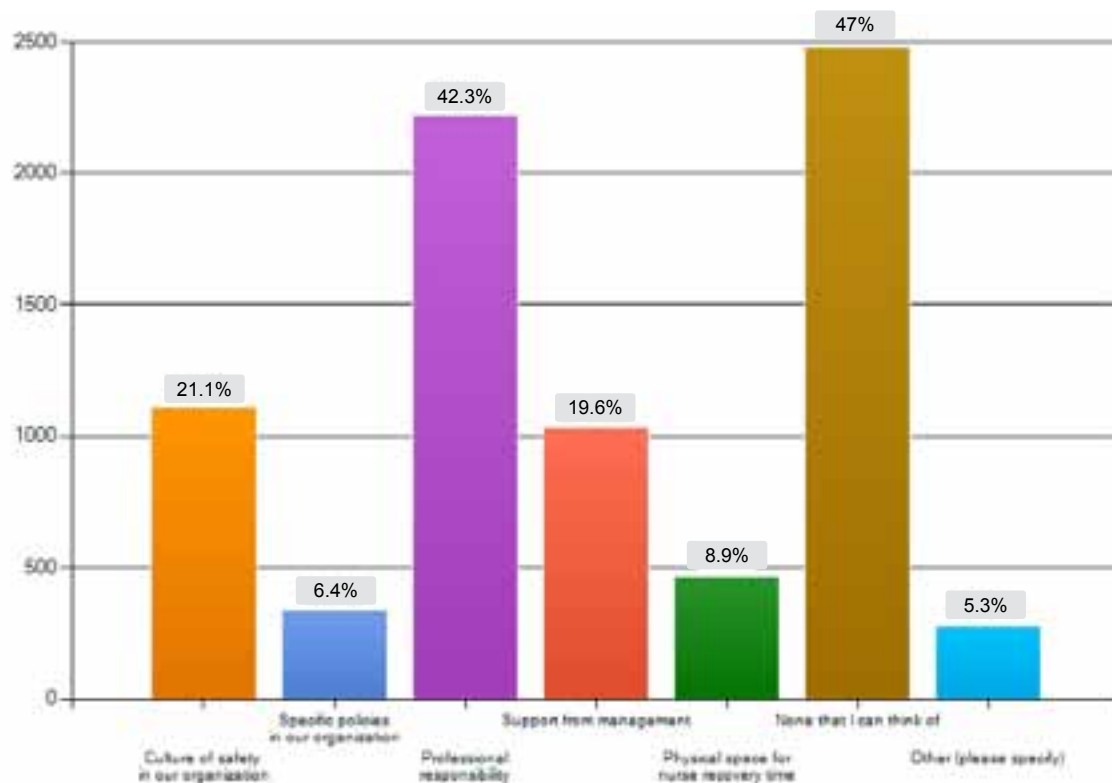
In the cross-Canada survey, while nurses expressed their levels of fatigue as related to the increased workload, they also identified working short-staffed as a second-most important reason. This may be why 56.6% of these nurses indicated they almost never declined overtime shifts due to feelings of fatigue. This behaviour was most prevalent in nurses in the 18-34 age range. Although participants felt fatigued frequently, colleagues rarely encouraged them to stop working when visibly fatigued. Just more than 25% indicated they had observed unsafe practice related to fatigue of health professionals, and just less than 20% indicated they believe fatigue affected their ability to provide safe, compassionate, competent and ethical care. However, almost 95% of participants reported that they never to almost never commit an unsafe practice resulting in an adverse event due to fatigue.

Factors Assisting and Preventing Response to Fatigue

Participants were asked to identify the organizational factors that assisted them in responding to signs of fatigue in themselves or in colleagues, and approximately 47% of nurses were unable to identify any. Professional responsibility was named as a factor that assisted in responding to signs of fatigue by 42% of participants. An organizational culture of safety, support from manager, physical space for recovery, and specific organizational policies were identified factors that assisted nurses and their colleagues in responding to signs of fatigue (21.1%, 19.6%, 8.9% and 6.4%, respectively). Five per cent provided additional comments such as professional development opportunities and support from colleagues, which were analyzed and are presented in the qualitative section of this report. These results are depicted in Figure 1.

Figure 1.

Workplace factors assisting response to fatigue



The organizational factors that participants perceived to prevent them from being responsive to feelings of fatigue in themselves and others are summarized in Table 1.

Table 1.

Organizational factors preventing response to fatigue

ORGANIZATIONAL FACTOR	RESPONSE FREQUENCY
Workload	72.6%
Professional responsibility of being there for the patients	70.2%
Feelings of not letting down the team	66.4%
The culture of doing more with less	59.5%
Perceived expectations from management	45.5%
Lack of support to take breaks and be appropriately covered over this time	36.7%
No time in the work shift to ever get away for recovery time	36.4%
Confirmed expectations from management	33.1%
No place in the organization to go for recovery	27.7%
Lack of enforcement of policies related to taking breaks	24.5%
Lack of policies related to taking breaks	13.9%
None that I can think of	5.5%
Other (please specify)	4.9%

Several of the factors had relatively large response frequencies, indicating that participants perceived several organizational factors prevented them from responding to fatigue in themselves or others. *Workload* was the organizational factor most prevalent in preventing nurses from responding to feelings of fatigue. *Professional responsibility of being there for the patients* was reported by 70.2% of nurses as preventing response to fatigue in themselves and others.

Just over sixty-six per cent (66.4%) believed that their *feelings of not letting down the team* prevented them from being responsive to feelings of fatigue. It is unclear what, specifically, participants felt. Perhaps participants were referring to the acknowledgement of fatigue in themselves and others that is interpreted as being weak and non-resilient and therefore, letting down the team. If this is the reason why feelings of letting down the team prevented adequate response to fatigue, it may help to explain why 59.5% indicated that *the culture of doing more with less* prevented response to fatigue.

It is clear that participants have experienced an increase in workload. This increase has been considerable to the point where nurses believed there exists an organizational culture of "doing more with less" and without complaint. As such, cultural undertones of the organization to "work more" may limit acknowledgement of and response to fatigue in oneself and others, as it would be counterproductive to a "work more with less" culture.

Management had a significant effect on nurses' response to fatigue. Specifically, 45.5% indicated that *perceived expectations from management* prevented participants from responding to feelings of fatigue in themselves and others, while 33.1% indicated that *confirmed expectations from management* prevented them from responding to feelings of fatigue in themselves and others. Because of these responses, it is hypothesized that management expectations may include managing increased workloads and patient acuity, and accepting a culture of doing more with less.

Solutions to Mitigate and Manage Fatigue: Long Survey

The respondents provided a number of solutions to address fatigue in the workplace from the individual, organizational and systems level. However, the majority of their recommended solutions fell within the organizational level focused on physical/structural/policy components, cognitive/psycho/socio/cultural components and professional/occupational components of a healthy work environment within the *Conceptual Model for Healthy Work Environments for Nurses*.

Key themes reflected in the comments related to the physical/structural/policy components were:

- adhering to labour laws and increased funding;
- health factors, such as physical work environment and space for recovery;
- health and wellness programs, including opportunities to eat healthy while at work;
- staffing practices and policies; and
- decreasing horizontal violence.

"Hospital employers should be adhering to [the] Employment Standards Act, which dictates that no employee may be required to work more than 45 hours per week, [and] no employee may voluntarily work more than 60 hours per week. But hospitals ignore this. Lots of nurses [are] doing six, seven or more consecutive extended 12-hour tours in excess of 60 hours and they keep getting called and they keep accepting the calls."

"More funding for more nurses working as front-line workers. More funding to improve the physical setting of the workplace."

"[A] quiet room (no TV) for staff to lie down/relax in easy chairs on breaks...like sleep rooms for MD's. Somewhere to de-stress."

"Provision of good nutrition food service after hours."

"[L]ook at the safety of 12-hour shifts, the safety for the nurses working, as well as patients' safety."

"[E]rgonomist to help assess workload, area of work and [to] help make [the] work environment more user friendly."

Key themes reflected in the comments related to the cognitive psycho/social/cultural components included:

- management practices; and
- workplace culture of doing more with less.

"[M]anagement that is accountable and responsible for providing, safe, fatigue-free work environments for nurses/health-care professionals. A lack of accountable management is the root of the problem. Management is rewarded for cost cutting only, not for retention of nurses. In almost every organization, the disconnect between management's experience and the reality of the hospital is the primary issue."

"[C]hange the culture of martyrdom – working until exhaustion or you drop – to one that demands respect and appropriate staffing, adequate and appropriate debriefing, collegial problem-solving and leadership training. Nurses need more reflection time and involvement in building their infrastructure and policies."

"The change in attitude must start with the top people in the organization and there must be demonstrated value for nurses, not just empty lip service."

Key themes reflected in the comments related to the professional/occupational components included the following suggested solutions:

- incorporate accreditation standards that address nurse fatigue and other related issues;
- provide education for nursing students that reflects the reality of nursing work and helps students prevent, recognize and manage fatigue; and
- employers refrain from relying on nurses to complete non-nursing activities that decrease time with and for patients, contribute to poor morale and increase fatigue.

"I think an educational program as part of the curriculum would help, which deals with the concepts of work-related stress, fatigue, how to manage it, as well as learning to develop a personal healthy lifestyle profile. Putting it into practice over the course of their education... would help when they enter the workforce and have to deal with it. They can become better mentors/educators for others and clients in promoting healthy lifestyles."

"Lobby the government to regulate hours of work. It has long been studied that shift work contributes to worker fatigue."

Other solutions focused on government activities that should be initiated. These included a focus on retention and recruitment, funding to ensure safe staffing levels, increasing seats in educational programs, and more research on the impact of fatigue and patient safety.

Nurses also reinforced the need for organizational-level changes from a physical, structural and policy perspective. More specifically, nurses were looking for someone within the system to advocate for and ensure the following:

- increased funding from governments;
- reasonable workloads;
- safe nurse-patient ratios;
- increased supply of nurses;
- limited overtime hours;
- healthy work environments;
- safe and flexible scheduling practices;
- mandatory breaks and vacation;
- supply of nurses with adequate knowledge and experience; and
- provision of fatigue and stress education preventive strategies.

Participants provided a range of possible activities they believe nursing associations can take to reduce fatigue. The themes that emerged are presented in Table 2.

Table 2.

Nursing association activities to reduce fatigue

COMPONENT	LEVEL	ACTIVITY
Physical/Structural Policy	System	<ul style="list-style-type: none"> • government for funding • reasonable workload
	Organizational	<ul style="list-style-type: none"> • safe nurse/patient ratios • increase nurse supply • healthy work environment • safe and flexible scheduling practices
	Individual	• N/A
Cognitive/Psycho/Socio/Cultural	System	• public awareness
	Organizational	• N/A
	Individual	• N/A
Professional/Occupational	System	<ul style="list-style-type: none"> • fatigue education and support • increase research about fatigue • fatigue prevention best practice guidelines
	Organizational	• N/A
	Individual	• N/A

Respondents described nursing associations as having an advocacy role in reducing workplace fatigue. Several themes are similar to what nurses raised throughout the survey. The participants felt it was important to involve the public more in this issue and to raise awareness of the potentially unsafe conditions in which some nurses work that contribute to their fatigue. Respondents also emphasized that more research and education about fatigue, its contributing factors and impacts, and how to mitigate and manage it, was critical. In particular, nurses recommended a best practice guideline be developed in this area. Similarly, the nursing unions were identified as a key group to be involved in collaborative action to address fatigue.

Participants also recommended that, through their clinical experiences and education about self-care and work-life balance as a nurse, students be better prepared for shift work as well as the cognitive, psychological and physical demands of nursing. In addition, participants indicated students and new graduates need to be made aware of the impacts of fatigue on patient safety, nurse satisfaction, burnout and retention.

"Ensure that nursing students are aware of the real possibility of developing nurse fatigue, and empower them with the skills to maintain a work-life balance and take care of themselves first. You can't be a good caregiver if you need care yourself!"

"Ensure that self-care is part of [the] curriculum. Teach students about the importance of fatigue and patient safety."

Many participants highlighted areas and activities they as individuals could focus on as solutions to fatigue in nursing. Many activities fall into the professional/occupational component of a healthy work environment. The comments reflect a cohort of nurses who are seriously concerned about how to alleviate the fatigue factor in their workplaces, whether it is to raise awareness of the levels of fatigue in the workplace, support their colleagues to reduce fatigue, or take personal and professional action so as to manage their own fatigue levels.

"Do not work more [overtime] shifts than your body can tolerate."

"To be persistent and bring attention to the issue that...[p]atients are being affected by the amount of fatigue being felt by nurses related to increased workload, increased acuity and scant staffing levels."

"We as nurses try to hold each other up and encourage each other. It helps. It sometimes is enough to know that you are not alone."

"Look after my own health, and exercise. If I live a healthy lifestyle, then I am better able to manage my own fatigue levels."

"Recognize it [fatigue] exists and make efforts to recognize and deal with stress before it becomes debilitating."

"[B]e informed of the signs of fatigue and know when to take time for yourself."

"Review professional responsibilities to uphold public safety, recognize your limits and learn to say no."

"[F]ill out professional responsibility forms where staffing continues to be inadequate and the workplace unsafe."

National Organizational Survey

The organizational online survey included responses from 927 health-care professionals. All provinces and territories were represented except for Quebec. Respondents identified that they worked in acute care teaching or community hospitals, long-term care facilities, public health, northern nursing outpost clinics, federal government organizations, air ambulance care organizations, regional health authorities, mental health centres, community health-care centres, clinics and tribunal councils.

The results from this survey were consistent with the results from the individual nurse survey. In particular, there were numerous overlapping solutions to the issue of nurse fatigue related to recommended actions of government, professional associations and regulatory bodies and nursing unions.

Respondents articulated clearly the prevalent issue of nurse fatigue, which negatively effects patient safety. Numerous solutions to prevent workplace fatigue were suggested, indicating the complexity of the issue and therefore requiring a multi-faceted and comprehensive management strategy. Moreover, the repetition of solutions from both surveys delineates respondents' beliefs that mitigation and management of nurse fatigue and patient safety requires strategic collaboration of all parties.

These results strongly suggest that nurse fatigue is not only a prevalent issue throughout the Canadian health-care system, but that it necessitates a multi-faceted and comprehensive approach to manage it effectively. Participants from the organizational survey expressed the importance of collaboration among employers, nursing associations, regulatory bodies, nursing unions and educational institutions so as to promote widespread awareness, support and change, as well as to possess sufficient collective power to obtain increased government support.

The data paint a picture of nurses wanting to do the right thing for quality patient care, yet being caught in a set of competing priorities of taking care of themselves so as to be a productive member of the work team, responding to the increasing need to lengthen their day, decreasing their time off and working harder relative to the excessive workload, and facing continuous staffing issues and increasing patient acuity. This issue is consistent across the country, in all nursing roles and all sectors. The literature demonstrates convergence with suggestions by nurses participating in this research for change at system, organizational and individual levels to mitigate fatigue and manage fatigue in nursing.

System-Level Recommendations

- 1 Governments at all levels ensure adequate funding aimed at preventing unsafe practices due to rising levels of staff fatigue aggravated by excessive workloads, staff shortages and inattention to safe labour practices. Such funding would support:
 - increasing the number of registered nurses (RNs) to ensure safe care for complex or unstable patients;
 - implementing graduate guarantees to ensure new grads have full-time work (RNAO, 2007b);
 - 70% of full-time nurses in all health organizations so as to foster continuity of care and caregiver, thus increasing quality of care, nurse satisfaction and retention (RNAO, 2005); and
 - other human resources solutions, such as those outlined by CNA to eliminate Canada's RN shortage (CNA, 2009b).
- 2 Governments provide funding to increase nursing enrolments in order to ensure an adequate nursing workforce through made-in-Canada health human resource strategies focused on: expanding the number of qualified faculty in nursing programs, increasing the number of RN seats in education, providing more clinical placement opportunities, and rejecting unethical international recruitment.
- 3 Research groups support new research on the relationship between nurse fatigue and work schedules, adequate rest and recuperation and patient safety, to be carried out in all settings in which nurses work.
- 4 National patient safety and health-care leaders incorporate the issue of nurse fatigue in the national patient safety agenda as a critical factor impacting safe patient care, and the strategy of creating cultures of safety must include mitigating and managing fatigue as a key component.
- 5 Accreditation bodies explore the development of policy standards for health-care organizations that mitigate and manage staff fatigue.
- 6 Nursing associations and nursing unions collaborate to develop consistent advocacy and policy agendas that incorporate fatigue as a factor, at the national, provincial and territorial levels, targeted to governments, health-care organizations and the public. Such agendas focus on creating and sustaining healthy work environments (Griffin et al., 2006) for nurses and providing safe quality care for patients.
- 7 Nursing associations raise awareness about nurse fatigue and its causal factors and consequences related to patient safety, nurse satisfaction, and retention and recruitment at all levels of government, the public and the nursing community. Work with RNAO to develop a best practice guideline related to mitigating and managing fatigue in nursing.
- 8 Nursing regulatory bodies acknowledge issues of nurse fatigue in regulations related to fitness to practise and in management responsibilities for RNs.

Organizational-Level Recommendations

- 1 Health-care organizations promote a culture of safety by establishing a fatigue management policy and program (Quality Worklife-Quality Healthcare Collaborative [QWQHC], 2007, p. 29).
 - Establish scheduling practices and policies for nursing staff (see Appendix C in report).
 - Develop processes to document fatigue in the workplace and its relationship to overtime, maximum hours worked per day and per week, on-call hours, and data related to patient error, staff retention levels and recruitment results.
 - Develop policies that provide time and space for rest periods, meals and other health-promotion initiatives for sleep hygiene.
 - Educate nursing staff and management in recognizing and managing fatigue in self and others, to include understanding the science of sleep, the risks associated with fatigue and approaches to circadian rhythm disturbances.
 - Equip health-care organizations with sleep facilities to enable nurses to minimize their circadian disruptions during evening and night shift work.
- 2 Nursing education programs incorporate, in professional development and clinical courses, information about the impact of fatigue on clinical nursing work, and hours of care on lifestyle and health, and how to manage this aspect of nursing as a career.
- 3 Nursing unions work to mitigate nurse fatigue:
 - Reinforce safe scheduling by limiting hours worked by a nurse (1) in one day to 12 hours, inclusive of shift hand-off, and on-call hours, and (2) in one 7-day period to 48 hours, inclusive of on-call hours.
 - Promote choice of shift type and length for nurses in all health-care settings within a philosophy of continuity of care and caregiver, and create healthy and safe work environments that apply circadian rhythm principles to scheduling.
 - Advocate for review of the extensive use of the 12-hour shift in health-care settings across Canada with a view to introducing a shift length that is more conducive to patient safety and work-life balance.
 - Mount public campaigns about the working conditions of nurses that reflect the issues of workload, hours per day and per week – including on-call and overtime requirements – and the relationship of such issues to patient safety.

Individual-Level Recommendations

Nurses in all roles and practice settings have a professional responsibility to mitigate and manage their own fatigue and provide safe care. They have a professional responsibility to act in a manner that is consistent with maintaining patient and personal safety (CNA, 2008).

- 1 Nurses learn to be aware of, and recognize signs, symptoms and responses to, personal fatigue.
- 2 Nurses understand and work within the policies related to safe patient care within their organizations and within professional practice expectations.
- 3 Nurses take responsibility for mitigating and managing fatigue while at work, including using professional approaches to decline work assignments. When deciding to work extra shifts or when planning work or non-work related activities, nurses act on their ethical obligation to maintain fitness to practice.
- 4 Nurses work through their professional associations, nursing unions and regulatory bodies to advocate for safe patient care through safe scheduling practices in the work environment.
- 5 Nurses support policies, procedures and health promotion initiatives that manage fatigue in the workplace.

The data show that nearly 50% of nurses reported missing 1-10 shifts within the last year due to fatigue, with 7% missing 6-10 shifts. Fatigue was a factor in approximately 25% of the participants who reported considering resigning from their position, and 26% who were considering leaving the profession. Fatigue was reported as not only being due to physical demands of the role (60%), but also to the cognitive and psychosocial demands of the work of nursing (90%), no doubt contributing to the finding that 80% of nurses reported feeling fatigued after their shift either almost always or all the time. While these high levels of fatigue are a risk for patient safety, 95% of nurses generally perceived that they are not committing errors due to fatigue. Several studies in the literature identified that nurses' fatigue was a cause of clinical errors, failure to rescue and falling asleep while driving home. The constant vigilance to prevent errors in self and others is yet another factor contributing to fatigue. Results from nurses in all roles and among all demographic groupings across the country depicted consistently excessive workloads as the key factor contributing to fatigue. Increasingly heavy workloads in nursing can be related to high patient acuity levels, increased patient volumes, and the increased complexity of health care in general, and of nursing interventions in particular.

In spite of the levels of fatigue that nurses experienced due to the work context, 90.4% of nurses indicated that their organization had not developed policies and procedures to address fatigue. These results from Canadian nurses are consistent with the literature describing nurse fatigue, the causes and the high potential for patient safety risks.

Undoubtedly, nurse fatigue is a significant problem that disrupts nurses' physical and mental health, jeopardizes the quality of patient care delivery, and ultimately undermines the quality of the Canadian health-care system. It is a critical issue that must be addressed immediately through attention to a variety of policy decisions at the system, organizational and individual levels. Indeed, all aspects of the health-care system must play a role to stem the dangerous levels of fatigue experienced by nurses as organizations respond to rising patient acuity levels and chronic understaffing through increasing workloads for nurses. Creating healthier work environments and a more "fatigue aware" culture of safety will have a marked impact on reducing and better managing fatigue in nursing work and thus contributing to greater patient safety.

The Canadian Nurses Association and the Registered Nurses' Association of Ontario, in spotlighting this crucial problem and identifying specific solutions, have as their aim to prevent unsafe patient situations and stop a potential exodus from the nursing profession. A continued and fervent focus on nurse fatigue and patient safety is vital in order to prevent any long-lasting effects.

- Admi, H., Tzischinsky, O., Epstein, R., Herer, P., & Lavie, P. (2008). Shift work in nursing: Is it really a risk factor for nurses' health and patients' safety? *Nursing Economics*, 26(4), 250-257.
- Aiken, L. H., Clarke, S. P., Sloane, D. M., & Sochalski, J. A. (2001). An international perspective on hospital nurses' work environments: The case for reform. *Policy, Politics, & Nursing Practice*, 2(4), 255-263.
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J. A., Busse, R., Clarke, H., et al. (2001). Nurses' reports on hospital care in five countries. *Health Affairs*, 20(3), 43-53.
- American Nurses Association. (2000). ANA head says overtime puts patients at risk. *Healthcare Risk Management*, 22(6), 66-67.
- American Nurses Association. (2006a, December). *Assuring patient safety: Registered nurses' responsibility in all roles and settings to guard against working when fatigued* [Position statement]. Washington, DC: Author. Retrieved March 13, 2010, from <http://www.nursingworld.org/assurringsafetynurseps>
- American Nurses Association. (2006b, December). *Assuring patient safety: The employers' role in promoting healthy nursing work hours for registered nurses in all roles and settings* [Position statement]. Washington, DC: Author. Retrieved March 13, 2010, from <http://www.nursingworld.org/assurringsafetyemployerps>
- Association of Registered Nurses of Newfoundland and Labrador. (2008). *Juggling overtime and fatigue: Shared responsibilities*. St. John's, NL: Author. Retrieved March 7, 2010, from http://www.arnnl.nf.ca/documents/pages/Juggling_Overtime_and_Fatigue_Shared_Professional_Responsibilities_08.pdf
- Association of Registered Nurses of Prince Edward Island. (2009). *Working extra hours: Fitness to practice/duty of care* [Position statement]. Charlottetown, PE: Author. Retrieved March 7, 2010, from <http://www.arnpei.ca/default.asp?id=190&pagesize=1&sfield=content.id&search=99&mn=1.45>
- Balas, M. C., Casey, C. M., Scott, L. D., & Rogers, A. E. (2008). Maintain vigilance in the ICU: How do work hours and sleep affect patient care? *Nursing Management* 39(4), 32A, 32B, 32D, 32F.
- Banerjee, L. (2003). Overtime and fatigue. *SRNA Newsbulletin*, 5(2), 9.
- Barton, J., Spelten, E., Totterdell, P., Smith, L., Folkard, S., & Costa, G. (1995). The Standard Shiftwork Index: A battery of questionnaires for assessing shiftwork-related problems. *Work and Stress*, 9(1), 4-30.
- Berland, A., Natvig, G. K., & Gundersen, D. (2008). Patient safety and job-related stress: A focus group study. *Intensive and Critical Care Nursing*, 24(2), 90-97.
- Beyea, S. C. (2004). Too tired to work safely? *AORN Journal*, 80(3), 559-562.
- Bodin, S. (2008). Keeping individuals with kidney disease safe: Raising awareness of the effects of nurse fatigue [President's message]. *Nephrology Nursing Journal*, 35(2), 115-116.
- Brugne, J. F. (1994). Effects of night work on circadian rhythms and sleep. *Professional Nurse*, 10(1), 25-28.
- Cady, R. F. (2008). Refusal to care. *JONA's Healthcare Law, Ethics, and Regulation*, 10(2), 42-47.
- Canadian Nurses Association. (2005). Nursing staff mix: A key link to patient safety. *Nursing Now: Issues and Trends in Canadian Nursing*, no. 19. Ottawa: Author. Retrieved March 13, 2010, from http://www.cna-aiic.ca/CNA/documents/pdf/publications/NN_Nursing_Staff_Mix_05_e.pdf

Canadian Nurses Association. (2006a). Annual meetings: CNA resolutions 2006. Resolution 4: Patient safety and nursing fatigue. Saskatchewan Registered Nurses Association. Retrieved March 13, 2010, from http://www.cna-aicc.ca/CNA/about/meetings/resolutions_2006/resolutions_04_e.aspx

Canadian Nurses Association. (2006b). *National planning for human resources in the health sector* [Position statement]. Ottawa: Author. Retrieved March 13, 2010, from http://www.cna-aicc.ca/CNA/documents/pdf/publications/PS81_National_Planning_e.pdf

Canadian Nurses Association. (2008). *Code of ethics for registered nurses*. Ottawa: Author.

Canadian Nurses Association. (2009a). *Patient safety* [Position statement]. Ottawa: Author. Retrieved March 13, 2010, from http://www.cna-aicc.ca/CNA/documents/pdf/publications/PS102_Patient_Safety_e.pdf

Canadian Nurses Association. (2009b). *Tested solutions for eliminating Canada's registered nurse shortage*. Ottawa: Author.

Canadian Nurses Association. (n.d.). *Practice environments and patient safety*. Retrieved March 13, 2010, from http://www.cna-aicc.ca/CNA/practice/environment/default_e.aspx

Canadian Nurses Association & Registered Nurses' Association of Ontario. (2009). *Literature review report on nurse fatigue and patient safety*. [Unpublished]. Ottawa & Toronto: Authors.

Carlton, G., & Blegen, M. A. (2006). Medication-related errors: A literature review of incidence and antecedents. *Annual Review of Nursing Research*, 24, 19-38.

College and Association of Registered Nurses of Alberta. (2006). *Working extra hours: Guidelines for registered nurses on fitness to practise and the provision of safe, competent, ethical nursing care*. Edmonton: Author. Retrieved March 7, 2010, from <https://www.nurses.ab.ca/Carna-Admin/Uploads/Working%20Extra%20Hours.pdf>.

Dawson, D., & Fletcher, A. (2001). A quantitative model of work-related fatigue: Background and definition. *Ergonomics*, 44(2), 144-163.

Dean, G. E., Scott, L. D., & Rogers, A. E. (2006). Infants at risk: When nurse fatigue jeopardizes quality care. *Advances in Neonatal Care*, 6(3), 120-126.

Deans, C. (2005). Medication errors and professional practice of registered nurses. *Collegian*, 12(1), 29-33.

Dorrian, J., Lamond, N., van den Heuvel, C., Pincombe, J., Rogers, A. E., & Dawson, D. (2006). A pilot study of the safety implications of Australian nurses' sleep and work hours. *Chronobiology International*, 23(6), 1149-1163.

Dorrian, J., Tolley, C., Lamond, N., van den Heuvel, C., Pincombe, J., Rogers, A. E., & Dawson, D. (2008). Sleep and errors in a group of Australian hospital nurses at work and during the commute. *Applied Ergonomics*, 39(5), 605-613.

Ekstedt, M., & Fagerberg, I. (2005). Lived experiences of the time preceding burnout. *Journal of Advanced Nursing*, 49(1), 59-67.

Ellis, J. R. (2008). *Quality of care, nurses' work schedules, and fatigue: A white paper*. Seattle: Washington State Nurses Association.

Ellis, J., Priest, A., MacPhee, M., & Sanchez McCutcheon, A., on behalf of CHSRF and partners. (2006). *Staffing for safety: A synthesis of the evidence on nurse staffing and patient safety*. Ottawa: Canadian Health Services Research Foundation. Retrieved March 13, 2010, from http://www.chsrf.ca/research_themes/pdf/staffing_for_safety_policy_synth_e.pdf

- Flin, R., Yule, S., McKenzie, L., Paterson-Brown, S., & Maran, N. (2006). Attitudes to teamwork and safety in the operating theatre. *Surgeon, 4*(3), 145-151.
- Gaffney, T. (2007). Take a nap? *Virginia Nurses Today, 15*(2), 17.
- Glaus, A. (1998). *Fatigue in patients with cancer: Analysis and assessment*. Heidelberg, Germany: Springer-Verlag Berlin.
- Grant, M. C., Donaldson, A. E., & Larsen, G. Y. (2006). The safety culture in a children's hospital. *Journal of Nursing Care Quality, 21*(3), 223-229.
- Griffin, P., El-Jardali, F., Tucker, D., Grinspun, D., Bajnok, I., & Shamian, J. (2006). "Conceptual model for healthy work environments for nurses – Components, factors & outcomes." In *Developing and sustaining nursing leadership* [Healthy work environments best practice guidelines] (pp. 12-15). Toronto: Registered Nurses' Association of Ontario.
- Grinspun, D., Virani, T., & Bajnok, I. (2001/2002). Nursing best practice guidelines: The RNAO (Registered Nurses Association of Ontario) project. *Hospital Quarterly, 5*(2), 56-60.
- Grogan, E. L., Stiles, R. A., France, D. J., Speroff, T., Morris, J. A., Nixon, B., et al. (2004). The impact of aviation-based teamwork training on the attitudes of health-care professionals. *Journal of the American College of Surgery, 199*(6), 843-848.
- Hemme Froslic, E. (2007). How to nurse a fatigued mind. *Prairie Rose, 76*(1), 20.
- Hinshaw, A. S. (2006). Keeping patients safe: A collaboration among nurse administrators and researchers. *Nursing Administration Quarterly, 30*(4), 309-320.
- Hughes, R. G., & Rogers, A. E. (2004). Are you tired?: Sleep deprivation compromises nurses' health – and jeopardizes patients. *American Journal of Nursing, 104*(3), 36-38.
- International Council of Nurses. (2009). *Nurses and overtime* [Nursing Matters fact sheet]. Geneva: Author. Retrieved March 14, 2010, from http://www.icn.ch/matters_overtime.htm
- Johnson, J. (2008). The increased incidence of anesthetic adverse events in late afternoon surgeries. *AORN Journal, 88*(1), 79-87.
- Kenyon, T. A., Gluesing, R. E., White, K. Y., Dunkel, W. L., & Burlingame, B. L. (2007). On call: Alert or unsafe? A report of the AORN on-call electronic task force. *AORN Journal, 86*(4), 630-639.
- Kudo, Y., Satoh, T., Kido, S., Watanabe, M., Miki, T., Miyajima, E., et al. (2008). A pilot study testing the dimensions of safety climate among Japanese nurses. *Industrial Health, 46*(2), 158-165.
- La Pine, M. P., Malcomson, F. M., Torrance, J. N., & Marsh, N. V. (2006). Night shift: Can a homeopathic remedy alleviate shift lag? *Dimensions of Critical Care Nursing, 25*(3), 130-136.
- Lyndon, A. (2007). *Agency for safety in perinatal nursing practice* [PhD dissertation]. San Francisco: University of California. (UMI no. 3261236).
- Marjanovic, Z., Greenglass, E. R., & Coffey, S. (2007). The relevance of psychosocial variables and working conditions in predicting nurses' coping strategies during the SARS crisis: An online questionnaire survey. *International Journal of Nursing Studies, 44*(6), 991-998.
- Mayo, A. M., & Duncan, D. (2004). Nurse perceptions of medication errors: What we need to know for patient safety. *Journal of Nursing Care Quality, 19*(3), 209-217.
- McClelland, L. E. (2007). *Examining the effects of fatigue on decision-making in nursing: A policy capturing approach* [PhD dissertation]. Clemson, SC: Clemson University. (UMI no. 3290711).

- Montgomery, V. L. (2007). Effect of fatigue, workload, and environment on patient safety in the pediatric intensive care unit. *Pediatric Critical Care Medicine*, 8(2), S11-S16.
- National Association of Neonatal Nurses. (2008). *Bedside registered staff nurse shift length, fatigue, and impact on patient safety* [Position statement]. Glenview, IL: Author. Retrieved March 14, 2010, from <http://www.nann.org/pdf/08fatigue.pdf>
- North American Nursing Diagnosis Association. (1996). *Nursing diagnoses: Definitions and classification, 1997-1998*. Philadelphia, PA: Author.
- Nurses Association of New Brunswick & New Brunswick Nurses Union. (2007). *Working understaffed: Professional and legal considerations*. Fredericton: Authors. Retrieved March 14, 2010, from <http://www.nanb.nb.ca/PDF/practice/Working%20Understaffed%20Brochure.pdf>
- Piper, B. F., Lindsey, A. M., & Dodd, M. J. (1987). Fatigue mechanisms in cancer patients: Developing nursing theory. *Oncology Nursing Forum*, 14(6), 17-23.
- Quality Worklife-Quality Healthcare Collaborative. (2007). *Within our grasp: A healthy workplace action strategy for success and sustainability in Canada's healthcare system*. Ottawa: Canadian Council on Health Services Accreditation. Retrieved March 14, 2010, from http://www.cna-aiic.ca/CNA/documents/pdf/publications/2007_QWQHC_Within_Our_Grasp_e.pdf
- Ream, E., & Richardson, A. (1996). Fatigue: A concept analysis. *International Journal of Nursing Studies*, 33(5), 519-529.
- Registered Nurses' Association of Ontario. (2004). *Policy statement on patient safety*. Toronto: Author. Retrieved March 14, 2010, from http://www.rnao.org/Storage/38/3297_Policy_Statement_on_Patient_Safety.pdf
- Registered Nurses' Association of Ontario. (2005). *The 70 per cent solution: A progress report on increasing full-time employment for Ontario RNs*. Toronto: Author.
- Registered Nurses' Association of Ontario. (2007a). *Developing and sustaining effective staffing and workload practices*. Toronto: Author.
- Registered Nurses' Association of Ontario. (2007b). New graduate full-time guarantee and 80/20 go hand-in-hand [President's view]. *Registered Nurse Journal*, March/April. Retrieved March 15, 2010, from <http://www.rnao.org/Page.asp?PageID=122&ContentID=1840&SiteNodeID=422>
- Registered Nurses' Association of Ontario. (2009). *Briefing note: Strengthening the nursing workforce for a stronger health care system*. Toronto: Author. Retrieved March 14, 2010, from http://www.rnao.org/Storage/53/4793_Briefing_note_-_strengthening_nursing_2009.pdf
- Rogers, A. E. (2008). The effects of fatigue and sleepiness on nurse performance and patient safety. In *Patient safety and quality: An evidence-based handbook for nurses*. AHRQ publication no. 08-0043. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved March 7, 2010, from <http://www.ahrq.gov/qual/nurseshdbk/>
- Rogers, A. E., Hwang, W. T., Scott, L. D., Aiken, L. H., & Dinges, D. F. (2004). The working hours of hospital staff nurses and patient safety. *Health Affairs*, 23(4), 202-212.
- Ross, J. (2008). Fatigue: Do you understand the risks to safety? *Journal of PeriAnesthesia Nursing*, 23(1), 57-59.
- Ruggiero, J. (2002). *Correlates of fatigue in critical care nurses* [PhD dissertation]. Newark, NJ: Rutgers, the State University of New Jersey. (UMI no. 3043635).

- Saskatchewan Registered Nurses' Association. (2009). *A SRNA discussion paper on hours of work, fatigue and patient safety*. Regina, SK: Author.
- Scarrow, J. (2008). Revolutionizing nursing practice. *Registered Nurse Journal*, March/April, 12-17.
- Schaffner, M. J. (2006). *Antecedents and consequences of work-related nurse fatigue: A preliminary evidence-based model* [PhD dissertation]. Charleston, SC: Medical University of South Carolina. (UMI no. 3254253).
- Scott, D. E. (2008). Surviving shift work. *Vermont Nurse Connection*, 11(1), 9.
- Scott, L. D., Rogers, A. E., Hwang, W. T., & Zhang, Y. (2006). Effects of critical care nurses' work hours on vigilance and patients' safety. *American Journal of Critical Care*, 15(1), 30-37.
- Slavin, K. (2007). Environment, health, and safety: ANA addresses shift work. *American Nurse Today*, 3(8), 30.
- Stewart, A. L., Hays, R. D., & Ware, J. E. (1992). Health perceptions, energy/fatigue, and health distress measures. In A. L. Stewart & J. E. Ware (Eds.), *Measuring functional status and well-being: The medical outcomes study approach* (pp. 143-172). Durham, NC: Duke University Press.
- Stone, P. W., Yunling, D., Cowell, R., Amsterdam, N., Helfrich, T. A., Linn, R. W., et al. (2006). Comparison of nurse, system and quality patient care outcomes in 8-hour and 12-hour shifts. *Medical Care*, 44(12), 1099-1106.
- Sullivan, E. E. (2007). Keeping our nurses and patients safe. *Journal of PeriAnesthesia Nursing*, 22(6), 420-422.
- Suzuki, K., Ohida, T., Kaneita, Y., Yokoyama E., Miyake, S., Harano, S., et al. (2004). Mental health status, shift work, and occupational accidents among hospital nurses in Japan. *Journal of Occupational Health*, 46(6), 448-454.
- Trossman, S. (2007). Too tired to be safe? ANA position statements call for RNs and employers to prevent working fatigued. *American Nurse Today*, 2(4), 35-36.
- Ulrich, B. T., Buerhaus, P. I., Donelan, K., Norman, L., & Dittus, R. (2005). How RNs view the work environment: Results of a national survey of registered nurses. *Journal of Nursing Administration*, 35(9), 389-396.
- Wagner, L. I., & Jason, L. A. (1997). Outcomes of occupational stressors on nurses: Chronic fatigue syndrome-related symptoms. *Nursingconnections*, 10(3), 41-49.
- Warrington, G. (2009). Compartment syndrome: A case of increased pressure. *Nursing BC*, 41(1), 27-28.
- Windle, P. E., Mamaril, M., & Fossum, S. (2008). Perianesthesia nursing advocacy: An influential voice for patient safety. *Journal of PeriAnesthesia Nursing*, 23(3), 163-171.
- Wisconsin Nurses Association. (2007). WNA and Wisconsin Nursing Coalition issue working draft on nurse fatigue and patient safety research and recommendations. *STAT Bulletin*, 76(7), 3-4.
- Zboril-Benson, L. R. (2002). Why nurses are calling in sick: The impact of health-care restructuring. *Canadian Journal of Nursing Research*, 33(4), 89-107.

National Advisory Committee

Co-Chair: Lisa Ashley RN MEd, CCHN(C)
Nurse Consultant, Nursing Policy
Canadian Nurses Association

Co-Chair: Irmajean Bajnok RN, MScN, PhD
Director, International Affairs and Best Practice Guidelines Programs
Co-Director, Nursing Best Practice Research Unit
Registered Nurses' Association of Ontario

Linda Banerjee RN, BScN, BSChE
Nursing Practice Advisor
Saskatchewan Registered Nurses' Association

Shauna Figler RN, BN, CHE
Nursing Practice Consultant
Nurses Association of New Brunswick

Doris Grinspun RN, MSN, PhD (c), O.ONT
Executive Director
Registered Nurses' Association of Ontario

Janet Helmer RN(EC), MEd
Eastern Regional Anglophone Coordinator
Ontario Primary Health Care Nurse Practitioner Education Program

Catherine Hodgins
Canadian Patient Safety Institute

Sandra MacDonald-Rencz RN, MEd, CHE
Executive Director, Office of Nursing Policy
Strategic Policy Branch, Health Canada

Linda McGillis Hall Ph.D., FAAN
Professor and Associate Dean of Research and External Relations
MOHLTC Nursing Senior Career Research Award
Lawrence S. Bloomberg Faculty of Nursing
University of Toronto

Debra McPherson
Canadian Federation of Nurses Unions

Conceptual Model for Healthy Work Environments for Nurses

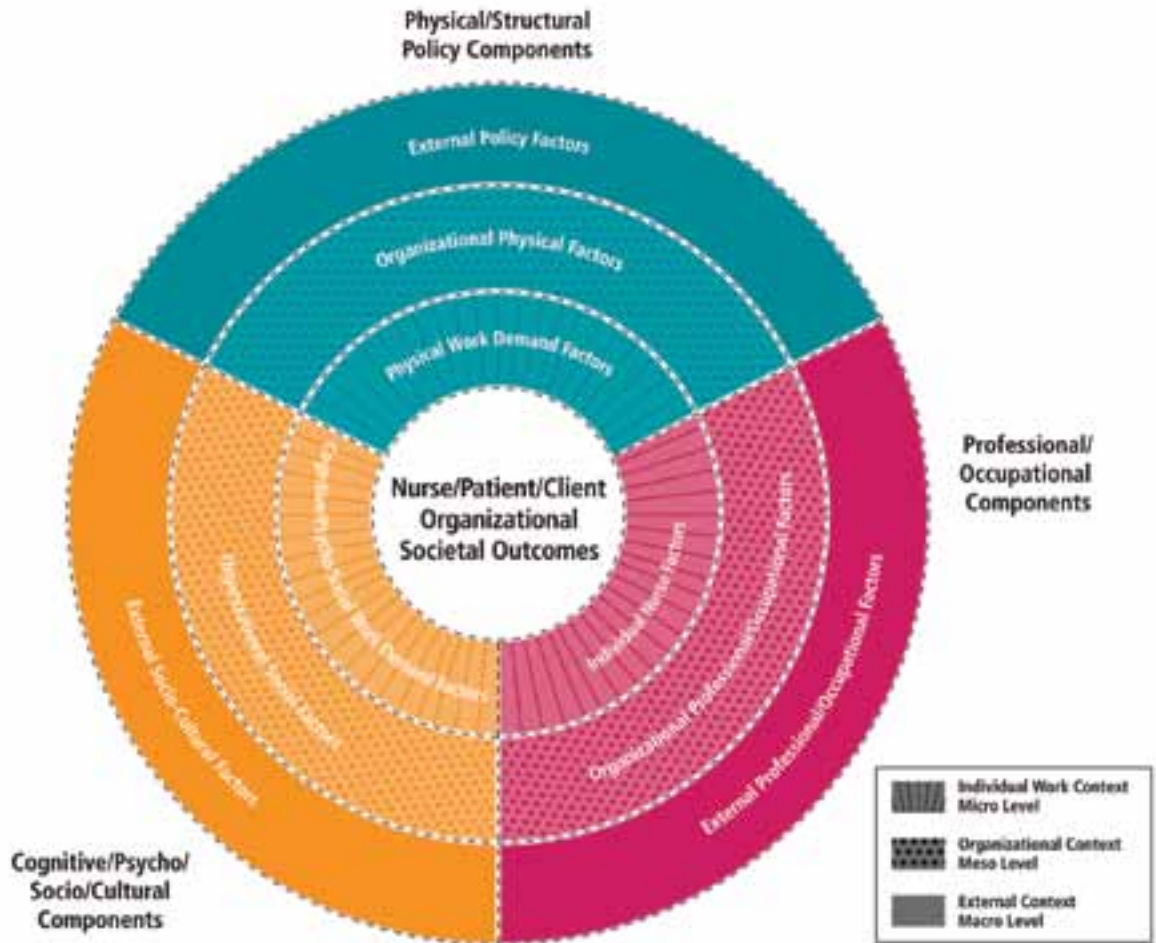


Figure 1. Conceptual Model for Healthy Work Environments for Nurses – Components, Factors & Outcomes³⁻¹¹

A healthy work environment for nurses is complex and multidimensional, comprised of numerous components and relationships among the components. A comprehensive model is needed to guide the development, implementation and evaluation of a systematic approach to enhancing the work environment of nurses. Healthy work environments for nurses are defined as practice settings that maximize the health and well-being of the nurse, quality patient/client outcomes, organizational performance and societal outcomes.

The Comprehensive Conceptual Model for Healthy Work Environments for Nurses presents the healthy workplace as a product of the interdependence among individual (micro level), organizational (meso level) and external (macro level) system determinants as shown above in the three outer circles. At the core of the circles are the expected beneficiaries of healthy work environments for nurses – nurses, patients, organizations and systems, and society as a whole, including healthier communities.^{iv} The lines within the model are dotted to indicate the synergistic interactions among all levels and components of the model.

The model suggests that the individual's functioning is mediated and influenced by interactions between the individual and his/her environment. Thus, interventions to promote healthy work environments must be aimed at multiple levels and components of the system. Similarly, interventions must influence not only the factors within the system and the interactions among these factors but also influence the system itself.^{vii}

The assumptions underlying the model are as follows:

- healthy healthy work environments are essential for quality, safe patient care;
- the the model is applicable to all practice settings and all domains of nursing;
- individual, organizational and external system level factors are the determinants of healthy work environments for nurses;
- factors at all three levels impact the health and well-being of nurses, quality patient outcomes, organizational and system performance, and societal outcomes either individually or through synergistic interactions;
- at each level, there are physical/structural policy components, cognitive/psycho/social/cultural components and professional/occupational components; and
- the professional/occupational factors are unique to each profession, while the remaining factors are generic for all professions/occupations.

i Adapted from DeJoy, D.M. & Southern, D.J. (1993). An Integrative perspective on work-site health promotion. *Journal of Medicine*, 35(12): December, 1221-1230; modified by Lashinger, MacDonald and Shamian (2001); and further modified by Griffin, El-Jardali, Tucker, Grinspun, Bajnok, & Shamian (2003)

ii Baumann, A., O'Brien-Pallas, L., Armstrong-Stassen, M., Blythe, J., Bourbonnais, R., Cameron, S., Irvine Doran D., et al. (2001, June). *Commitment and care: The benefits of a healthy workplace for nurses, their patients, and the system*. Ottawa, Canada: Canadian Health Services Research Foundation and The Challenge Foundation.

iii O'Brien-Pallas, L., & Baumann, A. (1992). Quality of nursing worklife issues: A unifying framework. *Canadian Journal of Nursing Administration*, 5(2):12-16.

iv Hancock, T. (2000). The Healthy Communities vs. "Health". *Canadian Health Care Management*, 100(2):21-23.

v Green, L.W., Richard, L. and Potvin, L. (1996). Ecological foundation of health promotion. *American Journal of Health Promotion*, 10(4): March/April, 270-281

vi Grinspun, D., (2000). *Taking care of the bottom line: shifting paradigms in hospital management*. In Diana L. Gustafson (ed.), *Care and Consequence: Health Care Reform and Its Impact on Canadian Women*. Halifax, Nova Scotia, Canada. Fernwood Publishing.



Figure 1A

Physical/Structural Policy Components

- At the individual level, the Physical Work Demand Factors include the requirements of the work which necessitate physical capabilities and effort on the part of the individual.¹⁴ Included among these factors are workload, changing schedules and shifts, heavy lifting, exposure to hazardous and infectious substances, and threats to personal safety.
- At the organizational level, the Organizational Physical Factors include the physical characteristics and the physical environment of the organization and also the organizational structures and processes created to respond to the physical demands of the work. Included among these factors are staffing practices, flexible, and self-scheduling, access to functioning lifting equipment, occupational health and safety policies, and security personnel.
- At the system or external level, the External Policy Factors include health care delivery models, funding, and legislative, trade, economic and political frameworks (e.g., migration policies, health system reform) external to the organization.

Cognitive/Psycho/Socio/Cultural Components



Figure 1B

Cognitive/Psycho/Socio/Cultural Components

- At the individual level, the Cognitive and Psycho-social Work Demand Factors include the requirements of the work which necessitate cognitive, psychological and social capabilities and effort (e.g., clinical knowledge, effective coping skills, communication skills) on the part of the individual.⁴⁰ Included among these factors are clinical complexity, job security, team relationships, emotional demands, role clarity, and role strain.
- At the organizational level, the Organizational Social Factors are related to organizational climate, culture, and values. Included among these factors are organizational stability, communication practices and structures, labour/management relations, and a culture of continuous learning and support.
- At the system level, the External Socio-cultural Factors include consumer trends, changing care preferences, changing roles of the family, diversity of the population and providers, and changing demographics – all of which influence how organizations and individuals operate.

Professional/Occupational Components



Figure 1C

Professional/Occupational Components

- At the individual level, the Individual Nurse Factors include the personal attributes and/or acquired skills and knowledge of the nurse which determine how she/he responds to the physical, cognitive and psycho-social demands of work.⁴⁰ Included among these factors are commitment to patient care, the organization and the profession; personal values and ethics; reflective practice; resilience, adaptability and self confidence; and familywork/life balance.
- At the organizational level, the Organizational Profession/Occupational Factors are characteristic of the nature and role of the professional/occupation. Included among these factors are the scope of practice, level of autonomy and control over practice, and intradisciplinary relationships.
- At the system or external level, the External Professional/Occupational Factors include policies and regulations at the provincial/territorial, national and international level which influence health and social policy and role socialization within and across disciplines and domains.

Scheduling Practices and Policies That Mitigate Fatigue

Scheduling practices and policies for nursing that mitigate fatigue include:

- Promote flexibility regarding choice of shift type and length for nurses in all health-care settings within a philosophy of continuity of care and caregiver.
- Ensure that nurses do not work more than 12 hours in a 24-hour period, and no more than 48 hours in a 7-day period.
- Allow shift rotations to be scheduled every one or two weeks to allow for adaptation of circadian rhythm.
- Limit the number of on-call shifts assigned in a 7-day period to depend on the type of facility, and coordinate hours with the number of sustained work hours and adequate recuperation periods.
- Allow sufficient time for safe patient handoff to be carried out within the regular paid shift hours, and preferably face-to-face.
- Establish work schedules so that off-duty periods include an uninterrupted 8-hour sleep cycle, a break from continuous professional responsibilities, and time to perform individual activities of daily living.

