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Lifestyles, Work, and Health of U.S. Hospital Nurses

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Lifestyles, Work, and Health of U.S. Hospital Nurses

by

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DISSERTATION

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DOCTOR OF PHILOSOPHY

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[redacted]

Dedication

Two women and two men—

The woman who came before me and the woman who came after me—

My daughter, Sarah Hannah Rose—

Two men who became fathers: both hers and mine.

Continuing the circle of life.

Acknowledgements

Becoming is a process that requires each of us holding out our hands and the opening of our hearts in acceptance as we go forth. The human potential knows no bounds when we join together to create a common goal. With this in mind, I extend my deepest gratitude to those who gave me permission and supported me along this journey of discovery through my education at UCSF. First and foremost, I acknowledge Catherine Waters, RN, PhD for inviting me to begin the journey at UCSF; whose patience, tolerance, and belief in me was a source of infinite encouragement. Essential for the completion of this journey, Oi Saeng Hong, RN PhD, who graciously took the baton, and who holds a special place in my heart after kindly "adopting" me and guiding me along a clear path to graduation. Grace also goes to Dr. Jyu-Lin Chen, an educator extraordinaire, who successfully took my qualitative brain and fixed me it to a quantitative grid, helping me create a systematic review, preparing me for the qualifying exams and acting as my committee chair. And to Dr. Carol Dawson- Rose, who graciously joined the committee and stayed onboard through all the bumps and stalls of this journey. A special thanks goes to Steve Paul PhD who opened his Disneyland door to me by offering personal statistic training. Finally, I have a much gratitude for the essential help of editors who were also educators, Karen Borst-Roth and Bruce Smith.

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This particular study would not have been possible without the American Nurses' Association HealthyNurse™ health risk appraisal and permission to use their survey data. I appreciate their support for my work and their shared vision of nurses' modeling health. Finally, Sigma Theta Tau, Alpha Eta Chapter sponsorship of my research is greatly appreciated.

Lifestyles, Work and Health of U.S. Hospital Nurses

Susan M. Priano

Abstract

Background

Unhealthy lifestyles contribute to greater than half than of the premature deaths in the US. With fewer than 5% of nurses practicing healthy lifestyles and hospitals one of the most hazardous workplaces, nurses' health and safety are at risk.

Purpose

To examine the lifestyle behaviors, health, and hospital workplace environment of U.S. registered nurses (RNs).

Methods

A cross-sectional descriptive design was used to analyze data from the American Nurses Association HealthyNurse online health risk appraisal from October 2013 to December 2015 with a convenience sample of 2,730 U.S. hospital nurses. Social and work demographics, lifestyle and health measures included: dietary fruit and vegetable consumption (5 servings/day), physical activity (150 min./week of moderate to vigorous intensity), not smoking, moderate alcohol, sleep (7-8 hours), perceived health (self-rated, role limitations, mental & emotional) and actual diagnoses. Workplace measures were: climate, risks, sharps, safe patient handling and mobility, bullying/violence, fatigue, workplace wellness, absent/present.

Results

Sample nurses (female [92%], age [40.0M], White [75%], BSN/ASN [45%/31%] experience 42% < 5 years) had a healthy diet (14%), adequate sleep (53%) and physical activity (45% - 47%), not smoking (94%), and moderate alcohol use (93%). Self-rated health was very

good or excellent (47%); role limited by pain, physical, or mental health (averaged 3 of 14 days), mental health for fatigue (5 of 14 days). Actual health: allergies 29.1%, low back pain 21.8%, migraines 17.9%, depression 17.8%; and weight with BMI $\leq$ 25 kg/m^2 42.9%.

Key work findings: risks of workplace stress (80%), musculoskeletal strain (60%), and hospital-acquired infections (45%); few nurses (26% and 34%) were involved safety technology selection; 75% favorable employer perceptions. Bullying experienced by: persons in authority (42%), peers (56%), patients or family (56%). Nurses' work: dayshift (58%), 12-hour shifts (52%), overtime (41%), unplanned overtime (67%), > 50% felt obligated to work when ill.

Conclusions

Nurse challenges in practicing healthy lifestyles are compounded by the hospital workplace environment.

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Chapter 1.

Introduction

Chapter 1

Lifestyles, Work, and Health of U.S. Hospital Nurses

Nurses, numbering 4.1 million nationwide, comprise the largest segment of healthcare workers in the US, in which of those 63% are employed in hospitals (Budden, Zhong, Moulton, & Cimiotti, 2013; Bureau of Labor Statistics [BLS], U.S. Department of Labor, 2015; Health Resources and Services Administration, 2013). Yet, the hospital environment is considered one of the most hazardous workplaces with 6.8 work-related injuries and illnesses for every 100 full-time employees, twice the rate of private industry, putting nurses' health at risk (Occupational Health and Safety Administration, OSHA, 2011). Collectively, nurses are the most vulnerable for multiple workplace safety hazards due to the hospital workplace environment (BLS, 2015).

A remedy in part to buffer the hazards of the hospital work environment may be to support nurses' healthy lifestyle practices of consuming a healthy diet, staying physically active, moderating alcohol use, not smoking, and getting enough sleep (Blake & Harrison, 2013; Carlson & Warne, 2006; Gillen, 2014; Geiger-Brown et al., 2004; Letvak, Ruhm, & Gupta, 2012). In fact, by recognizing the socioecology of health, the work environment is an important factor in supporting nurses' healthy lifestyle practices (Green, Richard, & Potvin, 1996). Indeed, a healthy nursing workforce has broad implications for nurses' health, patients' health, and consequently a healthy nation.

Background and Significance

Optimal health is possible when social and environmental conditions align to support the health of the individual and the community (Dunn, 1959; World Health Organization, 1986). Population health studies have investigated the socio-ecologic conditions necessary for maintaining a healthy community. One of the earliest of these, the Alameda County Study,

identified seven key lifestyle factors that contribute to health: never having smoked, drinking less than five alcoholic drinks in one sitting, sleeping 7–8 hours a night, exercising, maintaining a desirable weight for height, avoiding snacks, and eating breakfast regularly (Housman & Dorman, 2005). In addition, the Whitehall study examining civil servants found a relationship between the social strata rank and mortality rates, citing positive correlations between better health and higher social-economic status (Marmot, 1994). Both landmark studies are important for understanding the impact of the social and physical environmental factors' affects on health.

Health

Today, the most widely accepted definition of health is, "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity," (World Health Organization [WHO], 1948). In addition, the Declaration of Alma Ata formulated that health was a fundamental human right (International Conference on Primary Health Care, 1978). The US perspective followed with the Surgeon General's 1979 report launching the Healthy Peoples Initiative, which set forth a series of decades-long science-based goals and objectives to prevent disease and promote health using leading health indicators to identify our Nations' health concerns. Globally, the concept of *Health for All,* defined by the WHO Ottawa Charter for Health Promotion, acknowledged the social determinants of health as a factor in obtaining optimal health (Canadian Public Health Association, Health and Welfare of Canada, & The World Health Organization, 1986). Health was noted to be a positive concept, encompassing the social, personal, and physical resources of people and groups and health promotion as "the process of enabling people to increase control over and to improve their health," extending beyond personal lifestyles to encompass wellbeing (WHO, 2009, p.1). Currently, U.S. national surveys such as the Behavioral Risk Factor Surveillance System (BRFSS), the National Health

Interview Survey (NHIS) and the *National Health and Nutrition Examination Survey* (NHANES) measure the nation's health risk behaviors, clinical preventive practices, health care access and use to determine the state of the nation's health.

Measuring Health

Health history. Although health has been defined holistically, in reality healthcare providers continue to treat health from an illness perspective with preventive care offered as a means of screening for disease and immunizations. At the doctor's office a person's health is typically measured by taking a health history, which includes an overview of the body systems, the family history of disease, a social history that includes smoking but rarely addresses environmental or social factors that inhibit or support health. The routine health history concludes with a list of problems, or most prevalent illnesses such as cardiovascular diseases, cancer, and diabetes (National Institutes of Health, 2016). However, healthcare practitioners are shifting their perspective to understand health from the patient's perspective.

Health risk appraisals (HRA) were devised in the mid-20th century as actuarial tools (i.e., for estimating lifespan) for people at risk for early death and estimated individual lifestyle habits as a risk of developing chronic health conditions. The HRA instrument has three components: a questionnaire, risk-projection calculations, and an educational message or report. U.S. employers, responsible for providing workers health insurance, used health risk assessments to keep workers healthy and health care costs manageable. However, HRA instruments did not become popular until the 1980s, when the Centers for Disease Control and Prevention (CDC) began to use these tools in an electronic format. It was the Patient Protection and Affordable Care Act of 2010 (ACA), Section 4103 that was most responsible for an increase in the use of health risk assessment tools; mandating that Medicare must cover, without cost to beneficiaries,

an annual wellness visit that includes a health risk assessment followed by provision of a customized wellness or personal prevention (Koh & Sebelius, 2010). The policy mandates of the ACA paved the way for workplace wellness centers that utilize HRAs. In this study, the American Nurses' Association (ANA) HealthyNurse is an HRA that examines nurses' social and employment demographics, nurses' lifestyles, perceived and actual (history) health, and the workplace environment.

Perceived health. The concept of health viewed from the perspective of the individual, as ones' quality of life, became necessary as advances in public health and medicine resulted in people living longer with chronic disease or disability. The health and insurance industry began employing a tool able to measure a person's overall condition of life. The most popular, the RAND Medical Outcomes Survey (MOS) Short Form 36 (SF-36), assessed different aspects of physical and mental health including role function, pain, depression and emotional support (Ware & Sherbourne, 1992). Included in the MOS survey was a single global measure of one's psychosocial and physical health referred to as self-rated health. The single self-rated health question, "*In general, your health is…?"* has been used with good or better reliability in comparison with tools that measure functional ability, chronic diseases, and well-being (Lundberg & Manderbacka 2001). The ANA HRA surveys nurses' perceived health inclusive of self-rated health, role limitations, mental health, and adequate emotional support.

Healthy Lifestyles

Recommendations for healthy lifestyle practices have been issued by the U.S. Department of Agriculture (U.S. DA) and the U.S. Department of Health and Human Services (U.S. DHHS), which include being physically active and eating a healthy diet to promote good health and reduce the risk of chronic diseases (2008, 2015). The recommendations support

evidence that most health benefits occur with at least 150 minutes per week of moderate intensity physical activity, and dietary habits of consuming a variety of vegetables and fruits per day, grains (whole), fat or low fat dairy products, a variety of protein foods, oils, and the avoidance of saturated and trans fats, sugar and salt laden foods and drink (U.S. HHS, 2015; U.S. DA & U.S. HHS, 2008). Healthy lifestyle practices also include abstinence from smoking, a moderate use of alcohol (defined as one serving per day), and adequate sleep of at least 7-9 hours per night for adults (Hirshkowitz et al., 2015). In sum, the prevalence of morbidity and mortality have been shown to be decreased when people are able to adhere to modifiable, preventable lifestyle behaviors such as not smoking, eating a balanced healthy diet, and engaging in the recommended levels of physical activity (Mokdad, Marks, Stroup, & Gerberding, 2004).

Nurses' healthy lifestyles. Nurses, as providers and facilitators of healthcare, possess specialized knowledge about health and wellness. The ANA (2010) scope of practice charges nurses to be responsible for not only supporting health but to promote public health. In fact, nurses are taught to engage in self–care in order to care for others (American Association of Colleges of Nursing, 2008). In addition, the Institute for Medicine, in its *Future of Nursing* (2011) recommends nurses should maintain healthy lifestyles and to apply their nursing knowledge as an action to improve public health (Strout, 2012).

Invariably, nurses may not be applying their knowledge to protect and maintain *their own* health. Research from the Nurses' Health Study, the longest running study and largest aggregate of data on nurses' health, found that only 3% of nurses adhere to the five recommended healthy lifestyle behaviors: not smoking, getting adequate physical activity, eating a balanced diet, moderating alcohol intake, and maintaining a healthy body weight (Stampfer, Hu, Manson, Rimm, & Willett, 2000, van Dam et al., 2008). Key inhibiting factors for nurses' health

promotion and practice have been identified in the literature as workplace stressors such as time constraints, limited health promotion training, and the organizational culture of the workplace environment (Carlson & Warne, 2006; Casey, 2007; Hope, Kelleher, & O'Connor, 1998; Kemppainen et al, 2012; Rush, 2006; Wallace, 2006).

Work environment

The workplace is not only a place of employment in which a trade or business is conducted but one in which an individual or group of individuals collectively gather to accomplish a task, create products or provide services in exchange for wages. A workplace should have an environment conducive to getting a job done in which the climate of community, noise, air, light, and safety, and space are welcoming and supportive. A healthy workplace is one that creates an environment that is safe, satisfying, and empowering (ANA, n.d.).

The struggle for safe workplaces. Workplace safety has been and continues to be a long struggle for workers who fought for compensation for work-related injuries, reducing exposures to risks and implementation of safety standards. Historically, workers were the drivers for workplace regulation, legislation, and subsequent compensation for job-related injuries or fatalities due to unsafe work practices. Socialist worker movements gave rise to labor organizations and worker protections at the turn of the last century but gains were usually associated with political and financial incentives. Miners, railroad, and construction workers gained rights and safety regulations but hospital workers' safety was limited. It was suggested that because of the nature of the work, as domestic labor, the class of the employed, and the gender, and quite possibly the people it served (the poor and indigent) that hospitals were slow in adopting safety and worker standards for its employees (Kalisch & Kalisch, 2004).

Workplace legislation and regulation. Two important pieces of legislation relevant to nurses' worker protections occurred in the last century. The first, the National Labor Relations Act ("NLRA") also referred to as the Wagner Act (1935) was designed to protect the rights of employees and employers, to encourage collective bargaining, and to curtail certain private sector labor and management practices, which can harm the general welfare of workers, businesses and the U.S. economy. Yet, the Taft-Hartley Act of 1947 overturned these gains by making non-profit hospitals exempt from the same labor rights enjoyed by other workers. Nurses wage disparities were illustrated to help amend the Act in 1974 to restore collective bargaining.

A second important piece of legislation was passed in 1970—The Occupational Safety and Health Act to assure the health and safety of the workplace by setting and enforcing workplace standards, trainings, outreach, education and assistance (U.S. Department of Labor, n.d.). The act was responsible for creating two federal agencies, the Occupational Safety and Health Agency (OSHA) overseen by the Department of Labor and the National Institute for Occupational Safety and Health (NIOSH) under the Centers for Disease Control and Prevention and the U.S. Department of Health and Human Services. OSHA is the regulatory agency created to educate and protect workers while NIOSH was responsible for conducting research and making recommendations for the prevention of work-related injury and illness.

Hospital nurses'. Registered nurses (RN) hereafter for the means of this study will be referred to simply as "nurses". To earn the title of RN and become licensed, nurses must complete a program of higher education from one of three paths: a bachelor's degree in nursing, an associate's degree in nursing, or a diploma from an approved nursing program and pass the National Council Licensure Examination (NCLEX-RN). In addition, many States have additional educational requirements and fees that permit nurses to practice. Internationally trained nurses

must also complete minimum practice requirements and have met legal requirements to be employed in the US.

Nursing work is diverse as is their workplace environment. (RNs). Nurses graduate as generalists, trained in a variety of settings such as medical-surgical, pediatrics, obstetrics and gynecology, psyche, and for BSN trainees, public health nursing. Nursing roles and function vary according to their specialty as does their health and safety risks. For example, nurses working in the newborn nursery may not be at risk for musculoskeletal strain, as would those nurses working in an adult neurology unit. Nurses' work around the clock in shifts varying in length but typically 8 to 12 hours. Nurses' work is physically, mentally, and emotionally demanding requiring skills, precision, stamina, endurance, along with empathy and compassion. Nurses prioritize their caretaking duties in a dynamic workplace environment. This study hopes to identify the workplace environmental factors that may impact nurses' health.

Theoretical Framework

The health of the individual is closely tied to the health of the environment and community. Nurses in this study work within the broader community of the health care culture of the hospital workplace environment. Their lifestyle choices cannot be separated from the contextual factors of the workplace environment nor the role or identity of nurses' work (Stokols, 2000). The interrelationships of lifestyles, perceived health, and workplace environment can be examined using Bandura's social cognitive theory (SCT) and the socioecolocial theory (Bandura, 1986; Green, Richard, & Potvin, 1996; Figure 1).

Bandura's social cognitive theory, once called the social learning theory, uses the model of triadic reciprocal determinism in which the personal factors (nurses' perceived health), the environment, and behavior (lifestyles) are interconnected. Using a triangle to conceptualize SCT,

the three sides represent nurses' lifestyles', perceived health, and the hospital work environment connected by bidirectional arrows representing the effect each has upon the other. "People are both products and producers of their environment" signifies concepts of agency, which later evolved into the concept of self-efficacy (Bandura, 1989, p.4). People have free will and choices but their environment ultimately impacts the decisions they make (Bandura, 2004).

Socioecologic theory, evolved from systems theory, is viewed from the broader societal perspective recognizing the interplay and connectedness of the person, society, and environment conceptualized as ever-expanding nested concentric circles.. In socioecologic theory, health is the product of the interrelationships between the person, and the ecosystem (family, community, culture, physical, and social environment; Green et al., 1996). The differences between SCT and socioecologic theory can be understood from varying perspectives of the individual or the society. Both theories recognize the interplay between the person, environment, and the resultant choices made by the individual and have been applied to health and health promotion theories (Bandura, 2004; Green, Richard, & Potvin, 1996; Stokols, 2000).

Purpose and Aims

The purpose of this study is to examine the lifestyle behaviors, health, and hospital workplace environment of U.S. registered nurses (RNs). The specific aims are:

Aim 1. To examine the literature on nurses' lifestyle practices of physical activity and diet and health-related outcomes.

Aim 2. To describe U.S. hospital nurses' lifestyles, and perceived health.

Aim 3. To describe U.S. hospital nurses' workplace health and safety environment.

Presentation of the Dissertation

This dissertation is presented in five chapters. Chapter one includes the background, significance and introduces the dissertation aims. Chapter 2 is a systematic review of research spanning from 2006 to 2016 with two aims: to describe U.S. nurses' healthy lifestyle practices of physical activity and dietary practices and the health-related outcomes. Chapter 3 is a descriptive study of nurses' perceived health and healthy lifestyles and as surveyed from 2014 to 2016 by the American Nurses' Association HealthyNurse health risk appraisal. Chapter 4 is a continuation of an analysis of the HealthyNurse survey data from hospital nurses' workplace environment reported as a descriptive study. Chapter 5 summarizes the research findings, conclusions, and implications and recommendations for research, practice, and policy. Chapter 2, 3, and 4 are presented as ready for publication with Chapter 2 the systematic review, will be submitted to a peer-reviewed journal.

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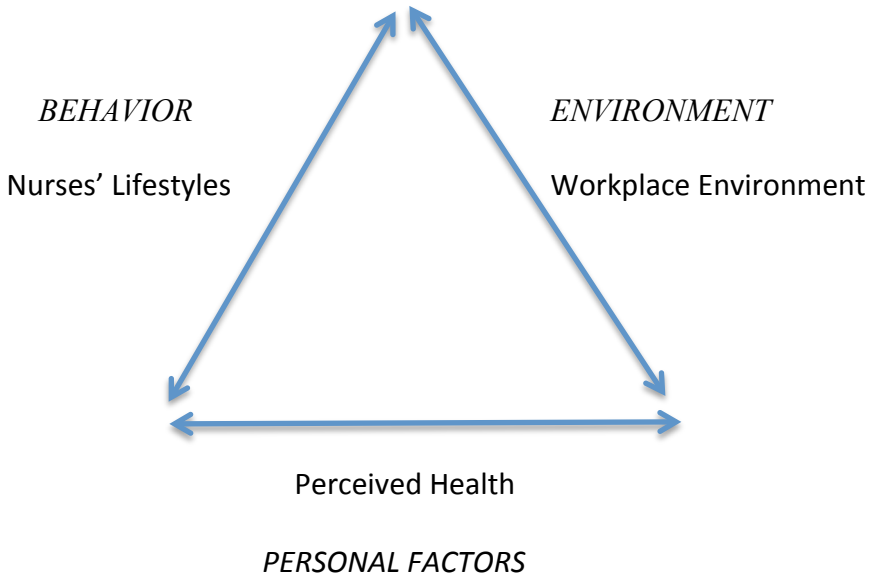
Figure 1. Conceptual Representation of Nurses' Lifestyles, Perceived Health and Workplace Environment



Chapter 2

U.S. Hospital Nurses' Lifestyles and Health-Related Outcomes:

A Systematic Review

Chapter 2

U.S. Hospital Nurses' Lifestyles and Health-Related Outcomes:

A Systematic Review

Abstract

Background

Nurses' modifiable lifestyle practices have important health consequences, however, there is a lack of systematic evidence on the impact of these lifestyle practices on nurses' health-related quality of life (HRQOL) and cardiovascular disease (CVD) risk.

Purpose

To examine the literature on U.S. hospital nurses' physical activity, diet, and health-related outcomes on nurses' health.

Methods

A systematic review of the literature from June 2006 to June 2016 resulted in 13 studies on U.S. hospital nurses' diet and physical activity practices and subsequent health related quality of life and cardiovascular risk including obesity, hypertension (HTN) and stroke. Methodological rigor was assessed using Cummings et al., (2010) adapted quality rating tool.

Results

Nurses are at risk for poor health outcomes due to inadequate physical activity (60-74%) and for not eating a healthy diet (53-61%). Nurses (29%) are less physically active compared to U.S. women (43%), although more nurses (44%) consumed the recommended (5) daily fruits and vegetables than U.S. women (30%). In all, fewer than 5% of U.S. nurses adhere to five healthy lifestyle behaviors (recommended diet, daily physical activity, no tobacco, moderate alcohol, and a healthy weight (BMI $\leq 25 kg/m^2$). Adequate physical activity contributes to a better health-

related quality of life and eating a healthy diet reduces risk of CVD and CVD risk factors (HTN, diabetes mellitus [DM], obesity, stroke).

Conclusions

Many nurses do not practice healthy lifestyles and their unhealthy lifestyle practices increase their risk of cardiovascular disease and diminished their HRQOL.

U.S. Hospital Nurses' Lifestyles and Related Health Consequences: A Systematic Review

With more than 4.1 million nurses in the United States, nursing is the nation's largest health care profession (Budden, Zhong, Moulon, & Cimiotti, 2013). Nurses' lifestyle practices have important consequences for their health—consequences that can affect risk for cardiovascular disease (CVD) and health-related quality of life (HRQOL). In addition, nurses' wellbeing and health may directly impact the health of the population as well as patient care (Blake & Harrison, 2013; Carlson & Warne, 2006; Gillen, 2014).

State of Research on Lifestyle Science

Internationally, research on nurses' health has focused primarily on the role of district (or public health) nurses in community health settings while a few exploratory studies have investigated the health behaviors of hospital nurses in the United Kingdom's National Health Service (Blake & Lee, 2007; Irvine, 2005). Health promotion studies have focused primarily on nurses' clinical skills using health promotion with patients, but a few have investigated nurses' personal lifestyle practices (Carlson & Warne, 2006; Campanian, Tossavainen, & Turnen, 2013). Although these studies have added to our knowledge of nurses' healthy lifestyle practices, few of the studies have been conducted on nurses in U.S. hospitals. To our best knowledge, no study has systematically reviewed lifestyle practices among nurses and the impact of these healthy practices on nurses' own health. Examining individual lifestyle behaviors or practices will provide insight into which behaviors are most challenging to maintain to improve nurses' health.

Effect of Lifestyle on Cardiovascular Disease (CVD) & Health-Related Quality of Life (HRQOL)

Unhealthy lifestyle practices are related to an increase in morbidity, earlier mortality, and diminished HRQOL (Ford, Bergmann, Boeing, Li, & Capewell, 2012; Loef & Wallach, 2012; Mokdad, Marks, Stroup, & Gerberding, 2004; World Health Organization [WHO], 2011). In fact, studies based on the Nurses' Health Study (NHS)— the longest and largest study on nurses' health—reveal that 3% or fewer nurses practice healthy lifestyles: eating a healthy diet, getting regular exercise, maintaining a healthy weight, and not smoking (Ford et al., 2012; Stampfer, Hu, Manson, Rimm, & Willett, 2000; van Dam, Li, Spiegelman, Franco, & Hu 2008). Although nurses' role is to improve, support, and maintain the health of those they serve, through engagement in unhealthy health lifestyles nurses may be neglecting their own health and putting themselves at higher risk for greater morbidity and mortality (Rockhill et al., 2001; Stampfer et al., 2000; van Dam, Li, Spiegelman, Franco, & Hu, 2008).

Effects of Nurse Lifestyle on Patient Care

Nurses' healthy lifestyle choices have positive effects in caring for patient populations (Miller, Alpert, & Cross, 2008; Zhu, Norman, & While, 2011). Nurses with healthy lifestyle practices are more apt to discuss and recommend preventive behaviors such as smoking cessation, getting physical activity, and eating a healthier diet to the people under their care (Esposito & Fitzpatrick, 2011; Frank**,** Bhat, Schobert**,** & Elon**,** 2003). Nurses who practice healthy lifestyles of daily physical activity, diet and sleep habits may be better able to prevent workplace injury and avoid errors related to fatigue (Geiger-Brown et al., 2012). Thus, improving the health and healthy lifestyles of nurses may improve patient care.

Goal and Aims of this Review

The goal of this systematic review of the literature is to better understand U.S. hospital nurses' lifestyle practices and the impact of these lifestyle practices on nurses' CVD risk and

HRQOL. The specific aims of the review are to (a) describe nurses' lifestyle practices—specifically, physical activity and diet, and (b) to examine the relationship between lifestyle practices and health outcomes of CVD and HRQOL.

Methods

Search Strategy and Data Sources

Systematic searches pertaining to U.S. hospital nurses' lifestyles—physical activity, diet and nurses' health related quality of life were conducted using the PubMed, Cumulative Index of Nursing and Allied Health Literature, and PsychInfo databases. The databases were searched for articles published from June 2006 to June 2016 using keyword expressions *nurses*/*nurses' healthy lifestyles* OR nurses' *health related quality of life* AND *diet* OR *physical activity*. In addition, search terms: *Nurses' Health Study* AND *health related quality of life* OR medical subject headings (MeSH) *Healthy lifestyles* AND *quality of life* AND *Nurses'* OR *Nurses' health* AND *lifestyles* were queried. These search terms were identified using PubMed and Medical Subject Headings aided by a specialized nursing librarian (MLF, Figure 1). Examination of publications associated with data from the NHS, manually searching texts and bibliographies resulted in one additional study. Duplicates were removed while publication titles were reviewed resulting in 378 studies. Abstract examination that applied inclusion and exclusion criteria reduced the number of potential candidate studies to 40; reading of the full text of these articles further reduced the number of candidate studies to 13 articles.

Inclusion and Exclusion Criteria

The inclusion criteria were (a) study population included U.S. hospital registered nurses, (b) variables included nurse lifestyle practices of physical activity or diet, (c) health outcomes of lifestyles included nurses' HRQOL, and CVD clinical risk factors including hypertension,

obesity, and stroke (d) articles were peer-reviewed and published between June 2006 and June 2016, and (e) published in English. In this systematic review, nurses' unhealthy weight, increased adiposity or body mass index (BMI) greater than 30 are treated as an outcome of unhealthy lifestyle practices rather than a modifiable factor. Smoking has been thoroughly studied in relation to health outcomes, and therefore not a focus of this review (Colditz et al., 1988; U.S. Department of Health and Human Services, 2001; Willet et al., 1987). Measuring the effects of combined lifestyle factors (most commonly: smoking, physical activity, diet, alcohol use, BMI) were included if data were given for physical activity and diet. The literature search's exclusion criteria were (a) registered nurses identified as non-hospital (i.e. community, public health, school, clinics, research academia, or administrative (b) student nurses, (c) unpublished manuscripts and dissertations, editorials and opinions.

Methodological Rigor Assessment

Two members of the research team (identified here as "JC" and "SP") independently rated each study for methodological rigor using an instrument designed and adapted by Cummings et al. (2010). Discrepancies in rigor assessment scores were resolved by consensus. Standard research critique qualifiers were listed in a matrix using four categories: design, sample, measurement, and statistical reliability. In this adapted version, rigor was judged as *being met* (1) or *not being met* (0). For the nine factors evaluated, a total score of nine points signified use of the highest quality methods. The studies were categorized into three divisions of methodological quality: *low* (0–3), *medium* (4–6), and *strong* (7–9; Table 1). Of the 13 studies, 12 used data from the NHS (a) used a prospective cohort, (b) justified their sample size, (c) used multisite sampling, and (d) used a validated instrument to measure adherence to the lifestyle practices.

Search Results

The initial search yielded 378 potentially relevant articles. After an initial review of abstracts, many papers were eliminated for not meeting the inclusion criteria. The remaining 40 articles were examined thoroughly for relevance of the study topic. A repeated review of these articles clarifying the directionality of lifestyle practices to health outcomes eliminated all but 13 studies. Through data abstraction and synthesis, an additional study was eliminated for failing to measure a lifestyle factor against an outcome, and another study was added by hand searching (Figure 1).

Data Abstraction and Synthesis

Five of the 13 studies were rated *strong*, seven as *medium,* and one as *low* for methodological rigor. All the studies rated *strong* were based on the NHS, in which their instrument's reliability and validity was confirmed and reported (Table 1). Assessment of methodological rigor determined that all studies used valid instruments and that the studies' statistical reliability was substantiated by adequate analysis. Differences in quality assessment were most marked in smaller studies unrelated to the NHS or used instruments that were adapted without validation and reliability. Adequate analysis was provided for all outcomes. None of the studies reported the use of a theoretical framework.

Characteristics of the Included Studies

The original NHS included more than 121,700 nurses with a response rate of 70%, followed by NHSII cohort enrolling 116, 430 nurses with a response rate of 85-90%. All the included studies defined their inclusion and exclusion criteria resulting in sample sizes ranging from 10,670 to 123,098 participants (response rate 90%) from either one of both cohorts.

Whereas, Nahm, Warren, Zhu, Ahn, & Brown (2012) was the only study not using NHS participants, had a sample size of 164 and a response rate of 21%.

Physical activity. Of the 12 studies with data on physical activity, three different measurement methods were applied to classify participants into risk groups based on acceptable levels of activity. When physical activity was measured as *time spent per week*, two studies found a range of 72-74% of nurses at high risk, meaning they did not adhere to the recommended physical activity level —that is, 30 minutes of moderate physical activity per day or 150 minutes per week (Chiuve et al., 2008; Nahm et al., 2012). Of the eight studies that used metabolic equivalent time (MET) h/week as measure of physical activity level, seven studies found nurses were not at risk of meeting a minimum 8.3 MET h/week criteria with a range of 7.8-27.9 MET h/week; however, the only score that was lower than the cutoff (7.8 MET h/week) was recorded in 1986 as series of biannual physical activity scores that trended upwards to 12.7 MET h/week in 1994 (Wolin et al., 2007). In addition, when the criterion of 18 MET h/week was used as the cut-off, 60%–74% of nurses were at high risk for poor health outcomes for not getting enough physical activity (Bes-Rostrello et al, 2008; Kroenke et al., 2008).

Dietary practices. Of the 12 studies that provided data on nurses' dietary practices in relation to health outcomes ten studies ranked diets are low or high risk, one measured alcohol, as a component of diet, and one measured mealtime regularity. Studies that ranked diet scores, where a healthy diet was defined as scoring in the upper 2/5, found that 53-61% of nurses were at high risk for a poor diet (Bazzano et al., 2008; Chiuve et al., 2008). Yet, when the cutoff for a healthy diet was the upper $1/5^{th}$ or 20^{th} percentile, 86% of nurses were at high risk diet (Forman et al., 2009). Alternatively, measuring meal regularity as a healthy diet indicator, 54% of nurses were high risk for not eating regularly (Nahm, 2012).

Combined lifestyle. In studies that measured lifestyles singly or as a summary score for combined lifestyle practices we see nurse adherence to healthy lifestyles decreases as the number of healthy lifestyle practices increases. Nurses (11%) adhered to three low risk lifestyles (not smoking, diet score in the top 40th percentile, and daily exercise equal to or greater than 30 min/day); 8% adhered to four healthy lifestyles (add weight as BMI < 25 kg/m^2); and 2% of nurses in were in accordance with at five lifestyle low risk factors (add alcohol 5-15 g/day; Chiuve et al. 2008; Forman, et al., 2009).

Healthy Lifestyle and Health Outcomes

HRQOL. Significant improvement in HRQOL was attributed to nurses' adherence to recommended levels of physical activity, dietary quality and higher intake of dietary flavonoids (i.e., oranges, berries, onions, and apples) (Kroenke et al., 2008; Samieri et al., 2014a; Samieri et al., 2014b, & Wolin et al., 2007). Women who increased their physical activity, over 4 and 10 year periods, had improved HRQOL scores with the greatest improvements seen in the physical activity subscore (PCS) signifying improvements in being able to improve their role functioning and ability to carry out their usual daily activities (Kroenke et al., 2008; Wolin et al. 2007). Increased consumption of dietary flavonoids and a higher diet quality contributed to factors of healthy aging: lower levels of chronic disease, improved cognitive function and signifying better health and wellbeing among aging female nurses (Samieri et al., 2014a; Samieri et al., 2014b). As women age and their health declines, improvements in HRQOL and functioning may delay mortality (Kroenke et al., 2008).

Cardiovascular disease. Three studies looked at nurses' healthy lifestyles in relation to their effect on cardiovascular clinical risk factors of diabetes, hypertension, obesity and stroke. Women who were unable to meet the recommendations for diet, BMI, smoking, alcohol, or

physical activity had a greater association with each individual clinical CVD risk factor with a hazard ratios (HR) of: 18.8 for diabetes (DM), 5.10 for hypercholesterolemia, 2.57 for hypercholesterolemia, and 52.5 for developing the high CVD profile (Sotos-Prieto et al., 2016). Chomistek et al. (2015) found 73% of CHD cases were associated with unhealthy lifestyles and nearly 46% of CVD risk factor cases (DM, HTN, high lipids) were attributed to an unhealthy lifestyle. Forman et al. (2009) also found 6 lifestyle factors to be independently associated with risk of developing HTN and an unhealthy weight (BMI>25) was the single most important predictor of incident HTN and when combined with other healthy lifestyles did not reduce the risk of HTN.

Diabetes. Bazzano et al. (2008) examined the effect of the dietary impact of fruit and vegetable consumption in relation to diabetes mellitus (DM) found that whole fruit and vegetable consumption prevents against DM. Yet, replacing whole fruit with fruit juice increased the risk of DM in adult female nurse participants.

Obesity. Risk for obesity as a lifestyle outcome was measured in three studies. Increased weight gain with aging was associated with a Western style diet (high risk— red and processed meats, refined grains, sweets and desserts, and potatoes), diets that had an increase in high energy dense foods, and for persons who were unable to eat at regular mealtimes (Bes-Rastrollo et al., 2008; Nahm et al., 2012; Schulze et al., 2006). Conversely women maintained or lowered their weight when decreased their dietary energy density adopted a "prudent" diet (i.e., a dietary pattern with a higher intake of fruits, vegetables, whole grains, poultry, and salad dressing) and ate at regular mealtimes (Nahm et al., 2012; Schulze et al., 2006). While 54% of the nurses had an irregular meal pattern, 59.2% of the participants were overweight (BMI > 25 kg/mg^2) or obese

(BMI >30 kg/mg^2) influenced in part by reported low levels of physical activity (Nahm, et al., 2012).

Stroke. In examining patients experiencing stroke Chiuve et al. (2008) reported that the combined influence of multiple positive health behaviors (i.e., not currently smoking, getting adequate physical activity, consuming a prudent diet, BMI less than 25.0 kg/m^2, and moderate alcohol consumption [5–15 g/day]) was greater than the individual effect of individual health behaviors. Individually, it was noted that midlife BMI is more strongly associated with stroke than current BMI, light alcohol consumption was associated with a lower risk of stroke versus heavy alcohol consumption. Non-smoking, healthy BMI, light alcohol consumption, and better diet quality were independent predictors of total stoke in women (Chiuve et al., 2008).

Discussion

This systematic review found that many nurses do not practice healthy lifestyles and these unhealthy lifestyle practices increased their risk for cardiovascular disease and diminished their HRQOL. This review found that 72-74% of U.S. hospital nurses did not engage in aerobic physical activity measured as min/week or when averaging with MET/week 60-74% and 53-61% did not consume a healthy diet. Fewer than 5% of these nurses engaged in five combined healthy lifestyle behaviors—a lifestyle pattern associated with diminished HRQOL, and a high risk for developing cardiovascular clinical risk factors (e.g., hypertension, obesity, and stroke).

Although several studies reviewed found that the majority of nurses were not physically active as measured by minutes of exercise per week, many nurses were found to meet the required physical activity level in seven studies that used MET hours per week measurement. This marked discrepancy may be related to measurement issues such as the type and intensity of activities performed and self-report bias. Nevertheless, in comparison to the U.S. population

activity levels, the included studies found that nurses performed lower levels of physical activity than women in the U.S. where 42.6% were physically active and compared to the general population where 48% of U.S. females (age 25-64) are physically active (National Health Interview Survey, 2015), nurses in these studies reported lower levels of physical activity that did women in the U.S. and in the general population. This low level of physical activity reported by nurses may be due to work-related muscular-skeletal injuries and long work hours with few days off—factors that may have impinged upon the nurses' ability to engage in personal leisure exercise (Geiger-Brown et al., 2004). Given that an appropriate level of physical activity is crucial for decreasing risk for cardiovascular disease and other health issues (Fletcher et al., 1996; Physical Activity Guidelines Advisory Committee, 2008; U.S.D.H.H.S., 1996), future studies should investigate factors that impede nurses' engagement in adequate levels of physical activity and ways to improve nurses' participation in physical activity.

On average, approximately 39-47% of nurses reported a healthy diet in studies from the NHS that used food frequency questionnaires (FFQ). However, 54% of nurses did not engage in regular mealtime routines (Nahm et al., 2012). Also, given that a healthy diet in part, includes consuming an average of five fruits and vegetables per day, the same percentage (39-47%) of nurses who eat a healthy diet are also consuming their daily recommended number of fruit and vegetables (Forman et al., Fung et al., 2015; 2009; Samieri et al., 2014b). Unlike physical activity, nurses in the reviewed studies, were eating on average more fruits and vegetables than women in the general population. In the US, 33% of adult women consumed fruit two or more times per day and 27% who consumed vegetables three or more times per day (CDC, 2010). The results of this systematic review of the literature are consistent with the characteristics of those women who typically consume more fruit and vegetables, which includes women who are

college educated, older, and of higher socioeconomic status (CDC, 2010). However, more than half of nurses in this study still did not meet the recommendations for daily fruit and vegetables intake. Barriers to healthy eating among nurses may include lack of time, prohibitive cost, and the lack of availability of healthy foods at the workplace (Faugier, Lancaster, Pickles, & Dobson, 2001). Nurses have also cited family "gifts" (sweets) brought to the workplace as a factor that undermines healthy food choices (Cheung, 2003). A broader perspective that examines the challenges and responsibilities of working women may be useful in supporting nurses' dietary practices.

Combined Lifestyle Practices

This systematic review suggests that nurses reported a lower degree of participation in healthy behaviors compared to U.S. females when measuring adherence to combinations of modifiable practices such as abstinence from smoking, engagement in adequate physical activity, eating a healthy diet, and avoidance of excessive alcohol consumption (Chiuve et al, 2012). For comparison, a study by Ford et al. (2012) using the National Health and Nutrition Examination Survey (NHANES) data, found 16% of U.S. females practiced three lifestyle behaviors (abstinence from smoking, consumption of a healthy diet, and engagement in adequate physical activity), 37% practiced two of these behaviors, 35% practiced one of these behaviors, 13% of participants practiced none of these healthy behaviors. It seems that regardless of the knowledge that healthy lifestyles are valuable to reduce (cancer) health risks few women seemed to be able to adhere to such practices (Vidrine et al., 2013). Considering these findings, the need to further educate nurses on lifestyle recommendations may not be enough but understanding why nurses do not put their knowledge to practice may be critical to improve nurses' health (Fair, Gulanick, & Brown, 2009; Miller, Alpert, & Cross, 2008).

Impact of Lifestyles on HRQOL and CVD Risk

In this systematic review, the results of the studies were consistent across all domains regarding the beneficial outcomes of healthy lifestyle practices. That is, eating a healthy diet and getting the recommended daily physical activity will decrease risks for CVD and improve ones' HRQOL. Clinical cardiovascular risks of obesity, hypertension and stroke may be attributed to inadequate physical activity, an unhealthy weight (BMI>25), irregular meals, and a poor-quality diet (energy dense foods, high intakes of red and processed meats, refined grains, sweets, desserts, and potatoes) (Bazzano et al., 2008; Chiuve et al., 2008; Chomistek et al., 2015; Forman et al., 2009; Fung et al., 2015; Nahm et al., 2012; Schulze et al., 2006; Samieri et al., 2014a; Sotos-Prieto et al., 2016). Findings regarding the positive benefits of recommended physical activity and its subsequent improvement on HRQOL are consistent with earlier research involving the general population across age, gender, race/ethnicity, education level, smoking status, BMI, and among persons with chronic disease (Bize, Johnson, & Plotnikoff, 2007; Brown et al. 2003). Likewise, earlier studies based on the NHS data have found the risk of CVD decreases 57-83% with adherence to recommended healthy lifestyles of diet, exercise, and abstinence from smoking and overall is associated with a very low risk of coronary heart disease (Stampfer et al., 2000). Notably, nurses who specialize in cardiovascular care may be better equipped to model CVD health protective lifestyles better than national samples of women in the Nurses Health Study II (NHSII) and Behavioral Risk Factor Surveillance System (BRFSS) in diet, activity, and non-smoking (Fair, Gulanick, & Braun, 2009). In summary, engaging in unhealthy lifestyle practices may trigger increased risks for CVD and poor HRQOL.

Strengths and Limitations

This systematic review has many strengths because most of the studies use data from the NHS, have a large sample size representing 11 U.S. states and have moderate to strong methodological rigor. Yet, as Letvak posits, we don't know how many NHS nurses were actively working or were still in the profession when participating in the NHS or NHSII (2013). And while every attempt was made to limit the studies to samples of hospital nurses, we could only assume a majority of the sample were hospital nurses. U.S. hospital nurses comprise 63% of the total U.S. working nurse population; therefore, an assumption that the majority of nurses were hospital nurses was made when using the NHS data. Furthermore, standard measures of physical activity are limited to leisure time and do not account for the daily physical activities included in personal, work or household responsibilities. Also, the studies in this review relied upon self-report and thus were subject to recall error and social desirability bias.

Conclusions

This systematic review provides evidence that U.S. hospital nurses are not living healthfully and therefore are at risk for CVD and lower HRQOL. Knowledge of lifestyle practices of U.S. hospital nurses could potentially help to ameliorate, reduce, or eliminate deficits and barriers to achieving a healthier workforce. Future qualitative research may shed light on the barriers and facilitators of healthy lifestyle practices. Mandating that hospitals and their staff strive to create healthier workplaces could conceivably result in improvements in nurses' overall health. Nurses can lead the public as healthy role models by setting a standard for themselves and their patients to achieve healthier lifestyles. Guided by Nightingale's lamp, nurses and nursing could benefit from nurses' personal practice of behaviors that are conducive to good health.

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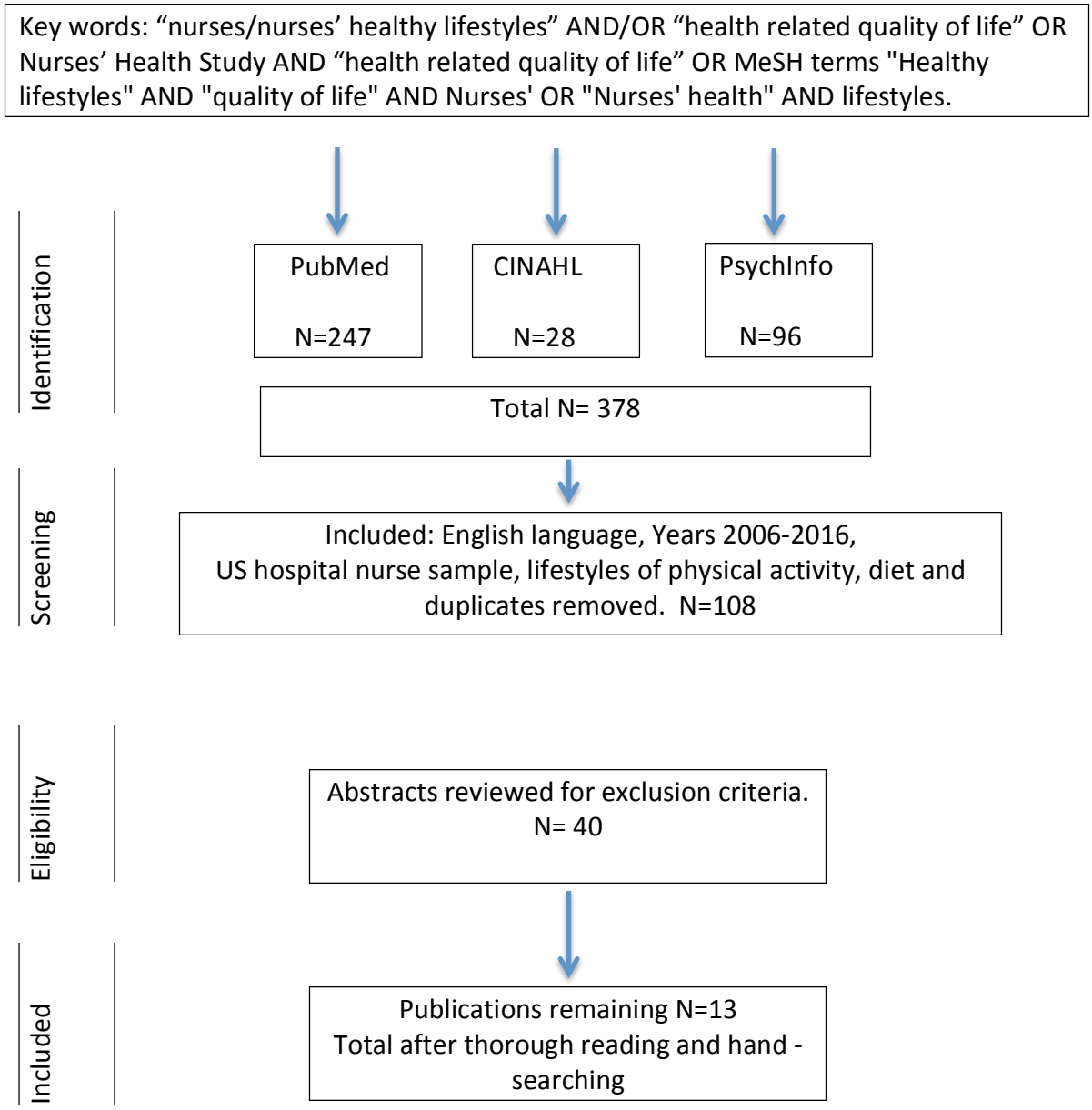

Figure 2.1.
Publication Selection Flow Chart/ PRISMA

Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Table 2.1.

*Methods Quality Grid**

	Design	Sample			Measurement	Statistical Reliability				
Study/ Author	Prospective Study	Sample size justified or appropriate	Multisite	Anonymity Protected (CHR approval)	Response rate greater than 60%?	Lifestyle measured Reliably?	Instrument Validity	Theoretical framework	If multiple outcomes studied was the analysis adequate?	Total score 0-9
Bazzano et al. (2008)	1	1	1	Not reported	1	1	1	0	1	7
Bes-Rastrollo et al. (2008)	1	1	Not reported	1	1	1	1	0	1	7
Chiuve et al. (2008)	1	1	Not reported	1	Not reported	1	1	0	1	6
Chomistek et al. (2015)	1	1	Not reported	1	Not reported	1	1	0	1	6
Forman et al. (2009)	1	1	1	1	1	1	1	0	1	8
Fung et al. (2015)	1	1	Not reported	1	Not reported	1	1	0	1	6
Kroenke et al. (2008)	1	1	Not reported	Not reported	Not reported	1	1	0	1	5
Nahm et al. (2012)	0	0	0	1	0	0	1	0	1	3
Samieri et al. (2014a)	1	1	1	1	1	1	1	0	1	8
Samieri et al. (2014b)	1	1	1	1	1	1	1	0	1	8
Schulze et al. ((2006)	1	1	Not reported	Not reported	1	1	1	0	1	6
Sotos-Prieto et al. (2016)	1	1	Not reported	1	Not reported	1	1	0	1	6
Wolin et al. (2007)	1	1	Not reported	1	Not reported	1	1	0	1	6

*Quality assessment tool adapted from Cummings, et al. (2010).

Table 2.2 Summary Literature Review Table				
Author (Year)	Dataset(s)	Sample characteristics	Variables/ Measures	Results
Bazzano et al. (2008)	Nurses' Health Study	N=71,346 Female nurses age 38–63 years.	Diet & Morbidity—Fruit, vegetable, and fruit juice & Diabetes.	Increase of three servings/day in total fruit and vegetable consumption was not associated with development of diabetes (multivariate-adjusted hazard ratio 0.99 [95% CI 0.94–1.05]). The same increase in whole fruit consumption was associated with a lower hazard of diabetes (0.82 [0.72–0.94]). An increase of 1 serving/day in green leafy vegetable consumption was associated with a modestly lower hazard of diabetes (0.91 [0.84–0.98]). The same change in fruit juice intake was associated with an increased hazard of diabetes (1.18 [1.10–1.26]).
Bes-Rostrello, et al. (2008)	Nurses' Health Study II	N=50,026. Women age 36.5M ± 4.6y	Diet & Morbidity—Food energy density & weight gain	Dietary energy density (ED) was positively correlated with saturated fat (r =0.16), trans fat (r=0.15), and the glycemic index (r=0.16), but was inversely correlated with vegetable protein (r=-0.30), vegetables (r=-0.27), fruit (r=-0.17). ED was not significantly correlated with total fat intake as a percentage of energy (r=0.08).
Chiuve et	Nurses'	N=71,243	Combined (5) &	Low risk (24%)

Table 2.2 Summary Literature Review Table				
Author (Year)	Dataset(s)	Sample characteristics	Variables/ Measures	Results
al. (2008)	Health Study & Health Professionals Follow-up Study		Morbidity—Tobacco, BMI, P/A, alcohol, diet score & Stroke.	exercising at least 30 minutes/day for 5 days per week of mod-vigorous activity. Not or former smoker (84%) Optimal weight (58%). Daily exercise (24%), Moderate alcohol (19%). Diet scores: AHEI 40%, DASH 47%, Healthy 6 Nutrient 42%.
Chomistek et al. (2015)	Nurses' Health Study II	N=69,247. Women ages 27 to 44 years at baseline.	Combined (4) & Mortality. Tobacco, BMI, PA, diet & CHD	Compared with women with no healthy lifestyle factors, the hazard ratio for CHD for women with 6 lifestyle factors was 0.08 (95% confidence interval (CI): 0.03 to 0.22). Approximately 73% (95% CI: 39% to 89%) of CHD cases were attributable to poor adherence to a healthy lifestyle. Similarly, 46% (95% CI: 43% to 49%) of clinical CVD risk factor cases were attributable to a poor lifestyle.
Forman et al. (2009)	Nurses' Health Study II	N=83,882 Women aged 27 to 44 years	Combined (6) & Morbidity. P/A, diet, BMI, alcohol, nonnarcotic analgesic, folic acid & Incident hypertension	The 6 low-risk factors for hypertension were a body mass index (BMI) < 25kg/m^2, a daily mean of 30 minutes of vigorous exercise —PAR=14% (95% CI, 9%-19%). Diet in upper 1/5^{ths} —14% (95%CI, 10%-17%) for not following a DASH style diet. BMI alone was the most powerful predictor of HTN, with a BMI of 25 or greater having an adjusted PAR

Table 2.2 Summary Literature Review Table				
Author (Year)	Dataset(s)	Sample characteristics	Variables/ Measures	Results
				of 40% (95% CI, 38%-41%) compared with a BMI of less than 25.
Fung et al. (2015)	Nurses' Health Study, Nurses' Health Study II & Health Professionals Follow-up Study.	N=123,098 NHS. N=72,495 NHSII N= 22,973 HPFS	Diet & Morbidity—Diet quality and Weight change (BMI). Alternative Healthy Eating Index-2010, Dietary Approaches to Stop Hypertension, Alternative Mediterranean Diet,	Significantly less weight gain over 4-y periods with each SD increase of each diet quality score in both men and women. Results were significantly stronger in the younger cohort (NHS II) than in the older cohorts (e.g.,20.67 kg less weight gain in NHS II vs. 20.39 kg in NHS for each SD increase in AHEI- 2010; P-heterogeneity: <0.001). Improvement of any of the diet scores benefited overweight (20.27 to21.08 kg less weight gain for each SD increase in score) more than normal-weight individuals (20.10 to 20.40 kg; P-interaction: <0.001).
Kroenke, et al. (2008)	Nurses' Health Study,	N=40,337. Women aged 46 to 71 years baseline in 1992.	Health-related quality of life (HRQOL) Mortality	Change in PCS score predicted mortality across the range of 4-year change: severe decline (relative risk [RR]=3.32; 95% confidence interval [CI]=2.45, 4.50), moderate decline (RR=1.44; 95% CI=1.16, 1.79), slight decline (RR=1.35; 95% CI=1.12, 1.63), no change (reference category), improvement (RR=0.72; 95% CI=0.56, 0.91; continuous P<.001).

Table 2.2 Summary Literature Review Table				
Author (Year)	Dataset(s)	Sample characteristics	Variables/ Measures	Results
				MCS similar results.
Nahm et al. (2012)	Perceived Stress Scale	N=183 Nurses from an urban teaching hospital.	Combined (3) & Morbidity— Physical activity, diet, body mass index (BMI) & Stress	Nurses (72.2%) stated they were not getting enough exercise. Irregular meal pattern (53.8%). The average body mass index (BMI) was 28.3 kg/m^2, and 59.2% were either overweight or obese.
Samieri, et al. (2014).	Nurses' Health Study.	N=10,670. Women with dietary data and no major chronic diseases between 1984 and 1986, when they were in their late 50s and early 60s (median age, 59 years).	Diet & Morbidity. Diet & Healthy aging, Alternative Mediterranean Diet, Alternative Healthy Eating Index-2010	Greater adherence to the AHEI-2010 (upper vs. lower quintiles) in midlife was related to 34% greater odds of healthy versus usual aging. Greater adherence to Alternate Mediterranean diet was related to 46% greater odds of healthy aging.
Samieri, et al. (2014b).	Nurses' Health Study.	N=13,818. Women with no major chronic diseases in 1984–1986 when they were aged in their late 50s (median age: 59 y).	Diet & Morbidity. Dietary flavonoids (oranges, berries, onions, and apples) and healthy aging (free from chronic disease. Food Frequency Questionnaires (FFQ), & Medical Outcomes SF-36	Of women who survived until 70 y of age (11.0%) healthy aging. Compared with women in the lowest quintile of intake, women in the highest quintile of intake of several flavonoid subclasses at midlife had greater odds of healthy aging. OR: flavones, 1.32 (95% CI: 1.10, 1.58); flavanone,1.28 (95%CI: 1.08, 1.53); anthocyanin, 1.25 (95%CI: 1.04, 1.50); and flavonol, 1.18 (95% CI: 0.98, 1.42) (all *P*-trend = 0.02).
Schulze, et	Nurses'	N=51,670.	Diet & Morbidity.	Women who increased

Table 2.2 Summary Literature Review Table				
Author (Year)	Dataset(s)	Sample characteristics	Variables/ Measures	Results
al. (2006)	Health Study II	Women 26 to 46 years old.	Western v prudent diet & Weight change. Food Frequency Questionnaire	their Western pattern score had greater weight gain (multivariate adjusted means, 4.55 kg for 1991 to 1995 and 2.86 kg for 1995 to 1999) than women who decreased their Western pattern score (2.70 and 1.37 kg for the two time periods). Women who increased their prudent pattern score, weight gain was smaller (multivariate-adjusted means, 1.93kg for 1991 to 1995 and 0.66 kg for 1995 to 1999) than among women who decreased their prudent pattern score (4.83 and 3.35 kg for the two time periods) ($p < 0.001$). The largest weight gain between 1991 and 1995 and between 1995 and 1999 was observed among women who decreased their prudent pattern score while increasing their Western pattern score (multivariate adjusted means, 6.80 and 4.99 kg), whereas it was smallest for the opposite change in patterns (0.87 and -0.64 kg) ($p < 0.001$).
Sotos-Prieto et al. (2016)	Nurses' Health Study II	N=69,505	Combined lifestyles & Morbidity. Healthy Heart Score: tobacco, weight, physical activity, alcohol, & diet. Clinical	Women with higher predicted CVD risk based on the Healthy Heart Score (highest quintile versus lowest quintile) had significantly greater

Table 2.2 Summary Literature Review Table				
Author (Year)	Dataset(s)	Sample characteristics	Variables/ Measures	Results
			cardiovascular risk factors (diabetes mellitus, hypertension, hypercholesterolemia).	risk of each clinical risk factor individually (hazard ratios: 18.1 [95% confidence interval, 14.4–22.7] for diabetes mellitus, 5.10 [4.66–5.57] for hypertension, and 2.57 [2.40–2.75] for hypercholesterolemia). The hazard ratio for developing the high-CVD profile was 52.5 (33.6–82.1).
Wolin, et al. (2007).	Nurses' Health Study, .	N=63,152	Physical activity and Health-related quality of life (HRQOL). Medical Outcomes Study Short-Form 36	Among women with an increase in physical activity, the increase in quality-of-life scores ranged from 2.23 (95% confidence intervals [CI]=1.94–2.52) for mental health to 8.23 (95% CI=7.49–8.97) for role limitations due to physical problems. Increasing physical activity also was associated with greater increases in quality-of-life scores from 1996 to 2000 compared to women whose physical activity level was stable. The strongest association was for role limitations due to physical problems, where women with a clear increase in physical activity had a significant improvement (1.81, 95% CI=1.09–2.53) in the outcome.

Chapter 3

U.S. Hospital Nurses' Lifestyles and Health: A Descriptive Study

Chapter 3

U.S. Hospital Nurses' Lifestyles and Health: A Descriptive Study

Abstract

Background

Healthy lifestyles of diet (5 servings of fruits and vegetables/day), physical activity (150 min/week of moderate intensity), not smoking, moderate alcohol use, and sleeping 7-9 hours per day, have important health protective benefits that decrease the risk of chronic disease, improve health-related quality of life and longevity. Nurses' role is to maintain and support health, yet nurses may not be living healthfully and are at risk for poor health outcomes.

Purpose

To examine the lifestyle practices and health among U.S. hospital nurses. The specific aims are to describe nurses' (a) lifestyles (b) perceived health and (c) actual health.

Methods

This secondary analysis of nurses' lifestyles, perceived and actual health employed a cross-sectional descriptive study design with a convenience sample of 2,730 U.S. hospital nurses from the ANA HealthyNurse health risk appraisal online from October 7, 2013 to December 16, 2015. Lifestyle behaviors were assessed as "yes" for recommended diet, physical activity, sleep, tobacco and alcohol use. Perceived health measures for self-rated health (poor to excellent), role limitations (within 30 days) mental health (within 14 days) and emotional support (never to always). Actual health was as reported as "yes" to a diagnosed condition.

Results

Hospital nurses' adherence to a healthy diet (14%) and sleep (53%) were poorer than the nationally but nurses fared better in adequate physical activity (45%-47%) not smoking, and

moderate alcohol use. Self -rated health was rated very good or excellent in 48% of nurses versus 65% of adult women and nurses had fatigue 5/14 days, yet, most (70%) get emotional support. Health diagnoses were: allergies 29.1%, low back pain 21.8%, migraines 17.9%, depression 17.8%; and weight with BMI ≤ 25 kg/m^2 42.9%, overweight 27.9%, obese 27.9%.

Conclusions

Nurses are not practicing healthy lifestyles, have lower levels of perceived health, are at risk for poor health outcomes

Chapter 3

U.S. Hospital Nurses' Lifestyles and Health: A Descriptive Study

Lifestyle, by choice or consequence, exerts a great influence upon one's health and well-being. Modifiable lifestyles behaviors such as consuming a healthy diet, daily physical activity, not smoking, and moderate alcohol consumption may prevent greater than 50% of morbidity and early mortality in the US (Danaei et al., 2009; Mokdad, Marks, Stroup, & Gerberding, 2004). The benefits of maintaining a healthy lifestyle are clear, yet, nurses may be unable to adopt these behaviors. Indeed, studies from the Nurses' Health Study (NHS), the largest and longest study on nurses' health, spanning decades since 1976, found that fewer than 5% of nurse participants adhered to the U.S. recommendations on healthy lifestyle behaviors: not smoking, getting adequate physical activity, eating a balanced diet, moderating alcohol intake, and maintaining a healthy body weight (Ford et al., 2012; Stampfer, Hu, Manson, Rimm, & Willett, 2000; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2008; 2010; van Dam, Li, Spiegelman, Franco, & Hu 2008). In an unpublished systematic review of studies that investigated nurses' lifestyles, 8 of 12 studies that used NHS data reported that 60-74 % of the nurses did not adhere to the 2008 U.S. Physical Activity Guidelines for physical exercise, and approximately 53-61% did not adhere to the 2010 U.S. recommended dietary guidelines (U.S. Department of Agriculture and U.S. Department of Health and Human Services [U.S. DHHS], 2008; 2010). Nurses' nonadherence to physical activity and dietary guidelines puts them at high risk for poor health outcomes (Chiuve et al., 2008; Chomistek et al., 2015; Sun et al., 2012).

Nurses' adherence to healthy lifestyle practices is beneficial; for example, research has reported that nurses' engagement in adequate physical activity, eating a healthy diet, and not smoking improve their personal health, health-related quality of life, decrease their risk for

developing chronic diseases, and may improve longevity (Blake & Harrison, 2013; Carlson & Warne, 2006; Kroenke, Kubzansk, Adler & Kawachi, 2008; Samieri et al., 2014; Stampfer, Hu, Manson, Rimm, & Willett, 2000; Sun et al., 2012, van Dam, Li, Spiegelman, Franco, & Hu, 2008; Wolin et al., 2007). In addition, studies have shown positive correlations between healthy lifestyles and nurses' professional self-concept, role adequacy, the ability to engage in caring relationships, application of nursing knowledge, sharing health information and the ability to be health care leaders (Hensel, 2011). Nurses who adhere to healthy lifestyles perceive that they are more efficacious health promoters and positive role models (Rush, Kee & Rice, 2005). The potential for improving health would be particularly beneficial if all nurses were empowered to live healthfully. Although research from the NHS is compelling, their study data is not easily accessible, and to our knowledge, the unique lifestyles of U.S. hospital nurses has not been examined.

The purpose of this study is to assess lifestyle practices and health among US hospital nurses. The specific aims are to describe nurses' (a) lifestyle health practices (b) perceived health and (c) actual health.

Methods

Study Design

This cross-sectional descriptive study used data from the American Nurses Association (ANA) HealthyNurse health risk appraisal survey, which collected data from October 7, 2013 to December 16, 2015 to conduct a secondary analysis of nurses' lifestyles and health.

Sample

A convenience sample of 7,642 pre-and post-licensure RNs voluntarily completed the survey. The final sample size, 2,730 participants (37%), was determined after incomplete and

duplicate surveys were removed and the inclusion and exclusion criteria were applied. Included in the sample were post-licensure RNs who were actively employed at least part-time in nursing and who self-identified as employed at least 50% of their work time in an acute care hospital setting or in any subspecialty setting, including cardiology, critical care, emergency, medical–surgical, neonatal, neurology, obstetrics, oncology, orthopedics, pediatrics, peri-operative, and post-anesthesia. Excluded were (a) nursing students; (b) retired RNs; (c) nurses who stated that they were employed full time in a non-nursing role; (d) master's-prepared RNs who concurrently worked in acute care or in a hospital and who possessed an advanced practice license (advanced practice licensure in the U.S. is limited to nurse practitioners); (e) doctorate-prepared nurses; and (f) RNs working in subspecialties representative of roles in academia and education, management and leadership, outpatient clinics, and community health.

Recruitment and Setting

The ongoing HealthyNurse survey remains a free personalized risk assessment available online at the ANA web site (www.nursingworld.org) accessed via the internet or a web search. The survey has been advertised on its website, via direct mail, in member literature, and in literature at ANA nursing conferences. Participation in the survey was voluntary. Accessibility to the survey required a computer or smart phone. Participants were asked if and where he or she lives within the United States or its territories.

Ethical Considerations

The ANA HealthyNurse survey respondents were assured health information privacy protection under the U.S. DHHS Health Insurance Portability and Accountability Act (HIPAA) of 1996 (ANA, 2013). This study received an Exempt Certification of the Institutional Review

Board of the University of California, San Francisco because the study used de-identified ANA survey data.

Measures

Data Collection Instrument: The ANA HealthyNurse Survey

Survey objectives. As stated earlier, this paper's data analysis used data from the ANA's HealthyNurse health risk appraisal survey. The survey solicits and compiles information on nurses' health, safety, and wellness—information that is relevant to nurses both personally and in the context of their workplace environment. Notably, the survey was designed to answer questions about nurses' health that had not been examined in the literature or in the Nurses Health Survey (NHS), including questions about the lifestyles of both male and female nurses of all ages, pre-licensure RNs, and the workplace environment. To achieve the survey's objectives, the instrument solicits "real-time" health data. Receiving results in real time enables the ANA to provide each respondent with a risk profile; based on the profile, respondents are directed to links on the Web Wellness Portal, which contains health and safety information specific to nurses. In addition, respondents can compare themselves with other nurses according to specific demographics (i.e., age, sex, ethnicity, nursing specialty, and geographic location; Carpenter & Harrington, 2013).

Survey development and utility The HealthyNurse survey was developed after a review of the literature and consultation with subject matter experts. A commissioned research group developed the survey's questions and metrics (ANA, 2014). To evaluate the questions, the research group used focus groups that comprised RNs, ANA members and staff, and employees of Pfizer Inc. (Carpenter and Harrington, 2013). The survey was then beta tested at the ANA Membership Assembly held in June 2013 (Carpenter & Harrington, 2013). The survey's content

validity was determined to be "relatively good." Because the HealthyNurse survey questions were derived from well-established national surveillance survey systems, data derived from the survey can compared with large national datasets, including those of Healthy People 2020, the National Health and Nutrition Examination Survey, and the Behavioral Risk Factor Surveillance Survey.

Survey structure. The HealthyNurse survey's 127 questions are divided into three categories: (a) demographics, (b) work environment, and (c) health, safety, and wellness (see Appendix A). The survey's demographics questions include age, gender, race, ethnicity, state of residence, nursing education and work experience, and affiliation with nursing organizations. The work environment questions examine occupational health and safety, risks: workplace climate, safe patient handling, sharps, bullying and violence, worksite wellness, fatigue, and presenteeism. The health, safety, and wellness questions encompass self-rated health, mental and physical health, health history, screening, prevention, nutrition, physical activity, sleep, and tobacco use.

The HealthyNurse survey, which is managed by Survey Monkey, requires approximately 20 minutes for completion. To access the survey, respondents first create a username and password; the use of a link to a privacy page further assures HIPAA compliance. The privacy page presents general information including changes in the policy (last updated March 4, 2015). The privacy page also describes the types of information that the survey collects (e.g., personally identifiable information, non-personal information, and aggregate information) and the nature of identifiable data; the privacy page also explains the way the data will be collected and used (Taking the Survey). Survey participants are informed that they will enter their responses

anonymously and their information will never be shared in any individual format or other way that would enable participant identification.

Survey constraints. Because respondent's personal risk assessment information is provided only to individual respondents, this confidential information was not accessible for use in the present study. Also, because this paper focused on U.S. hospital nurses' health and wellness, the analysis was limited to the data provided by hospital nurses.

Study Variables and Measures

Demographic and employment characteristics. Demographic variables were: age, gender, marital status, race–ethnicity, education, type of nursing license, years of nursing work experience, professional nursing organization membership, and U.S. state residency. Employment variables include: hours worked per week, shift lengths, and shift worked.

Nurses' healthy lifestyles include diet (measured as daily fruit and vegetable consumption), physical activity (both strength and aerobic training), total daily sleep duration, current daily tobacco use, and alcohol use. Response options for the lifestyle questions were "yes" and "no."

Diet. Participants were asked to report their dietary consumption within the preceding month by estimating the number of servings per day of fruit and vegetables. Data were not collected on the all food variables because fruit and vegetable consumption is a consistent indicator of a healthy diet. Total daily servings of a variety of fruits and vegetables were reported as "0," "1–5," or "*more*." Participants who consumed at least five servings of fruits and vegetables per day—the 2010 U.S. dietary recommended quantity—were recoded to "yes" as having met the minimum U.S. DHHS 2010 dietary recommendation.

Physical activity. In the ANA survey, muscle-*strengthening activities* were described as activities of yoga, sit-ups, push-ups, weight training (as in using free weights), elastic bands, or machines on two or more days (ANA HRA, 2013). *Aerobic physical activity* was described as at least 2.5 hours per week of moderate intensity, which includes walking 3 mph or faster, water aerobics, bicycling, or 1.25 hours per week of vigorous intensity (e.g., race walking, jogging or running, swimming laps, tennis, dancing, jumping rope or bicycling at 10 mph or greater speed (ANA HRA, 2013). Study participants reported the number of hours per week engaged in strength training and aerobic activity; these responses were then recoded "yes" or "no" to indicate whether participants met the then-current U.S. DHHS 2008 Physical Activity Guidelines.

Healthy sleep. Participants' average number of hours spent in sleep during a 24-period, including time spent napping, was indicated in 1-hour increments. To indicate whether participants met the recommended sleep guideline of at least 8 hours of sleep in a 24-hour period, these responses were recoded to "yes" or "no" responses.

Tobacco use was assessed by asking, "Do you currently smoke? (Yes/No)"

Alcohol consumption was measured in "units" per week (1 unit equals 12 fl oz of beer, 5 fl oz of wine, 8 fl oz of a malt beverage, or 1.5 fl oz of liquor; ANA, 2013). Responses were recoded to "yes" or "no*"* for consuming between 0–7 servings of alcohol per week.

Perceived health. The perceived health construct consists of measures to evaluate the participants' self-rated health, role limitations, mental health and emotional support (Table 5).

Self-rated health. Two global self-rated health measures "*Do you feel well today?*" with a corresponding *yes/no* response, and "*Would you say that, in general, your health is:"* with the response of *excellent, very good, good, fair, or poor*?

Role Limitations. Measured with two questions on how many days the participant was limited from doing *"usual activities*, *such as self-care, work or recreation*" within the past 30 days due to either physical/mental health limitations or due to pain limitations. Responses were from zero to 30 days.

Mental health. Measured with nine questions asking, *"Over the last two weeks how many days have you…*" had little interest or pleasure, felt down or depressed, had trouble with sleep, felt tired or with little energy, had a poor appetite or ate too much, felt like a failure, had difficulty concentrating, moved too slowly or was too restless, and had a decreased interest in sex. The respondent was asked to select the number of days (0-14) the respondent experienced each of these behaviors.

Emotional support. Measured with the question "*how often"* they received needed emotional support. The response categories were: never, rarely, sometimes, usually, always, and don't know/not sure.

Actual health. The participants completed a health history that began with the phrase, "Have you ever been told by a health care provider that you had . . . ." This phrase was followed by the phrase "Select all that apply" and a list of 15 health conditions (see Appendix A, Table 6). Other health questions included height and weight, which were reported in inches and pounds, respectively. Body mass index (BMI) was calculated from the answers and categorized as *underweight* (less than 18.5 kg/m^2), *normal* or *healthy weight* (18.5–24.9 kg/m^2), *overweight* (25.0–29.9 kg/m^2), and *obese* (greater than 30 kg/m^2; see Table 6).

Data Analysis

Data analysis was done using the IBM SPSS version 23 statistical software. Frequencies and percentages were calculated for categorical variables and means and standard deviations were calculated for interval variables.

Results

Demographics

Sociodemographics. The participants were middle-age (average age, 40 years ± 11.8 years) and female (91.8%). Nearly 70% of the nurses were married or in a domestic partnership, and 85% were non-Hispanic White. More RNs in this sample held a baccalaureate degree (45%) compared to those with an associate degree (31%). The hospital nurses who responded to the survey represented 50 U.S. states and the District of Columbia with the largest percentages of nurses residing in Texas (6%), California (6%) and Florida (6%). See Tables 1,2 and 3 for social and employment demographics.

Employment. About 32% of the participants had five or less years of nursing work experience and most of the nurses (84%) indicated that they were working full-time for at least 36 hours per week, albeit 37% of respondents worked 41–60 hours per week. Slightly over half (52%) of the nurses indicated that they were working 12-hour shifts—a substantially larger proportion than nurses working 8-hour shifts (20%), or nurses working more than 12 hours per day (17%). Also, about 60% of the nurses worked the day shift and one quarter worked the night shift. The largest subspecialties nurses reported were medical–surgical units (23%), critical care units (18%), or cardiology units (12%).

Lifestyle Characteristics

The health–safety–wellness section of the HealthyNurse survey includes items about nurses' modifiable lifestyle behaviors and health—both actual and perceived (Table 5,6).

- **Diet.** Only 14.3% (n=379) of the survey participants indicated that they were eating at least five servings of fruits and vegetables per day (2.5 cups)**.**
- **Physical activity.** Nearly 45% (45.3%) of the respondents indicated that they engaged in aerobic activity of at least moderate intensity for 2.5 or more hours per week, while 46.7% performed muscle-strengthening activities on 2 or more days per typical week.
- **Sleep.** More than half (56.9 %) of respondents indicated that they slept between 7-9 hours per day.
- **Smoking.** The majority (93.6%) of survey participants were not currently smoking cigarettes at all. Only 3.1% reported smoking on "some days."
- **Alcohol consumption.** Over 90% of the nurses in the sample was within the recommended limit of 0–7 alcohol servings per week (nurses who did not consume alcohol, 41.4%; nurses who consumed 1–7 drinks per week, 51.1%).

Perceived Health and Actual Health

Self-rated health. The majority of the participants **(**48.3%) reported very good to excellent health with 87% of the participants reporting they felt well "today" (Table 5).

Role limitations. Poor physical or mental health kept the nurse participants from engaging in their usual activities of self-care, work or recreation for an average of 2.7 (± 4.8 *SD*) days per month. Pain limited the participants from their usual activities for 2.6 (± 5.6 *SD*) days per month.

Mental health-related quality of life. In nine questions, mental health indicators spanning a two-week period resulted in a mean score of 2.8 days of poor mental health and an average of 5.1 (± 4.5 *SD*) days as *feeling tired or having little energy*. Nurses in the sample also

indicated that, during the 2-week period, they had "trouble falling asleep" or were "sleeping too much" on 4.3 days (± 4.6 *SD*); similarly, the respondents indicated that they "ate too much" or had a "poor appetite" on 4.3 days (± 4.7 *SD*) (Table 5).

Emotional support. Forty percent of nurses *usually* get the *emotional support* they need compared to 30% of nurses who *sometimes* have *emotional support* (Table 5).

Actual health. Nurses' most common physical health diagnoses were allergies (29.1%) followed by low back pain (21.8%), migraines (17.9%), and hypertension (15.0%). Nurses' most common mental health diagnoses were depression (17.8%) followed by anxiety (14.7%). The participants' weight status using their BMI was categorized as *normal/healthy weight* (42.9%), *obese* (27.9%), *overweight* (27.4%), and *underweight* (1.7%).

Discussion

This study examined the lifestyle practices, perceived and actual health (history) of a sample of US hospital RNs measuring adherence to recommended lifestyle practices. Compared with national statistics of U.S. nurses, hospital nurses in this sample were less diverse for age, race, ethnicity, and gender (U.S. DHSS, 2010). Greater diversity is found in populous urban areas where jobs are more plentiful, wages more competitive, and foreign recruitment is strong. In the present study, the mostly female hospital nurses average age was nearly five years younger and have less nursing experience than that of the national averages (U.S. DHSS, 2010). This study supports the research showing that younger nurses tend to work in hospitals while older nurses leave the bedside (U.S. HHSA, 2010). Male nurses in this sample were fewer on average than men in nursing nationally who tend to advance into clinical practice or leadership roles and positions with an average higher pay (Landivar, 2013; Muench, Sindelar, Busch & Buerhaus,

2015). We also see some disparity in State representation, an important consideration when accounting for U.S. regional variations of the economic, social, and cultural effects on health.

Although it was possible to estimate the number of nurses in this sample who were employed in academia, community health, and leadership, the present study focused on hospital nurses because hospital nurses have been known to have limited autonomy and agency in typically hierarchical health care systems, and consequently, these nurses may have poorer health (Marmot, 1994). In addition, the workplace environmental health and safety issues of hospital nurses are unique (sharps, patient handling, etc.) as indicated by the metrics used in the HealthyNurse survey. Nationally, about 63% of nurses' report working in hospitals compared to only 37% of the participants in this survey (Bureau of Labor Statistics, U.S. Department of Labor, 2014).

Employment characteristics have important influences on health and on one's ability to practice healthy lifestyle behaviors. In this sample, over half of the RNs work 12-hour shifts, and 40% of the nurses in this sample worked greater than full time —a work schedule that leaves little time for leisure physical activity or meal preparation. Although12-hour shifts and a compressed work week affords greater leisure-time it also allows for more overtime. Unfortunately, even though the majority of the participants indicated that they share their household with a partner, the dataset does not reveal whether household responsibilities are shared. However, in the United States, women, who comprise the majority of this study, are disproportionately responsible for the majority of the household duties (U.S. Bureau of Labor Statistics, 2015). Nurses, then, may be at risk for serious health ramifications like chronic fatigue while trying to manage household duties in addition to professional work responsibilities (Clissold, Smith, Accutt, & Di Milia, 2002). However, this work disparity may be an advantage,

if the women in this sample, primarily female, are responsible for the family meals and leisure activities and are thereby able to positively influence their family members' health-related lifestyle practices. However, if the burden of being both breadwinner and bread-maker falls on the shoulders of the working nurse, she (or he) may sacrifice personal health for in order to meet the family's domestic and economic needs (Grzwacz, Frone, Brewer, & Kovner, 2006).

Lifestyle Characteristics

Diet. A mere 14% of RNs indicated that they ate, on average, five fruits and/or vegetables per day. This was very low, compared to approximately 33% of female adults who consumed fruit two or more times per day, and 27% who consumed vegetables three or more times per day (CDC, 2010). In addition, the hospital nurse sample was considerably lower than nurses from the NHS of whom 39% to 47% consume the recommended 5 servings of total fruits and vegetables (Bazzano et al., 2008; Chiuve et al., 2008). The literature is conclusive regarding the health protective benefits of fruit and vegetable consumption reducing clinical cardiovascular risks of diabetes and obesity (Bazzano et al. 2008; Schulze et al., 2006; WHO, 1990). When examining factors of food choice in adult populations both external and internal factors may be at play. External factors include the high cost of fresh produce, followed by access or availability of fresh produce, the time constraints for shopping and food preparation, social interactions, media and advertising around food. Whereas internal factors include sensory appeal, familiarity and social habits surrounding food, desirability, preference, health knowledge, and personal ideology regarding food politics (Pollard, Kirk, & Cade, 2002). By understanding these factors hospitals can facilitate the provision of healthy diets for RNs by offering healthy affordable food choices 24/7, and providing a place for farmers' markets, which are also beneficial to the people they serve.

Physical activity. In the present study, RNs were on par with national averages for all U.S adult females' aerobic physical activity (45.3% versus 45.0%; NHIS, 2015). Yet, in this sample, the nurse participants 46.7% reported performing muscle-strengthening activities on 2 or more days per typical week compared to a mere 3% of females nationally (NIHS, 2015). The combined recommended aerobic and muscle-strengthening activity was much greater in this sample compared to 18.2% of women (age 25-64) nationally (NIHS, 2015). Physical activity has important benefits for improving health-related quality of life, ameliorating functional role limitations, and strengthening both mental health and physical health. The appropriate level of physical activity is critically important for decreasing risk for cardiovascular disease and other health conditions (Fletcher et al., 1996; Kroenke, Kubansky, Adler, Sunt, & Kawachi, 2008; PAG Advisory Committee, 2008; U.S. DHHS, 1996; Wolin et al., 2007). The importance of physical actively is especially true for hospital nurses who are engaged in the physically challenging tasks of lifting and moving patients. In these situations, physical activity confers important benefits in the prevention of musculoskeletal strain and injury. Yet, those who discourage manual lifting as unsafe, worry that fit persons may attempt to manually lift patients rather than rely on mechanical assistance.

Healthy sleep. In general, U.S. adult females sleep for an average of 8.8 hours in a 24-hour period compared an average of 7 hours of total sleep for nurse participants, translating into sleep debt and fatigue. (U.S. Bureau of Labor Statistics American Time Use Survey, 2014). In addition, hospital nurses sleep is less than working adults (24–55 years of age) who live in households with children under 18 years of age and get on average 7.7 hours per day. The NHIS (2008-2010) report 69% of U.S. adults get sufficient sleep whereas only 52.8 % of RNs in the ANA sample had sufficient sleep. The National Heart, Lung and Blood Institute (2012)

recommend adults obtain between 7-8 hours of sleep per day although individual sleep needs vary and sleep need decreases with age.

Nearly 40% of nurses in this study got an average of less than 6 hours sleep daily. Geiger-Brown (2012) studies nurses working 12-hour shifts, reports that on average nurses only get 5 hours of sleep between work shifts. For nurses whose sleep is inadequate, sleep deprivation effects may include slow reaction time, inability to think clearly, and cognitive performance deficits (Scott, et al., 2007). Sleep deprivation may manifest as an increased likelihood of making medical errors, difficulty in conflict resolution, and unsafe driving (DiMilia, Rogers, & Akerstedt, 2012; Scott, et al., 2007). Medically, insufficient sleep puts nurses at risk for high blood pressure, hormone disruption (such as melatonin and the fat-regulators of leptin and ghrelin), and is the strongest predictor of pain in persons' age 50 or greater (McBeth, Lacey & Wilkie, 2014). Sleep deprivation may contribute to a nurses' emotional instability, weak impulse control, little tolerance for challenging co-workers or difficult patients resulting in unintended consequences and risks for bullying or abuse (Munakata et al., 2001). Also, people with chronic sleep problems may be at greater risk for earlier development of Alzheimer's disease (Spira et al., 2013). However, because nursing care must be conducted continuously—24 hours a day, seven days a week—a large fraction of nurses may be limited in their ability to choose their work schedules or shift.

Tobacco use. In the present study, we have further evidence of nurses' abstinence of cigarette smoking. Nurses' tobacco use rates were lower than those of the public (men, 17.3%; women, 13.5%; NHIS, 2015). Given these data, nurses' relatively low rate of self-reported use reduces their risk for tobacco-related diseases. Smoking continues to be the single largest preventable cause of morbidity and mortality in the U.S. (U.S. DHHS, 2014). The Surgeon

General recommendations are to abstain from all tobacco products. However, whether the nurses in this population are at risk for second-hand smoke in their homes cannot be determined from the data. Nevertheless, given that many hospitals have become smoke free, the assumption the workplace is not likely to be a risk factor for second-hand smoke is reasonable.

Alcohol consumption. This study found that the alcohol consumption of participating RNs was within the suggested guidelines. Recommendations for alcohol consumption among women vary according to consumption quantity, consumption frequency, age, pregnancy status, comorbidities, and cultural patterns (Senie, 2013). Two large cohort studies have reported that alcohol has protective benefits (Freiberg, et al., 2011; Sun et al. 2011). The NHS cohort of women 34–59 years of age found that, in comparison with alcohol abstinence, light-to-moderate alcohol consumption (1.5–29.9 grams/day) was health protective—specifically for lower risk of cardiovascular disease and successful aging (Sun et al., 2011). The Women's Health Initiative (WHI) reported lower total mortality (Hazard ratio [*HR]* = 0.81, 95% CI [0.72, 0.91]) and lower incidence of hypertension (*HR* = 0.76, 95% CI [0.65, 0.87]) with light-to-moderate use of alcohol (one to six servings per week; Freiberg, et al., 2011). Considering the reported health protective effects of light-to-moderate alcohol consumption, should we be concerned about the health of 41% of RNs in this study who abstain from alcohol? It appears the research remains controversial. The American Cancer Association (ACA) has reported an increased risk of certain cancers with daily alcohol use. Rather than encourage daily alcohol consumption, the ACA (2012) advises that "if you drink alcohol limit your intake."

Perceived Health

Self-rated health. Global self-rated health measures were lower than expected for this sample of nurses on very good to excellent health (sample 48.3% versus adult females 65.3%)

(National Health Interview Survey [NHIS], 2015). Fewer HealthyNurse participants report their health as *excellent* compared with a U.S. sample of respondents from the National Health Interview Survey (NHIS, 2015) data rating their health as *excellent* (35.9%) (Figure 1). Considering that the average age of participants in our study was 40 years, self-rated health is lower than might be expected. One might assume women of this age to perceive themselves as having better health than older women who as they age become more susceptible to chronic disease and as the incidence of chronic disease increases with aging, HRQOL decreases (Kroenke, et al., 2008; Sun et al., 2012).

Role limitations. A nurse's ability to work is contingent upon her or his physical and mental health. While a greater percentage of U.S. nurses (42%) who experience pain great enough to limit their daily activities compared to 37% of Canadian nurses, a direct comparison may be difficult to assess due to unequal health care access (*National Survey of the Work and Health of Nurses*, 2006). Canadians nurses may have better health care access and be treated for pain before it becomes chronic or worsens to limit activities of daily living.

Mental health indicators. Similarly, nurses reported more workdays missed due to poor mental health when compared to adults participating in the BRFSS (2010; Table 5). Variations in number of sick leave days and the rules for usage are not always straightforward. If nurses use their earned sick time, management degrades their annual performance evaluation. Although, notable in this study more than half of the nurses felt obligated to work when sick. Nurses on average, report taking more days off but also show up for work when sick, i.e. presenteeism. Whether due to dedication, commitment, poor staffing levels, lack of paid sick time, or fear of retribution from employers monitoring sick leave use, nurses report using more sick leave for health issues than do US adults and Canadian nurses.

Emotional support. Greater than half of the nurses felt they had adequate emotional support regardless of their marital status.

Actual Health

Compared to national averages reported by the 2011 BRFSS and NHIS data, nurses' health conditions average similarly with persons of like population demographics (Table 6). Few reported a history of myocardial infarction, stroke, COPD, and angina most likely due to nurses with these conditions retiring or were working in specialties other than as hospital nursing. Yet, in the case of allergies, the most frequent complaint of RNs, is significantly greater than 7% of the 2011 BRFSS participants who suffered from allergies. Slightly fewer nurses were diagnosed with anxiety and/or depression compared to national statistics (BRFSS, 2010; Kessler, Chiu, Demler, & Walters, 2005). In comparison with the BRFSS (2011) respondents in our study indicated that they had had much lower rates of hypertension and cancer (both skin cancer and other types of cancer). Interesting to note, though when comparing hospital nurses' health data with all study participants in the Executive Summary, the rates of hypertension and allergies is nearly double that of the hospital nurses. Hospital nurses tend to be younger with fewer chronic diseases, which may explain this phenomenon.

Body mass index. RNs in this sample compare better than American women (66 %) and with previous studies on hospital nurses (65%) having a body weight as overweight or obese (BMI > 25kg/m^2; Centers for Disease Control, [CDC] 2015; Nahm et al., 2012; Zapka, et al., 2009). Therefore, this sample has a relatively healthier body weight than previous studies measuring the weight of hospital nurses and adult females in the US (Nahm et al., 2012; Zapka, et al., 2009).

Strengths and Limitations of the Study

Strengths. This is the only known large national RNs sample specific for hospital nurses' healthy lifestyles, perceived health and their workplace environment. In addition, this sample of hospital nurses comes from across the US., have similar sociodemographics and can be generalizable to the broader U.S. hospital nursing population. The survey was designed by subject experts, a research team, evaluated by focus groups and beta tested. The content validity was deemed to be relatively good and since many questions were from well-established national surveillance survey systems comparisons could be made.

There are also many advantages to doing a secondary analysis includes time, money and accessibility. In this study, the ANA and Pfizer Inc. covered the time and cost of designing and implementing the ANA HRA. In addition, as a doctoral student, the expense of doing a secondary analysis compared to my own data collection was minimal, requiring only the purchase of the statistical software, tuition fees, and time spent to analyze the data and document the findings.

Limitations. The study has several limitations. First, although the survey content validity was reported, the reliability was not reported. The ANA employed a research team to develop the questions and metrics with many of the questions from well-established national surveys yet, there was no discussion about the consistency of the measures. Furthermore, it is not known if the survey was tested on the target population sampled (nursing students, retirees, and working nurses). Second, the study used a cross sectional design, thus the data provided by the participants is a snapshot of real-time data therefore, we cannot be sure if the same outcomes will be consistent over time. Third, the data was based on the participants' self-report. Self-report limitations may include faulty participant recall and social desirability bias. Although in this case the survey was designed for nurses voluntarily seeking a personal health assessment and

therefore, it would be unlikely they would purposefully provide incorrect data. Fourth, the study used a convenience sample (i.e., nurses participate in the survey via self-selection), non-probability sampling may not be generalizable to the larger sample of U.S. hospital nurses. Those who choose to participate in the survey may have a greater interest in the topics covered in the survey than nurses who did not. Thus, the findings of the study can only be generalized to the study participants. Lastly, the ability to take an online survey was limited to nurses who have access to a computer and to the Internet and who are comfortable using technology.

Implications for Future Research

The ANA HealthyNurse survey data has potential to be utilized to examine the relationships between healthy lifestyles, perceived health and the workplace environment. Although using secondary data has limitations, this dataset might be used to compare nurses' lifestyles among various subspecialties within or outside of the hospital environment. In addition, comparing the data of this survey to nurse salaries across the US may provide insight into health disparities. Regional socioecologic differences may also reflect differences in diet and physical activity behaviors.

Research on improving nurses' lifestyles has been minimal particularly in the US and is urgently needed (Letvak, 2013). Interventions to increase nurse fitness, meditation and massage to decrease stress, and creating healthy workplaces have been tested but not universally implemented. Studies are needed to find solutions to improve nurses' diet and sleep as well as approaches to change the organizational culture. Pilot studies, small unit based quality improvement projects, such as those offering a meditation space, "take the stairs", nap rooms, physical activity, and community meal preparations have been tried but the success is short lived if the environment does not support the changes in the long term (Blake, Zhou, & Batt, 2013;

Letvak, 2013; McElligott, Capitulo, Morris, & Click, 2010; Palumbo et al., 2007). In addition, since the ACA funding has been set aside for workplace wellness programs, an assessment of how nurses' use those services may be helpful. In addition, recognition that modifying behavior is limited unless the environment supports the change is essential, therefore assessment and corrections in the organizational culture and the workplace environment are critical.

Implications for Practice and Policy

The results of this study point to a potential knowledge deficit about recommended lifestyle behaviors. Workplace wellness centers are a relatively new phenomenon in healthcare facilities because of the incentives provided through the Affordable Care Act (Mattke, et al., 2014). Evidence supports workplace wellness facilities offers a greater return on their investment in keeping workers healthy by reducing absenteeism and the costs to employer sponsored medical plans (Baicker, Cutler, & Song, 2010). The National Health Service (NHS) in the United Kingdom evaluated a 5-year wellness intervention for NHS employees and found employees improved physical activity, reduced absenteeism, had an increase in job satisfaction and organizational commitment (Blake, Zhou, & Batt, 2013). Might we see a similar return on investment if applied to predominately female hospital nurses in the US? Nurses work 24/7 with nontraditional work schedules, irregular meal breaks, and are unable to take routine rest breaks. Nurses' may be standing for long hours, lifting or repositioning patients and dealing with the emotional trauma of ill or dying individuals. Moreover, nurses may have long work commutes or personal responsibilities that preclude their participation in onsite exercise classes. Providing nurses with exercise facilities may be futile when nurses may be physically and emotionally exhausted after dealing with the occupational stressors of the job. Napping during break-time, especially for nurses working shifts of 10-hours or longer and nurses working overnight shifts,

should be encouraged. Hospitals and nurse managers should support the provision of comfortable, quiet spaces or sleep rooms where lights can be dimmed, and nurses can recline if needed. Worksite wellness programs for nurses must be tailored to meet their needs.

To support a healthy diet, nurses on all shifts should have equal access to healthy food provisions. Creative family dinners or potluck meals may help to improve community and provide an opportunity for nurses to discuss healthy food recipes. Yet, too often sugary and salty foods and snacks are used to keep nurses nourished when break times are limited. A promising development that provides patients and staff with access to fresh produce has been the operation of farmer's markets at health care facilities. Typically, these markets are proactive steps in supporting prevention and healthy eating but the cost of foods may not be competitive. Creating healthy food options may be challenging when the status quo is interrupted. Nurse leadership in these areas may need collegial support and managerial buy-in.

Finally, policy recommendations may be the most important critical factor improving the workplace environment. Policy recommendations may have long term implications ranging from hospitals, State boards of nursing, or federally have potential if grass roots campaigns push for changes and once enacted become regulation in which workplaces must follow. State labor laws penalize employers who fail to provide adequate break time California. Incentives or disincentives have proven results.

Conclusions

Nurses comprise the largest segment of the health care workforce in the US, and their health should be considered as important as that of their patients. However, research evidence suggests that nurses are at elevated risk for unhealthy lifestyle behaviors, in particular for poor diet, inadequate sleep, and insufficient physical activity. Moreover, for these health care

providers, the risk of occupational injury for both physical and mental health is substantial. Thus, the imperative for U.S. hospital nurses to improve their health-related lifestyle behaviors and for hospitals, as employers, to support this improvement is clear. Through greater engagement in better health-related lifestyle practices, nurses are likely to experience the benefits of better health, reduced risk for chronic disease, and improved overall wellbeing.

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Table 3.1

Sociodemographic Characteristics of U.S. Hospital-employed Registered Nurses (N=2730)

Age (years)	Sample n=2725 (%)	National comparison n = 2,824,641 (%)
25 or younger	299 (11.0)	146,881 (5.2)
26-30	468 (17.4)	271,166 (9.6)
31-35	485 (14.6)	310,711 (11.0)
36-40	305 (11.1)	353,080 (12.5)
41-45	319 (11.7)	347,431 (12.3)
46--50	286 (10.4)	409,573 (14.5)
51-55	307 (11.3)	426,521 (15.1)
56-60	244 (8.8)	319,184 (11.3)
61-65	85 (3.1)	166,654 (5.9)
66-70	15 (0.4)	50,844 (1.8)
71 or older	2(0.0)	22,597 (0.8)
Mean	40.0 (*M*) ±11.8 (*SD*)	44.6 (*M*)
Gender	Sample n=2,712 (%)	National comparison n= 2,824,641(%)
Female	2,489 (91.8)	2,567,599 (90.9)
Race/Ethnicity	Sample n=2,869 (%)	National comparison n=2,826,463 (%)
White, non-Hispanic	2,389 (85.2)	2,128,779 (75.4)
African American/Black	176 (6.4)	279,639 (9.9)
Asian	127 (4.7)	234,445 (8.3)
Latino/Hispanic	98 (3.6)	135,582 (4.8)
Other	79 (2.9)	48,018 (1.7)
Marital status	Sample n=2725 (%)	National comparison (%)
Married/domestic partnership	1,870 (68.6)	(74.0)
Divorced-single	221 (8.1)	No data
Never married	582 (21.4)	No data
Separated	30 (1.1)	No data
Widowed	22 (0.8)	No data
Education (N=2730)	Sample n (%)	National comparison n (%)
Diploma (nursing)	73 (3.0)	194,900 (6.9)
Associate (nursing)	767(31.4)	1,070,538 (37.9)
Baccalaureate (nursing)	1,101 (45.0)	1,259,789 (44.6)
Masters (nursing)	210 (8.6)	Not available
Degree in another field	255 (10.4)	Not available

National data source: Health Resources and Services Administration. (2013). The U.S. Nursing Workforce: Trends in Supply and Education, (April), 57. American Community Survey (ACS) (2010)

Table 3.2

U.S. State Residency: ANA HRA Sample compared with National State Workforce (HRSA)[1]

Highest State Residency	Sample N (%)	National N (%)
Texas	167 (6.1)	186,573 (6.6)
California*	160 (5.9)	274,722 (9.7)
Florida	157 (5.8)	167,476 (5.9)
Georgia*	146 (5.3)	75,976 (2.7)
Utah*	130 (4.8)	18,771 (0.7)
Arizona*	122 (4.5)	50,841 (1.8)
Ohio	121 (4.4)	126,582 (4.4)
New York*	119 (4.4)	196,189 (6.9)
Illinois	102 (3.7)	120,203 (4.3)
Total subset	1225 (44.9)	1,217,333 (43.0)
Total Sample	2730(100.0)	2,824,641 (100.0)

*Under or overrepresented in ANA sample in comparison with national estimates

[1]Health Resources and Services Administration (HRSA) (2013). The U.S. nursing workforce: Trends in supply and education, (October), 57.

Table 3.3

Employment Characteristics of the Study Participants (N = 2,730)

License(s)	**Sample n (%)**
Registered Nurse	2,612 (95.7)
Advanced Practice RN*	18 (0.7)
Nursing Specialty Certification	522 (19.1)
Non-Nursing Specialty Certification	26 (1.0)
Years working as an RN	**Sample n (%)**
Less than 1 year	277 (10.2)
1–5 years	868 (31.9)
6–10 years	534 (19.6)
11-20 years	399 (14.4)
21-30 years	337 (12.4)
31-40 years	263 (9.7)
Greater than 40 years	45 (1.6)
Employment status (N-2912)	**Sample n (%)**
Actively working in nursing	2,696 (98.8)
Work status	**n (%)**
[a] Full time in nursing	2,269 (84.1)
Part-time in nursing	410 (15.2)
Hospital work setting	**Sample n (%)**
Medical-surgical	629 (23.0)
Critical care	482 (17.7)
Cardiology	314 (11.5)
Emergency	309 (11.3)
Peri-op	222 (8.1)
Oncology	209 (7.7)
Pediatrics	188 (6.9)
Obstetrics	147 (5.4)
Orthopedics	144 (5.3)
Neonatal	122 (4.5)
Neurology	120 (4.4)

[a] Full-time employment = works 36 hours or more per week

[b] Part-time employment = works less than 36 hours per week

* Advanced Practice—non-Advanced License in Nursing

** Health Resources and Services Administration. (2013). The U.S. Nursing Workforce: Trends in Supply and Education, (April), 57.

Table 3.4

Healthy Lifestyles of a U.S. Sample of Hospital-employed Registered Nurses (N = 2,730)

Characteristic Healthy Lifestyles	**n (%)**
Five Fruits and Vegetables servings per day	379 (14.3)
Physical activity: muscle-strengthening twice per week	1251 (46.7)
Physical activity: aerobic endurance 2.5 hours per week	1472 (45.3)
Healthy Sleep seven to nine hours per day	1537 (56.9)
Alcohol consumption per week: 0-7 servings	2509 (92.5)
No tobacco use	2537 (93.6)

Table 3.5 *Perceived Health of U.S. Hospital Nurses N=2730*	***n* (%)**	**National (%)***
Feeling well today (yes)	2,342 (86.8)	(N/A)
In general, your health is:		
Poor	11 (0.4)	(2.3)
Fair	312 (11.5)	(7.7)
Good	1,083 (39.8)	(23.8)
Very Good	901 (33.1)	(30.3)
Excellent	412 (15.2)	(35.9)
Mental Health Indicators (30 days)	**Days M (SD)**	**Days**
During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work or recreation?	2.7 M ± 4.8	2.0
During the past 30 days, for about how many days did pain make it hard for you to do your usual activities, such as self-care, work or recreation?	2.6 ± 5.6	
Mental Health Indicators (14 days)	**Days M (SD)**	
Had little interest or pleasure in doing things?	1.8 ± 3.0	
Felt down, depressed or hopeless?	1.7 ± 2.9	
Had trouble falling asleep, staying asleep or sleeping too much?	4.3 ± 4.6	
Felt tired or had little energy?	5.1 ± 4.5	
Had a poor appetite or eaten too much?	4.3 ± 4.7	
Felt bad about yourself or that you were a failure or had let yourself or your family down?	2.1 ± 3.7	
Had trouble concentrating on things such as reading the newspaper or watching the TV?	1.8 ± 3.3	
Moved or spoken so slowly that other people have noticed, or the opposite—being so fidgety or restless that you were moving around a lot more than usual?	0.8 ± 2.3	
Had decreased or no interest in sex?	3.5 ± 5.0	
Emotional Support	***n (%)***	
Never	40(1.5)	
Rarely	283 (10.5)	
Sometimes	805(29.7)	
Usually	1,086(40.1)	
Always	493 (18.2)	

* CDC/NCHS, National Health Interview Survey (NHIS), January–September 2015

Table 6
Actual Health of U.S. Hospital Nurses (N=2730)

Actual Health Conditions	***n* (%)**	**Nationally (%)***
Allergies	795 (29.1)	7% (NHIS, 2011)
Low back pain	595 (21.8)	29% (NHIS, 2011)
Migraine	488 (17.9)	17% (NHIS, 2011)
Depression	487 (17.8)	18% (depression disorder)
Hypertension	409 (15.0)	31% (NHIS, 2011)
Anxiety	400 (14.7)	18% (anxiety disorder; NIH)
Asthma	351 (12.9)	14%
Gastritis	194 (7.1)	N/A
Cancer-skin	95 (3.5)	6%
Diabetes	91 (3.3)	10% (diabetes mellitus)
Cancer-other types	71 (2.6)	6%
Angina	18 (0.7)	4% (angina/CHD)
COPD	17 (0.6)	6%
Myocardial Infarction	11 (0.4)	4%
Stroke	14 (0.5)	3%

* Behavioral Risk Factor Survey (BRFS), 2010—unless otherwise noted
Abbreviations: NHIS-National Health Information Survey (2015);
NIH-National Institute of Health (2005).
CHD-coronary heart disease; COPD- chronic obstructive pulmonary disease

Table 7
Body Mass Index (BMI) *of U.S. Hospital Nurses Compared with National Averages (N=2730)*

BMI Grouping (kg/m2)		***n* (%)**	**National Averages U.S. Females ***
Underweight	< 18.5	46 (1.7)	1%
Normal weight	18.5–24.9	1,148 (42.9)	31.7%
Overweight	25.0–29.9	734 (27.4)	28.1%
Obese	> 30.0	747 (27.9)	38.1%

*CDC/NCHS, National Health And Nutrition Examination Survey 2011-2014

Chapter 4

Hospital Work Environment of U.S. Registered Nurses

Chapter 4

Hospital Work Environment of U.S. Registered Nurses

Abstract

Background

Hospitals are considered one of the most hazardous workplace environments. Whereas, nurses comprise the largest segment of professionals employed by U.S. hospitals, the workplace environment poses a health and safety hazard for hospital nurses.

Purpose

The purpose of this study is to describe U.S. hospital nurses' perceptions of their workplace health and safety environment.

Methods

A cross-sectional descriptive design was used to analyze data from American Nurses Association HealthyNurse online health risk appraisal from October 2013 to December 2015 with a convenience sample of 2,730 U.S. hospital nurses. Workplace measures included: climate, risks, sharps, safe patient handling and mobility, bullying/violence, fatigue, workplace wellness, and absent/present.

Results

Nurses in this sample (female [92%], age [40.0M], White [75%], BSN/ASN [45%/31%] nursing experience 42% < 5 years) report risks of workplace stress (80%), musculoskeletal strain/disability (MSD; 60%), and hospital-acquired infections (HAI; 45%); with few nurses (26% and 34%) involved in safety technology selection and 75% of nurses had favorable employer perceptions. Bullying was experienced by: persons in authority (42%), peers (56%), patients or family (56%). Nurses worked: dayshift (58%), 12-hour shifts (52%), overtime (41%),

unplanned overtime (67%), and > 50% felt obligated to work when ill.

Conclusions

The workplace poses serious risks to nurses' health and safety; of paramount concern are workplace stress, MSD and HAI. Improving the hospital workplace environment may ensure a safe and healthy nursing workforce for the provision of optimal patient care.

Chapter 4

Hospital Work Environment of U.S. Registered Nurses

A healthy work environment is defined as "one that is safe, empowering, and satisfying" (American Nurses Association [ANA], 2016). Hospitals are considered among the most hazardous workplaces in the US, therefore, do not meet the definition of a healthy work environment (Bureau of Labor Statistics [BLS], 2013). Hospital workers suffer work-related injuries at a rate of 6.8 for every 100 full time employees, almost twice the rate of private industry (BLS., 2013). Registered Nurses (RNs) employed by hospitals represent the largest sector of nursing employment (63%) and constitute the largest segment of hospital employees. Collectively, RNs are the most vulnerable for multiple work place safety hazards due to the hospital workplace environment (BLS, 2015).

Hospitals exist to improve the health and wellbeing of the people and communities they serve: ensuring access to care, teaching healthy lifestyles, through leadership, education, innovation and excellence in medicine. Yet, RNs working in hospitals are at increased risk for injury and illness while supporting the health and in the care of others. The irony is that the hospital workplace poses health and safety risks to registered nurses who routinely work to safeguard the health and safety of their patients.

Background and Significance

Registered nurses (RNs), numbering between 3.1 to 4.1 million in the U.S represent a skilled class of educated, licensed professionals trained to care for the health of persons of all ages, from birth and until death (Budden, Zhong, Moulon, & Cimiotti, 2013; Bureau of Labor Statistics, 2015). In the U.S., nurses have been rated as the most trusted professionals for 17 years (Gallup, 2016). Registered nurses serve as role models for healthy lifestyles as they support

patients to achieve their optimal level of health and wellness (American Nursing Association [ANA], 2013).

RNs entrusted to support the health of the population are at risk for their own health and safety because of their work environment. The combined health and safety risk factors of a hospital environment result in one of the most dangerous places for nonfatal injuries and illnesses (BLS, 2013; National Institute for Occupational Safety and Health [NIOSH], 2016). Hospital nurses are exposed to multiple health and safety risks: infectious disease, musculoskeletal strain and injury from lifting, positioning and transferring patients, and violent patients. Workplace hazards put nurses at risk for physical injury, but nurses are also subject to psychosocial factors such as workplace stressors that can result in high levels of anxiety and depression, which may result in lower levels of perceived health and ultimately affect worker productivity and in the case of nurses' work affect patient care (McCaughey, McGhan, DelliFraine, & Brannon, 2011). As the projected growth of the nursing occupation increases by 16%, which is necessary to meet the needs of the aging population, we need to protect the health of nurses who are a vital asset for a healthy nation (BLS, 2015).

Aims

The purpose of this study is to describe the health and safety aspects of the hospital work environment of U.S. RNs.

Methods

Study Design and Source of the Data

This is a cross-sectional descriptive study, using the ANA HealthyNurse health risk appraisal survey data collected from October 7, 2013 to December 16, 2015. The data was

collected using The Survey Monkey tool. Permission to use the data has been granted by the ANA to complete a secondary data analysis.

Sample

A convenience sample of 7,642 pre-and post-licensure RNs voluntarily completed the ANA HealthyNurse health risk appraisal survey. Among these, this study included 2,730 participants (37%) after inclusion and exclusion criteria were applied. Inclusion criteria were post-licensure RNs who were actively employed at least part-time in nursing and who self-identified as employed at least 50% of their work time in an acute care hospital setting or in any subspecialty setting, including cardiology, critical care, emergency, medical–surgical, neonatal, neurology, obstetrics, oncology, orthopedics, pediatrics, perioperative, and post-anesthesia. Exclusion criteria were (a) nursing students; (b) retired RNs; (c) nurses who stated that they were employed full time in a non-nursing role; (d) master's-prepared RNs who may have concurrently been working in acute care or in a hospital and who possessed an advanced practice license (advanced practice licensure in the U.S. is limited to nurse practitioners); (e) doctorate-prepared nurses; and (f) RNs working in subspecialties representative of roles in academia and education, management and leadership, outpatient clinics, and community health.

Ethical Considerations

The ANA HealthyNurse survey respondents were assured privacy protection under the U.S. DHHS Health Insurance Portability and Accountability Act of 1996 (ANA, 2013). This study received an Exempt Certification of the Institutional Review Board of the University of California, San Francisco because the data from the survey has been de-identified.

Measures

The ANA HealthyNurse survey. This study used ANA's HealthyNurse health risk appraisal survey data. The survey was designed in collaboration with Pfizer, Inc. for nurses to personally assess their health risk factors and provide real-time feedback in order to educate and support nurse wellness. The web-based survey required approximately 20 minutes to complete. To access the survey, respondents created a username and password and were assured of privacy with HIPAA compliance.

The HealthyNurse survey's 127 questions are divided into three categories: (a) demographics; (b) work environment; and (c) health, safety, and wellness (Appendix A). The survey was developed after a review of the literature and consultation with subject matter experts. A commissioned research group developed the survey's questions and metrics (ANA, 2014). The survey's content validity was determined to be relatively good. Many HealthyNurse survey questions were derived from well-established national surveillance survey systems. Data derived from the survey can be compared with large national datasets, including those of Healthy People 2020, the National Health and Nutrition Examination Survey (NHANES), and the Behavioral Risk Factor Surveillance Survey (BRFSS).

Study Variables

Demographics. The HealthyNurse survey data applicable to this study included demographic variables of age, gender, ethnicity, race, marital status, U.S. and state residency. Nurse employment characteristics included: education, type of nursing license, years as a registered nurse, employment status (i.e. retired, student, actively employed, etc.), and work status (full or part-time work). The survey also asks about national or local membership with the ANA or alternate nursing professional organizations, and workplace affiliation with Magnet,

Pathways to Excellence, National Database of Nursing Quality Indicators or independent nursing quality measures.

Workplace environment. Focused on the nurses' current place of employment, occupational health and safety questions were grouped into eight categories with a detailed description listed below:

Workplace safety climate. Ten questions focus on health and safety by asking the nurses' perspective on how their employer and coworkers maintain a culture of safety. Nurses were asked about safety written guidelines and policies, the availability of safety devices, and inclusion in safety planning. Subjective responses were elicited regarding employers valuing the nurses' health and safety, employees and coworkers looking out for one another, whether nurses are treated with dignity and respect, and are thanked for efforts made. Also asked was whether nurses put their patient's health, safety, and wellness above their own.

Risks. This series consists of twenty-one health and safety hazards in the current work environment that poses a "*significant level of risk*". Among the categories that pose a risk are those affecting physical risks including respiratory and dermatologic from various sources: chemical, infectious agents, blood borne pathogens, needle stick, and those psychological perceived factors of stress or threats. The respondent is asked to "*select all that apply*".

Safe patient handling and mobility (SPHM). An initial question asked nurses whether SPHM applies to their nursing work. If yes, a series of seven questions were asked about SPHM guidelines, policies, assistive technology, and training in the current work environment; nurses' input on the selection and evaluation of assistive technology; if SPHM equipment is used routinely; if they have experienced musculoskeletal pain; and in the event of an injury feel

comfortable reporting their injury. Responses were in Likert-type format: strongly disagree, disagree, neither agree nor disagree, agree, strongly agree, don't know/not sure or N/A.

Sharps. Does the worksite have a sharps safety prevention programs, adequate training in the programs, access and usage of safety devices, and nurses' inclusion in the selection and evaluation of sharps devices were questions asked regarding the risks of a needlestick injury and of contracting a bloodborne pathogen. Addition questions such as in the event of a sharps injury, *does the nurse know how to prevent the risks associated with bloodborne pathogens*, and *does the nurse feel comfortable reporting the injury*? Responses were yes/no and Likert-type format: strongly disagree, disagree, neither agree nor disagree, agree, strongly agree, don't know/not sure or N/A.

Bullying/Violence. Nurses were asked to respond to eight questions regarding verbal and non-verbal aggression from supervisors and/or peers, physical or verbal assault from patients and/or families, concerns about their physical safety, adequate training in bullying and violence, and if they feel comfortable reporting instances of bullying and/or violence. Responses were Likert-type: strongly disagree, disagree, neither agree nor disagree, agree, strongly agree, don't know/not sure or N/A.

Worksite wellness. Seven questions surveyed the state of efforts undertaken by nurses' employers, in this case, hospitals, in creating a healthy workplace. Respondents were asked about the availability and cost of healthy food, whether their facility was smoke-free, and whether fitness, nutrition, and weight management services were accessible and if the employees take advantage of these programs. Responses were Likert-type: strongly disagree, disagree, neither agree nor disagree, agree, strongly agree, don't know/not sure or N/A.

Fatigue/Shiftwork. Fatigue/shiftwork questions were asked about the nurses' usual work schedule, total hours worked per week, length of scheduled work hours, and how often the nurse worked mandatory or unplanned overtime per month with responses ranging from zero to 30 days. The respondents were asked about the type of shift worked (day, evening, night, or rotating) and if they self-scheduled their rotating work hours. Three questions asked about the nurses' perception of their workload: does the nurse arrive early or stay late to get work done, work through breaks, or are assigned a higher workload than comfortable to be answered with one of seven Likert-type responses: strongly disagree, disagree, neither agree nor disagree, agree, strongly agree, don't know/not sure or N/A.

Absent/ Present. Nurses were asked if they felt obligated or were expected to report to work when ill or injured, how many days in the prior year they missed work for a health condition, how many days of work were missed for on-the-job injuries and if they reported the injury. One question asked about the percent of time the nurse felt *present and engaged.* Responses were one Likert-type question as noted above; one for percent of time per workday; two questions for days per year, one for yes or no, and one *select all that apply* question with seven potential responses.

Statistical Analysis

Data analysis was done using the IBM SPSS version 23 statistical software. Descriptive statistics, frequencies and percentages for categorical variables with means and standard deviations for continuous variables, were calculated.

Results

Demographic Characteristics of the Participants

The participants were middle-age (40 years ± 11.8 years) and female (91.8%). Nearly 70% of the nurses were married or in a domestic partnership, and 85% were non-Hispanic White. More RNs in this sample held a baccalaureate degree (45%) compared to those with an associate degree (31%). The hospital nurses who responded to the survey represented 50 U.S. states and the District of Columbia with the largest percentages of nurses residing in Texas (6%), California (6%) and Florida (6%). See Tables 1-3 for social and employment demographics.

About 32% of the participants had five or fewer years nursing work experience and most of the nurses (84%) indicated that they were working full-time for at least 36 hours per week—albeit 37% of respondents worked 41–60 hours per week. Slightly over half (52%) of the nurses indicated that they were working 12-hour shifts—a substantially larger proportion than nurses working 8-hour shifts (20%), or nurses working more than 12 hours per day (17%). Also, about 60% of the nurses worked the day shift and one quarter worked the night shift. The majority of the participants worked in medical–surgical units (23%), critical care units (18%), or cardiology units (12%).

Workplace Environment

Workplace climate. Seventy-five percent of the nurse participants had a favorable perception of their employer and coworkers' *concerns for one another* and, more specifically, around *safety issues*, although a smaller percent of nurses (69%) felt they were *appreciated for their work efforts*, and 65% had *not been included in safety planning*. The majority of nurses (90%) agree or strongly agree that *employees/staff look out for each other's safety and health*. Most RNs (80%) believe their employer *values their health and safety*. Most nurses agree (46%) and strongly agree (36%) they are *treated with dignity and respect*. And 75% of nurses believe they *put their patients' health, safety, and wellness before that of their own* (Table 4).

Workplace risks. Nurses identified the greatest workplace risks are: (a) *workplace stress* (80%); (b) musculoskeletal risk of due to *lifting and repositioning heavy objects* (61%) and the risk of *prolonged standing* (54%); and (c) risk of infectious disease agents by *airborne* (40%), *blood borne pathogens* (45%), or *needlestick injuries* (48%) (Table 5).

Safe patient handling and mobility (SPHM). SPHM programs utilizing assistive technology by trained staff was present in 75% of all facilities. Yet, despite the availability of lifting equipment, less than half of the nurses reported *consistent and routine use when transferring or moving patients* —which may explain why nearly 60% of nurses' state they *experience musculoskeletal pain at work*. Yet, nurses' involvement with the *selection and evaluation of SPHM technology* only constitutes 34% (Table 6).

Sharps. Sharps injury prevention programs are in 85% of the participants' facilities yet, 99% of the nurses' report having *access to sharps safety devices*. On average, 90% or greater of the participants *agree or strongly agree* their facility p*rovides adequate education and training on sharps safety devices*, *use the safety devices all the time*, are *aware of the immediate steps to prevent a bloodborne infection in the case of a sharps injury*, and *are comfortable reporting an injury*. Only 26% of the nurses reported *involvement in the selection and evaluation of sharps devices* (Table 7).

Bullying/Violence. Nurses experience verbal threats or aggression from their peers (56%, but fewer nurses report aggression by an administrator (42%). Greater than half of nurses reported being a victim of workplace violence, yet only 64% are comfortable reporting bullying, whereas 78% will report physical violence (Table 8).

Workplace wellness. Fifty-seven percent of nurses agree that *healthy food choices* (e.g. fruits, vegetables, whole grains) *are available during their work hours,* while 40% feel the *prices*

of these items are comparable to other food choices. Most nurses (91%) report they have a tobacco free workplace. Slightly more than half of the nurses (55%) report they have access to worksite wellness health promotion programs and almost half (49%) participate in worksite wellness activities. Nearly 60% of participants say their worksite provides nutrition and weight management classes and counseling (Table 9).

Fatigue/Shiftwork. The majority of the participants work the day shift (58%) followed by night shift (25%), and nearly 9% of nurses work rotating shifts. Twelve-hour shifts were the most common (52%) with only 20% of nurses working 8-hour shifts. Sixty percent of nurses work 19-40 hours/week. Yet, 37% work 41-60 hours per week and 4 % of reported working more than 61 hours per week (Table 9). Nurses agree (35%) and/or strongly agree (26% on average) they must arrive early, stay late, or work through their break to complete their assignments (Table 10).

Absent/Present. Over half of the nurses (55%) feel obligated to report to work when sick. Most nurses (67%) reported feeling "present" and engaged most of the time (Table 11).

Discussion

This study examined hospital nurses' perceptions of the health and safety conditions in their workplace environment. Overall, hospital nurses had positive perceptions of their employer and felt like they were treated with dignity and respect. The most striking statistics were the health and safety risks of workplace stress, MSD and HAI, which ranked as the top three most serious concerns. While the specifics related to stress were not as obvious as MSD risks such as failing to routinely use SPHM technology and complaints of musculoskeletal pain we might consider multiple factors that affect worker stress. Fatigue may be a factor of stress since nurses were having difficulty getting their work completed in the allotted time, therefore missing

breaks, coming early or staying beyond their scheduled shift, and many working overtime. Although health and safety programs for sharps and SPHM were present in the facilities, only a quarter to a third of the nurses were involved in the planning and selection of the safety technology and equipment

The hospital nurses in this sample were less diverse than national statistics for age, race, ethnicity, and gender than all U.S. nurses (see Table 1; U.S. DHSS, 2010). Generally, a younger population of nurses work in hospitals, as supported in this study, having a mean age of 40 compared to the national average age of 45 of all nurses (US H.H.S.A., 2010). Male nurses in this sample were fewer on average than nationally, reflective of data that shows male nurses tend to move away from the bedside into administrative roles or advanced nurse practice roles, which coincidentally are roles with an average higher pay (Landivar, 2013; Muench, Sindelar, Busch & Buerhaus, 2015). Nurses in this sample were not proportionally represented across the U.S. (Table 1.1, 1.2; BLS, 2013). Populous states with large metropolitan areas are typically more diverse and if underrepresented in this sample would skew the nurse demographics. Other socio demographic factors that may impact the generalizability of the results are that salaries are not universal across the U.S., nor is the cost of living, workplace climates, or State safety regulations— all factors that may affect nurses' perception of their health and workplace environment.

Workplace Environment

Workplace safety climate. Workplace safety climate has been defined as the employee perceptions of the work environment as being personally safe or unsafe (Parker et al., 2003). Perceptions of poor workplace safety climates create undue workplace stressors for employees, increase stress perceptions, and contribute to adverse health outcomes (Danna & Griffin, 1999;

McCaughey et al., 2013, Zohar, 2000). Structural safety programs, policies, training, education, technology for sharps/needlestick prevention, SPHM and workplace wellness programs were in place in most facilities likely due to State regulatory guidelines or national policies. Nurses' perception of an employers' concern for their health contributes to staff's willingness to adopt these safety measures (Gershorn, et al. 2000). Whereas structural safety measures exist many nurses lack active involvement in the planning, selection and evaluation of sharps needle safety devices or lifting equipment but at the same time nurses feel they are thanked for their efforts made at work. Although job involvement improves nurses' individual attitudes, motivation, and worker productivity, the survey responses may be at conflicting if we assume nurses want to be involved and are not, or if nurses do not consider involvement in safety improvements as part of their role (Parker et al., 2003). Yet, the literature has shown lack of involvement equates negatively to creating safe workplaces that support shared governance, and attributes poorly to nurses' agency and sense of empowerment, concepts promoted by the Institute of Medicine's [IOM] Future of Nursing and the ANA Magnet certification (2010; Swanson & Tidwell, 2011). Nurses' perception of an employers' concern for their health also contributes to staff's willingness to adopt organizational safety measures (Gershorn, et al. 2000).

Risks. Nurses reported being at a significant level of risk for three major health and safety factors: workplace stress, musculoskeletal disorders (MSD) from physical injury or strain, and the risk of contracting a hospital acquired infections (HAI). Although the latter two risks, MSD and HAI, are quantifiable, workplace stress is more difficult to diagnose and consequently compensate if an injury occurs. Workplace stress may be attributed to a multitude of factors in the workplace environment and is largely a subjective perspective of emotional strain, which has the potential to manifest as physical symptoms. However, the other two risks: physical injury or

strain and the risk of exposure, contracting an infectious disease result in a physical disability that may be accompanied with secondary psychological consequences. The latter two risks, MSD and HAI are largely addressed under the SPHM and Sharps. In this study, the risks take priority over all other environmental factors, which as either a buffer or a barrier to the perceived risks of workplace stress.

Workplace stress. The Occupational Safety and Health Administration (OSHA) addresses hospital workplace stress as a "potential hazard" attributed to caring for patients who are coping with life-threatening injuries and illnesses, some of who may be demanding, physically violent, or have abusive family members (2015). Workplace stress has been identified as the leading cause of an increase in worker depression and anxiety (Burgard, Elliott, Zivin & House, 2013; Wang, 2005). Workers may experience physical and emotional symptoms of insomnia, anxiety, depression, and irritability, may lead burnout or result in increased use of alcohol, cigarettes and drugs to manage their symptoms (Murphy & Schoenborn, 1987). Increasingly, workplace stress may contribute to bullying and incivility in the workplace. In fact, many U.S. workers at risk for workplace stress do not receive treatment due to a lack of access to mental health services.

The many causes of workplace stress can be attributed to nurses' work. Nurses work in a highly-regulated industry that requires a great deal of attention to detail to prevent errors that may be life threatening. Nurses may be overworked due to understaffing or poor staffing ratios. Nurses labor under time constraints beyond their control and sacrifice meal or rest breaks, which are restorative and counterproductive to their own health (Hurtado, Nelson, Hashimoto & Sorensen, 2015). The hierarchical structure of hospitals and working conditions may also contribute to nurse stress thereby limiting nurses' agency and therefore control over their health.

Healthcare facilities lack structural safeguards, policies or procedures to address workplace stress directly with few exceptions: employee assistance programs (EAP) and organizational change programs. Known buffers to reduce stress include addressing staffing/ workload and leadership/management issues (McVicar, 2003). Reducing nurse patient ratios, taking rest and meal breaks, and creating a healthy work climate including workplace wellness programs can be incorporated to mitigate stressors and improve job satisfaction. Incorporating these measures into health care facilities are not always priorities in for-profit facilities that limit resources to maximize profits or not-for-profit facilities that lack resources. Yet, research has shown an improved return on investment (ROI) when these wellness investments are made (Baiker, Cutler, & Song, 2010; Berry, Mirabito, & Baun, 2010).

Safe patient handling and mobility (SPHM). Debilitating musculoskeletal injuries are ranked at the top of the list for hospital workplace hazards nationally, but second to workplace stress in the ANA survey (OSHA, 2013). Strategies to make the work of nursing less physically demanding such as the implementation of lift teams and assistive SPHM technology have been effective but nurses in this study were not consistently using the technology. These risks, associated with physical bodily injury or strain may be accompanied by lost work or productive time, musculoskeletal pain, role limitations, and the emotional burden of suffering. The consequences of debilitating MSD injuries are related to assisting patients to reposition, transfer, or impede a potential fall are serious injuries for nursing orderlies and assistants who are at a fourfold greater risk of injury than RNs (OSHA, 2013). Repetitive strain from lifting, turning, transferring, and moving patients has a cumulative effect on the body (Zwerdling, 2015). Patients are larger, with records of up to 70% of patients who are obese or overweight (Flegal, Carroll, Kit, & Ogden, 2012).

The conclusions are clear, there is no safe way to manually transfer, reposition, or move patients, whether alone, at risk of compression injuries of the spine, or as a team, which injuries occurs from "sheer forces" (Gallager & Marras, 2012; Marras, Davis, Kirking, & Bertsche, 1999). The ANA recognizes manually lifting and moving patients is an unacceptable practice (2016). Healthcare facilities recognize these risks and hope to reduce MSD by investing in education, training and application in safe patient handling and mobility technology as shown in the data. The use of safe patient technology including transfer boards, blankets, hydraulic lifts and other mechanical devices to carry the burden of the transfer from nurse to machine have been gaining political leverage. Currently, only 11 states have SPHM legislation and a Federal bill, The Nurse and Health Care Worker Protection Act of 2015; H.R. 4266 is in the pipeline (ANA, 2016; NIOSH, 2016). Yet, there are no requirements for hospitals to report these injuries for public record. Implementation of safety improvement projects that fail to obtain "buy-in" from the end users becomes stagnant and fails to serve its purpose (O.S.H.A., 2013).

Sharps/needlestick injuries. The third greatest risk identified by this sample was the risk of contracting an infectious disease or hospital acquired infection (HAI). Whether via airborne or direct contact with blood or body fluids, nurses recognize these risks as part of the job and use universal precautions. Sharps and needlestick injuries create risks of contracting severe or chronic disease by exposure to infectious diseases agents such as blood-borne pathogens such as HIV or hepatitis. Implementation of universal precautions, tuberculosis testing, prescreening staff and patients for infectious disease exposure, and safety technology have all been developed to protect workers from injury and the healthcare facility from liability. But exposures cannot always be prevented when staff are unknowingly exposed to undiagnosed patients, or when an injury occurs due to human error. Creating a safe work environment by implementing known

technologies and educating staff on the proper use of these technologies is only half the battle to support nurses' health. Hospitals have successfully instituted safety technology to 97% of the nurses surveyed. Unlike SPHM technology though, nurses seem to be on board with employing sharps devices, likely because less safe alternatives are not available. And gaining buy-in from staff and including them in selection of safety devices will increase nurses' agency and empower nurses to promote and practice safely.

Bullying and violence. Workplace violence includes physical and verbal assaults that occur in the work setting. Bullying refers to behaviors that are meant to intimidate, insult, demean, or offend and are considered acts of aggression whether done overtly or passively (cite). Often included with acts of bullying include incivility and violence. Uncivil behaviors include rude remarks, sarcasm, gossiping, spreading rumors or simply refusing assistance to a coworker. Adult bullying in the workplace has been termed mobbing and can serve to isolate, intimidate, or otherwise threaten a member of the workgroup that is deficient, yet oft times bullying has been associated with persons who pose a threat to those in power (ANA, 2015). In this study, nurses were more likely to be bullied by peers than administrators and more likely to report physical violence over more subtle forms of violence.

These behaviors violate professional standards of respect and the ANA professional code of ethics and may cause irreparable harm to effecting nurses' self-worth and confidence, which may result in physical symptoms of stress such as headaches, sleep disorders, gastrointestinal distress and contribute to reduced organizational commitment and productivity, to as serious consequences as death from violent assault (National Institute for Occupational Safety and Health [NIOSH], 2002). Repeated, persistent threats may result in post-traumatic stress disorder (Spence Laschinger & Nosko, 2015). Patient safety is at risk when a nurse is distracted due to

her own safety concerns. No federal standard that requires workplace violence protections, but several states have enacted legislation or regulations aimed at preventing workplace violence (ANA, 2016).

Workplace wellness facilities. Progress in developing workplace wellness in the hospital environment may be due to the enactment of the Affordable Care Act's Prevention and Public Health Fund, which was intended to create "cultures of health" by facilitating healthy lifestyles in the workplace (Anderko et al., 2012). The creators of the ACA recognized the high cost of managing chronic disease including depression, anxiety, and diabetes in the aging workforce population, which will make up 20% workforce by 2020 (Anderko et al., 2012; Tossii, 2002). The benefit of a hospital's investment in wellness programs has been known to be cost effective by staving off chronic disease and stress (Baiker, Cutler, & Song, 2010; Berry, Mirabito, & Baun, 2010). Nearly half of the study participants use unspecified workplace health promotion programs, including tobacco cessation, nutrition guidance or physical activities. Yet, it is not known to what extent, when, or how nurses are utilizing wellness services. Tobacco-free workplaces are now common in the US but healthy food choices may only be available to those working the day shift when food service is available to staff. The Healthier Workforce Initiative began in 2002 to improve worker health at the workplace. Health risk appraisals were encouraged to assess worker risk factors leading to implementation of programs to improve physical activity, nutritious eating, preventive screenings and healthy choices (CDC, 2016). Novel wellness services may be needed for nurses who are unable to find time for rest or meal breaks. Off the job, family responsibilities may compete for nurses' leisure time. Further studies on hospital wellness programs designed to support nurses are needed.

Fatigue. Twelve-hour days is the most common work shift of this sample and many nurses report working more than full-time. Although considered a factor of fatigue, this survey did not associate hours worked per day or week with nurse fatigue. The consequences of nurse fatigue may cause nurses to deliver less than optimal care, increase risk for error, decline in short term and working memory, limitations in learning, increased risk taking, mood changes and limited communication skills. In addition, the risks to nurses' health include MSD, sleep disturbances, injuries, gastrointestinal complaints, eating disorders, mood disorders, obesity, diabetes mellitus, metabolic syndrome, cardiovascular disease, cancer, and adverse reproductive outcomes.

Although the ANA's position statement on fatigue acknowledges that both the employer and employee hold joint responsibility to limit nurse fatigue some workplace factors are beyond the control of nurses (Edwards, McMillan, & Fallis, 2013; Geiger-Brown et al., 2016; ANA, 2014). Shift work sleep disorders are common among RNs contributing to similar risks as seen in the fatigue syndrome (Lin, Liao, Chen, & Fan, 2014). Shift work inclusive of greater than 12 hours spent per day on the job may affect driving and be a danger for the nurse or others with similar mental capacities of a person with elevated blood alcohol levels (Geiger-Brown et al., 2012). Contrary to scientific support for short naps, sometimes referred to as power naps, sleeping on break-time has been discouraged as unprofessional within the nursing culture. Hospital employers might improve fatigue issues by adhering to nurse patient ratios, offering safe break respites with nap rooms and limiting nurses from working through breaks or after hours. Legislating these improvements may be necessary before we see implementation.

Absent/Present. Presenteeism is defined as working when ill with acute (flu) or chronic conditions (arthritis, back pain) and, which limits an employee from not working at optimal

capacity (Letvak, Ruhm, & Gupta, 2012). Greater than half of the nurse participants showed up for work when ill. Physical limitations may be related to MSD pain or mental health issues, specifically depression (Lerner & Henke, 2008; Munit, 2007). In fact, anything that interferes work productivity, such as personal issues about childcare concerns, self-care deficits, distractions from co-workers, fatigue, and work demands beyond one's control may account for being present but not working at one's personal level of optimum capacity (Schultz, Chen & Edington, 2009).

In general, people take an average of four sick days per year but when asked, report 57.5 days per year of non-productivity (World Health Organization, 2002). Presenteeism costs businesses ten times more than absenteeism and over the span of a year may amount to 3 months per year in lost productivity (Smith, 2016). Many reasons can be summoned for showing up for work when sick. Some nurses with chronic health issues may have exhausted their paid sick time. They may feel obligated to come to work due to of poor staffing, impacting their colleagues who may have to carry a larger patient assignment. Nurses may wake-up with symptoms of an illness and not have adequate time to report off sick. In some cases, nurses may not be aware of family leave protections or have may have disability claims (like stress) that become burdensome to prove. Also aware of hospital unwritten rules, the liberal use of sick time may be cause for a poor performance evaluation. In all, hospital policies that discourage sick time use may lead to higher levels of presenteeism. Rather than cite an absent nurse, hospital management might be held accountable for providing sick leave coverage. Adequate nurse staffing is associated with fewer complications, adverse events, shorter hospitalizations, lower mortality rates, and greater job satisfaction (Letvak, Grupka & Rimm, 2012).

Strengths and Limitations

This study has several strengths. First, the availability off ANA HealthyNurse health risk appraisal with its sizable convenience sample in order to explore the hospital work environment was a strength of this study. Although the sample was less diverse, it does closely match the sociodemographics of national nurse employment statistics and are an accurate representation of all US hospital nurses therefore the findings are generalizable. Additionally, a strength of the survey was that the questions originated from valid and reliable sources that were beta tested prior to the online SurveyMoney release. In fact, the preliminary data analysis results (executive summary) matched the results obtained in the time span our data was collected and analyzed (ANA, 2014). The eight topics included in the work environment section have been previously identified to be areas of concern.

Several limitations were noted in this study. First, selection bias may be attributed to the participants who may have a greater interest in practicing healthy lifestyles. Secondly, the researcher is constrained by the survey questions when doing a secondary data analysis. For example, regional variations found in healthcare regulations between States, socioeconomic factors, and hospital fiscal operating structures all influence the workplace environment but were not surveyed. Furthermore, we do not know why 40% nurses work overtime. Is it because nurses need to supplement their base pay or because the hospital has a nursing shortage and is unable to staff for the patient census? Third, the application of inclusion and exclusion criteria to hospital nurses based on experiential knowledge could only predict our sample's accuracy to within 99%. In addition to the application of exclusion/inclusion criteria we could not be fully assured we captured all advanced practice or doctoral prepared nurses who may also work at the bedside. For these reason, qualitative follow up studies may be useful. Finally, this study focused on U.S.

hospital nurses' perceived health and their hospital workplace environment the analysis did not consider all the survey questions that were beyond the scope of this paper.

Implications for Future Research

The eight workplace categories identified in the survey are a composite of what are known health and safety barriers or buffers for hospital nurses. Workplace stress was nurses' greatest concern, yet, personal factors that impact stress, workplace autonomy, agency, or control over the environment, and organizational interventions should be examined in greater depth. Workplace wellness has great potential to buffer workplace stress but few studies evaluate how working nurses access or use the services, therefore more research would be beneficial in order to tailor the services to working nurses' unique needs The physical demands of nursing work, such as standing for long hours, lifting, and positioning patients has resulted in musculoskeletal strain and injury, which has not improved with the availability of safety equipment. Further study is needed to examine the barriers to using the SPHM technology. In addition, conflicting reports on benefits of improving muscle strengthening and fitness and decreasing risks to injury should be examined (ANA, 2013; Letvak, 2013).

Novel approaches to improving the working relationships between management and nurses are desirable especially in healthcare systems that have a long history of top-down leadership (Lucian Leape Institute, 2013). Negative aspects of the organizational climate have been known to be related to adverse worker health but more research is needed to understand ways to identify areas of concerns and correction (Gershon et al., 2007). Integrated approaches using both employer and employee approaches should be studied to gain short and long term benefits (OSHA, 2008).

Implications for Policy and Practice

This study helps to understand how nurses interpret the health and safety of their workplace environment. And nurses' negative perceptions of the workplace environment may have long-term consequences for nurses' health and result in less than optimal quality of patient care. Optimistic goals to improve nurses' health by changing the organizational structure of hospitals have been proposed in the nursing literature (cite). Yet, structural change has been difficult without healthcare policies regulating the industry and providing financial incentives for compliance. Attempts to improve nurses' health from the top down only work with carrots and sticks. Instead, as with most change, bottom up grass roots efforts are needed to propel improvements in the workplace environment. Yet, in hospital cultures where nurses' voices are hampered and discouraged and retaliation is very real, nurses tend to stay silent. Collective voices, as in effective labor representation, could be a safeguard against retaliatory measures taken against a single voice.

In this vein, we know that creating community and social networks in the workplace could mitigate or buffer the effects of workplace risks on perceived health. Collective organizations of nurses built around shared goals works due to strength in numbers. Structural supports for safety programs, policies, and training did not occur spontaneously in the workplace. Workers fought hard to have protections in place and succeeded with sharps and needlestick prevention protocols after the HIV/AIDS epidemic in the 1980s when injured nurses challenged workers' compensation laws to be covered for their injuries. Battles were won for sharps prevention and safe patient handling after a spike in injuries were acknowledged, but health and safety risks still under the radar such as incivility, bullying, workplace stress, and fatigue have not been proposed and the few solutions not been operationalized. We are beginning to see State regulations on nurse patient staffing ratios and a bill in the House for safe patient

handling technology but change is slow and nurses continue to be injured, unable to work and uncompensated.

Conclusions

The consequence of maintaining the status quo in the hospital environment means continued risks of workplace stress, musculoskeletal disability and hospital acquired infections for nurses. A multifaceted approach to correct deficiencies is possible when nurses demand changes. Yet, it may take the collective voice of nurses for shared governance to become a reality, creating a shift in decision-making and giving nurses more control of their workplace and ultimately their health and wellbeing.

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Table 4.1

Sociodemographic Characteristics of U.S. Hospital-employed Registered Nurses (N=2730)

Age (years)	Sample n=2725 (%)	National comparison n = 2,824,641 (%)
25 or younger	299 (11.0)	146,881 (5.2)
26-30	468 (17.4)	271,166 (9.6)
31-35	485 (14.6)	310,711 (11.0)
36-40	305 (11.1)	353,080 (12.5)
41-45	319 (11.7)	347,431 (12.3)
46--50	286 (10.4)	409,573 (14.5)
51-55	307 (11.3)	426,521 (15.1)
56-60	244 (8.8)	319,184 (11.3)
61-65	85 (3.1)	166,654 (5.9)
66-70	15 (0.4)	50,844 (1.8)
71 or older	2(0.0)	22,597 (0.8)
Mean	40.0 (*M*) ±11.8 (*SD*)	44.6 (*M*)
Gender	Sample n=2,712 (%)	National comparison n= 2,824,641(%)
Female	2,489 (91.8)	2,567,599 (90.9)
Race/Ethnicity	Sample n=2,869 (%)	National comparison n=2,826,463 (%)
White, non-Hispanic	2,389 (85.2)	2,128,779 (75.4)
African American/Black	176 (6.4)	279,639 (9.9)
Asian	127 (4.7)	234,445 (8.3)
Latino/Hispanic	98 (3.6)	135,582 (4.8)
Other	79 (2.9)	48,018 (1.7)
Marital status	Sample n=2725 (%)	National comparison (%)
Married/domestic partnership	1,870 (68.6)	(74.0)
Divorced-single	221 (8.1)	No data
Never married	582 (21.4)	No data
Separated	30 (1.1)	No data
Widowed	22 (0.8)	No data
Education (N=2730)	Sample n (%)	National comparison n (%)
Diploma (nursing)	73 (3.0)	194,900 (6.9)
Associate (nursing)	767(31.4)	1,070,538 (37.9)
Baccalaureate (nursing)	1,101 (45.0)	1,259,789 (44.6)
Masters (nursing)	210 (8.6)	Not available
Degree in another field	255 (10.4)	Not available

National data source: Health Resources and Services Administration. (2013). The U.S. Nursing Workforce: Trends in Supply and Education, (April), 57. American Community Survey (ACS) (2010)

Table 4.2

U.S. State Residency: ANA HRA Sample compared with National State Workforce

Highest State Residency	**Sample N (%)**	**National N (%)**
Texas	167 (6.1)	186,573 (6.6)
California*	160 (5.9)	274,722 (9.7)
Florida	157 (5.8)	167,476 (5.9)
Georgia*	146 (5.3)	75,976 (2.7)
Utah*	130 (4.8)	18,771 (0.7)
Arizona*	122 (4.5)	50,841 (1.8)
Ohio	121 (4.4)	126,582 (4.4)
New York*	119 (4.4)	196,189 (6.9)
Illinois	102 (3.7)	120,203 (4.3)
Total subset	1225 (44.9)	1,217,333 (43.0)
Total Sample	2730(100.0)	2,824,641 (100.0)

*Under or overrepresented in ANA sample in comparison with national estimates

Health Resources and Services Administration. (2013). The U.S. Nursing Workforce: Trends in Supply and Education, (October), 57.

Table 4.3

Employment Characteristics of the study participants (N = 2,730)

License(s)	**n (%)**
Registered Nurse	2,612 (95.7)
Advanced Practice RN*	18 (0.7)
Nursing Specialty Certification	522 (19.1)
Non-Nursing Specialty Certification	26 (1.0)
Years working as an RN	**n (%)**
< 1	277 (10.2)
1–5	868 (31.9)
6–10	534 (19.6)
11-20 years	399 (14.4)
21-30 years	337 (12.4)
31-40 years	263 (9.7)
Greater than 40 years	45 (1.6)
Employment status (N-2912)	**n (%)**
Semi-retired	15 (0.5)
Actively working in nursing	2,696 (98.8)
Actively working non-nursing	19 (0.7)
Volunteer	19 (0.7)
Work status	n (%)
[a] Full time in nursing	2,269 (84.1)
Part-time in nursing	410 (15.2)
Do you work for an organization that currently?	**n (%)**
Holds Magnet status from the ANA?	744 (27.3)
Holds Pathway to Excellence status	307 (11.2)
Measures nursing quality	1136 (41.6)
Participates National Nursing Quality	789 (28.9)
[b]Hospital work setting	**n (%)**
Cardiology	314 (11.5)
Critical care	482 (17.7)
Emergency	309 (11.3)
Medical-surgical	629 (23.0)
Neonatal	122 (4.5)
Neurology	120 (4.4)
Obstetrics	147 (5.4)
Oncology	209 (7.7)
Orthopedics	144 (5.3)
Pediatrics	188 (6.9)
Peri-op	222 (8.1)

[a] Full-time employment = works 36 hours or more per week

b Select up to 3 that collectively represent where you spend at least 50% of your time

* Advanced Practice—non-Advanced License in Nursing

** Health Resources and Services Administration. (2013). The U.S. Nursing Workforce: Trends in Supply and Education, (April), 57.

Workplace Environment

Table 4.4
Workplace Climate (N=2730)

	N	%	Agree (%)
My employer values my health and safety	**N=2711**		
Strongly Disagree	54	2.0	
Disagree	203	7.5	
Neither Agree nor Disagree	286	10.5	2168 (79.9)
Agree	1229	45.3	
Strongly Agree	939	34.6	
I am familiar with written safety guidelines, policies	**N=2712**		
Strongly Disagree	23	0.8	
Disagree	53	2.0	
Neither Agree nor Disagree	96	3.5	2540 (91.6)
Agree	1330	49.0	
Strongly Agree	1210	44.6	
Safety devices and protective equipment are available to me	**N=2708**		
Strongly Disagree	29	1.1	
Disagree	64	2.4	
Neither Agree nor Disagree	102	3.8	4073 (92.4)
Agree	1148	42.4	
Strongly Agree	1365	50.4	
Reporting of injuries and health concerns is encouraged	**N=2706**		
Strongly Disagree	34	1.3	
Disagree	97	3.6	
Neither Agree nor Disagree	189	7.0	2386 (88.2)
Agree	953	35.2	
Strongly Agree	1433	53.0	
Unsafe conditions and other hazards are quickly identified and corrected	**N=2700**		
Strongly Disagree	43	1.6	
Disagree	225	8.3	
Neither Agree nor Disagree	324	12.0	2108 (78.0)
Agree	1189	44.0	
Strongly Agree	919	34.0	
Employees/staff members look out for each other's safety and health	**N=2704**		
Strongly Disagree	30	1.1	
Disagree	74	2.7	
Neither Agree nor Disagree	207	7.7	2393 (88.5)
Agree	1150	42.5	
Strongly Agree	1243	46.0	
I have an opportunity to be involved in safety planning.	**N=2647**		
Strongly Disagree	91	3.4	
Disagree	350	13.2	
Neither Agree nor Disagree	492	18.6	1714 (64.7)
Agree	975	36.8	
Strongly Agree	739	27.9	

I put my patients' health, safety, and wellness before that of my own	**N=2696**		
Strongly Disagree	51	1.9	
Disagree	219	8.1	
Neither Agree nor Disagree	404	15.0	2022 (75.0)
Agree	902	33.5	
Strongly Agree	1120	41.5	
I am treated with dignity and respect	**N=2710**		
Strongly Disagree	62	2.3	
Disagree	207	7.6	
Neither Agree nor Disagree	353	13.0	2088 (77.1)
Agree	1249	46.1	
Strongly Agree	839	31.0	
I am recognized and thanked for the efforts I make at work	**N=2712**		
Strongly Disagree	112	4.1	
Disagree	323	11.9	
Neither Agree nor Disagree	419	15.4	1858 (68.5)
Agree	1111	41.0	
Strongly Agree	747	27.5	

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Table 4.5
Workplace Risks (select all that apply) (N=2730)

In my current work environment, I am at a significant level of risk for the following health and safety hazards: (Select all that apply)	**n (%)**
Workplace Stress	2182 (79.9)
Lifting/repositioning heavy objects	1667 (61.1)
Prolonged standing	1470 (53.8)
Needlesticks or sharps injuries	1295 (47.4)
Blood-borne pathogens	1229 (45.0)
Infectious diseases agents (e.g. tuberculosis)	1094 (40.1)
Slips trips and falls	903 (33.1)
Violence at work (e.g. assaults, threats, etc.)	678 (24.8)
Noise level	583 (21.4)
Debilitating musculoskeletal injury	522 (19.1)
Latex allergens (e.g. from gloves)	471 (17.3)
High level disinfectants (e.g. glutaraldehyde)	451 (16.5)
Hazardous drugs (including neoplastic agents)	428 (15.7)
Ionizing radiation (e.g. X-rays, gamma rays, etc.)	423 (15.5)
I have had a work-related injury resulting in medical treatment, lost time from work, or restricted work activities	385 (14.1)
Poor indoor air quality (e.g. molds, cigarette smoke, vehicle exhaust, etc.)	343 (12.6)
Chemical agents in general (e.g. acids, caustics, solvents)	336 (12.3)
Sterilants (e.g. ethylene oxide, hydrogen peroxide)	279 (10.2)
Anesthetic gases	184 (6.7)
Smoke from lasers and electrosurgery devices	167 (6.1)
Non-ionizing radiation (e.g. U.V. microwaves, radio-frequency, magnetic/electric fields, etc.)	163 (6.0)

Table 4.6
Safe patient handling and mobility (SPHM) (N=2730)

	n (%)	Agree (%)
In my current work environment, SPHM is applicable to my job.	2429 (89.7)	
My facility has a SPHM program.	**N=2299**	
Strongly Disagree	70 (3.0)	
Disagree	236 (10.3)	
Neither Agree Nor Disagree	246 (10.7)	1747 (76.0)
Agree	1049 (45.6)	
Strongly Agree	698 (30.4)	
I am involved in the selection and evaluation on SPHM equipment.	**N=2333**	
Strongly Disagree	226 (9.7)	
Disagree	840 (36.0)	
Neither Agree Nor Disagree	481(20.6)	786 (33.6)
Agree	512 (21.9)	
Strongly Agree	274 (11.7)	
I have access to assistive technology / aid in moving patients.	**N=2397**	
Strongly Disagree	76 (3.2)	
Disagree	319 (13.3)	
Neither Agree Nor Disagree	199 (8.3)	1803 (74.2)
Agree	1143 (47.7)	
Strongly Agree	660 (27.5)	
Received adequate education and training in use of equipment.	**N=2396**	
Strongly Disagree	76 (3.2)	
Disagree	343 (14.3)	
Neither Agree Nor Disagree	330 (13.8)	1647 (68.7)
Agree	1057 (44.1)	
Strongly Agree	590 (24.6)	
I use the SPHM technology every time I transfer or move a patient	**N=2357**	
Strongly Disagree	178 (7.6)	
Disagree	675 (28.6)	
Neither Agree Nor Disagree	386 (16.4)	1118 (47.4)
Agree	733 (31.1)	
Strongly Agree	385 (16.3)	
I experience musculoskeletal pain at work.	**N=2412**	
Strongly Disagree	129 (5.3)	
Disagree	520 (21.6)	
Neither Agree Nor Disagree	352 (14.6)	1411 (58.5)
Agree	971 (40.3)	
Strongly Agree	440 (18.2)	
In the event of musculoskeletal injury, I would be comfortable in reporting my injury.	**N= 2412**	
Strongly Disagree	50 (2.1)	
Disagree	288 (11.9)	
Neither Agree Nor Disagree	278 (11.5)	1796 (74.4)
Agree	992 (41.1)	
Strongly Agree	804 (33.3)	

Table 4.7
Sharps (N=2730)

In my current environment…	n (%)	**Agree (%)**
Sharp/needlestick prevention is applicable to my current duties	2528 (93.6)	
My facility has a sharps injury prevention program.	**N=2325**	
Strongly Disagree	27 (1.2)	
Disagree	123 (5.3)	
Neither Agree Nor Disagree	193 (8.3)	1982 (84.3)
Agree	1090 (46.9)	
Strongly Agree	892 (38.4)	
I am involved in the selection and evaluation of sharps safety devices.	**N=2423**	
Strongly Disagree	287 (11.8)	
Disagree	1023(42.2)	
Neither Agree Nor Disagree	474 (19.6)	639 (25.9)
Agree	404 (16.7)	
Strongly Agree	235 (9.7)	
I have access to sharps safety devices.	**N=2533**	
Strongly Disagree	11 (0.4)	
Disagree	28 (1.1)	2455 (97.0)
Neither Agree Nor Disagree	39 (1.5)	
Agree	1240 (49.0)	
Strongly Agree	1215 (48.0)	
I have received adequate education and training on my sharps safety protocols and policies.	**N=2534**	
Strongly Disagree	16 (0.6)	
Disagree	124 (4.9)	
Neither Agree Nor Disagree	148 (5.8)	2246 (88.6)
Agree	1219 (48.1)	
Strongly Agree	1027 (40.5)	
I use sharps safety devices all the time.	**N=2530**	
Strongly Disagree	14 (0.6)	
Disagree	114 (4.5)	
Neither Agree Nor Disagree	83 (3.3)	2319 (91.7)
Agree	1029 (40.7)	
Strongly Agree	1290 (51.0)	
In the event of a sharps injury, I am aware of the immediate steps I must take to reduce my risk of contracting bloodborne pathogens infectious diseases.	**N=2531**	
Strongly Disagree	11 (0.4)	
Disagree	66 (2.6)	
Neither Agree Nor Disagree	65 (2.6)	2389 (94.3)
Agree	1082 (42.7)	
Strongly Agree	1307 (51.6)	
In the event of a sharps injury, I would be comfortable reporting my injury.	**N=2530**	
Strongly Disagree	16 (0.6)	
Disagree	53 (2.1)	2388 (94.4)
Neither Agree Nor Disagree	73 (2.9)	
Agree	931 (36.8)	
Strongly Agree	1457 (57.6)	

Table 4.8
Bullying/ Violence (N=2730)

	n (%)	Agree (%)
I have experienced verbal or non-verbal aggression from a person in a higher level of authority.		
Strongly Disagree	472 (17.5)	
Disagree	876 (32.5)	
Neither agree Nor Disagree	211 (7.8)	1136 (42.1)
Agree	758 (28.1)	
Strongly Agree	378 (14.0)	
I have experienced verbal or non-verbal aggression from peer.		
Strongly Disagree	347 (12.9)	
Disagree	660 (24.5)	
Neither agree Nor Disagree	192 (7.1)	1494 (55.5)
Agree	1058 (39.3)	
Strongly Agree	436 (16.2)	
I am worried for my physical safety.		
Strongly Disagree	821 (30.8)	
Disagree	1210 (45.4)	
Neither agree Nor Disagree	357 (13.4)	279 (10.4)
Agree	225 (8.4)	
Strongly Agree	54 (2.0)	
I have been physically assaulted by a patient or a family member of a patient while at work.		
Strongly Disagree	724 (27.0)	
Disagree	884 (33.0)	
Neither agree Nor Disagree	134 (5.0)	938 (35.0)
Agree	651 (24.3)	
Strongly Agree	287 (10.7)	
I have been verbally and/or physically assaulted by a patient or a family member of a patient.		
Strongly Disagree	457 (17.1)	
Disagree	587 (21.9)	
Neither agree Nor Disagree	138 (5.2)	1495 (55.9)
Agree	995 (37.2)	
Strongly Agree	500 (18.7)	
I have received adequate education and training on bullying and violence prevention protocols and policies.		
Strongly Disagree	138 (5.1)	
Disagree	527 (19.6)	
Neither agree Nor Disagree	448 (16.7)	1572 (58.5)
Agree	1061 (39.5)	
Strongly Agree	511 (19.0)	
I am comfortable reporting instances of bullying.		
Strongly Disagree	133 (5.0)	
Disagree	464 (17.4)	
Neither agree Nor Disagree	378 (14.1)	1698 (63.6)
Agree	1052 (39.4)	
Strongly Agree	646 (24.2)	
I am comfortable reporting instances of workplace violence.		
Strongly Disagree	78 (2.9)	
Disagree	241 (9.0)	
Neither agree Nor Disagree	275 (10.3)	1383 (77.9)
Agree	1206 (45.1)	
Strongly Agree	877 (32.8)	

Table 4.9
Workplace Wellness (N=2730)

	N (%)	Agree (%)
Healthy food choices are available during my work hours.		
Strongly Disagree	371 (13.9)	
Disagree	519 (19.4)	
Neither Agree Nor Disagree	267 (10.0)	1620 (56.8)
Agree	1070 (40.0)	
Strongly Agree	450 (16.8)	
The price of healthy food choices is comparable to the price of other food choices.		
Strongly Disagree	385 (15.1)	
Disagree	792 (31.0)	
Neither Agree Nor Disagree	356 (13.9)	1024 (39.9)
Agree	746 (29.2)	
Strongly Agree	278 (10.9)	
My work environment is tobacco free.		
Strongly Disagree	51 (1.9)	
Disagree	128 (4.7)	
Neither Agree Nor Disagree	60 (2.2)	2461 (91.1)
Agree	1029 (38.1)	
Strongly Agree	1432 (53.0)	
I have access to worksite wellness health promotion programs.		
Strongly Disagree	132 (5.0)	
Disagree	283 (10.8)	
Neither Agree Nor Disagree	211 (8.0)	2002 (76.2)
Agree	1098(41.8)	
Strongly Agree	904 (34.4)	
I participate in employer sponsored health promotion activities.		
Strongly Disagree	173 (6.7)	
Disagree	761 (29.3)	
Neither Agree Nor Disagree	386 (14.9)	1275 (49.2)
Agree	700 (27.0)	
Strongly Agree	575 (22.2)	
I have access to employer-based exercise facilities and programs.		
Strongly Disagree	370 (14.3)	
Disagree	591 (22.8)	
Neither Agree Nor Disagree	218 (8.4)	1408 (54.5)
Agree	832 (32.2)	
Strongly Agree	576 (22.3)	
My worksite offers nutrition and weight management classes and counseling.		
Strongly Disagree	261 (10.8)	
Disagree	453 (18.7)	
Neither Agree Nor Disagree	302 (12.4)	1411 (58.1)
Agree	906 (37.3)	
Strongly Agree	505 (20.8)	

Table 4.10
Fatigue/Shiftwork (N=2730)

	n (%)
At my main nursing job, I usually work this schedule:	
Day	1548 (57.9)
Evening	108 (4.0)
Night	677 (25.3)
Rotating	239 (8.9)
Irregular arranged by employee	38 (1.4)
Irregular arranged by employer	65 (2.4)
Combining all my paid employment I typically work this many hours per week:	
19-40	1615 (59.6)
41-60	988 (36.5)
>61	105 (3.8)
At my primary nursing employment, the usual length of my scheduled work hours are:	
Less than 8 hours	21 (0.8)
Eight hours	537(19.9)
Ten hours	303(11.2)
Twelve hours	1390 (51.6)
More than 12 hours	445 (16.5)
In one month, I work mandatory or unplanned overtime this many times:	
0	1086 (40.1)
1	405 (15.0)
2	418 (15.4)
3	168 (6.2)
4	223 (8.2)
5	100 (3.7)
--------	------
6-10	188 (7.0)
11-15	57 (2.1)
16-20	36 (1.2)
Greater than 20	26 (0.9)
In my current work environment…	
I often arrive early and stay late to get my work done.	**N=2714**
Strongly Disagree	147 (5.4)
Disagree	640 (23.6)
Neither Agree Nor Disagree	317 (11.7)
Agree	968 (35.7)
Strongly Agree	642 (23.7)
I often have to work through my breaks to complete my assigned workload.	**N=2723**
Strongly Disagree	142 (5.3)
Disagree	578 (21.4)
Neither Agree Nor Disagree	299 (11.1)
Agree	932 (34.5)
Strongly Agree	747 (27.7)
I am often assigned a higher workload than I am comfortable with.	**N=2720**
Strongly Disagree	201 (7.5)
Disagree	877 (32.7)
Neither Agree Nor Disagree	603 (22.4)
Agree	594 (22.1)
Strongly Agree	411 (15.3)

Table 4.11
Absent/Present (N=2730)

	n (%)
I feel obligated or that I am expected to come to work even when I feel sick or am injured.	**N=2337**
Strongly Disagree	177 (7.6)
Disagree	572 (24.5)
Neither Agree Nor Disagree	323 (13.8)
Agree	755 (32.3)
Strongly Agree	510 (21.8)
During a typical workday, I feel "present" and engaged this percentage of the time.	**N=2722**
39% or less	53 (1.9)
40-59%	192 (7.1)
60-79%	663 (24.4)
80-100%	1814 (66.6)
In the last year, I have missed this many days of work due to illness or other health condition:	**N=2718**
0-5	241 (88.7)
6-10	184 (6.7)
11-15	41 (1.5)
16-20	20 (0.7)
>20	63 (2.2)
In the last year, I have missed this many days of work due to work-related injury.	**N=2724**
0	1086 (40.1)
1-5	1314 (48.5)
6-10	15 (0.5)
11-15	7 (0.2)
16-20	1 (0.0)
>20	29 (1.0)
I reported the injury. Yes	166 (76.5)
I didn't report the injury because … (select all that apply)	
There was no one to cover work for me.	6 (0.2)
There was no process for reporting injuries or getting care.	1(0.0)
I was afraid of retribution.	12 (0.4)
I reported it to my supervisor but was not encouraged to fill out the report and seek treatment.	4 (0.1)
I didn't think the injury was significant.	23 (0.8)
I was too busy.	13 (0.5)
Other	11 (0.4)

Chapter 5

Summary and Conclusions

Chapter 5

Summary and Conclusions

The main purpose of this dissertation was to examine nurses' healthy lifestyles, perceived health and the hospital workplace environment. Taking a socioecological perspective that health is not just the absence of disease but the synergy of ones' physical, mental and social environment, an examination of the nurses' perception of the hospital workplace health and safety environment was essential in understanding the contextual factors influencing nurses' health and lifestyle practices. Using aggregate data from the ANA HealthyNurse health risk appraisal this study has been able to describe the lifestyles, work, perceived and actual health of hospital nurses. In addition, a systematic review of the literature with the aims to describe nurses' lifestyle practices—specifically, physical activity and diet and the relationship between lifestyle practices and health outcomes (CVD risks and HRQOL) provided a foundation to understand the health consequences of healthy lifestyles. Finally, by comparing nurses' lifestyles and perceived health with national datasets (BFRSS, NHS, NHIS), helped to elucidate areas of concern to improve lifestyles and the workplace environment to support nurses' health.

Key Findings

The first aim of the dissertation research project was to review and synthesize previous research on nurses' lifestyle practices of physical activity and diet and health-related outcomes. A systematic review of thirteen studies found that many nurses do not practice healthy lifestyles and that these unhealthy lifestyle practices increased their risk for CVD and diminished their HRQOL. In 12 of the 13 studies that used NHS data 60-74% of nurses did not engage in adequate physical activity and 53-61% did not consume a healthy diet (Bazzano et al., 2008; Chiuve et al., 2008; Forman et al., 2009). Nurses fared poorer than U.S. adults for achieving

enough physical activity but on average had a healthier diet. Adequate physical activity contributes to better HRQOL and a healthy diet reduces CVD risks (HTN, diabetes mellitus, obesity, stroke). Fewer than 5% of these nurses engaged in five combined healthy lifestyle behaviors—a lifestyle pattern associated with diminished HRQOL, and a high risk for developing cardiovascular clinical risk factors (e.g., hypertension, obesity, and stroke; Chiuve et al., 2008; Chomistek et al., 2015; Forman et al., 2009; Sotos-Prieto et al., 2016).

The second aim of the research project was to describe the lifestyles of the HealthyNurse participants: physical activity, diet, sleep, cigarette and alcohol use and their perceived health. Approximately half of the nurses met the physical activity recommendations of aerobic and muscle strength training and were better on average than nurses from the NHS-related studies and adult women surveyed in the BFRSS and NHIS. The participants' dietary practices were much poorer than NHS samples of nurses and U.S. women for consuming at least five fruits and vegetables a day. Regarding recommended sleep habits of 7-9 hours daily, the nurses in the HealthyNurse survey had less sleep on average than most adult women but on par with adults living in homes with young children. Concurrent with lifestyle trends, more than 90% of the nurses did not smoke or use alcohol excessively — better than U.S. adults.

In addition, an examination of the four factors of perceived health (self-rated health, role limitations, mental health, and emotional support) most nurses in this sample rated their health as good to excellent, on average less than other adult females of their age and had more days than other women their age for role limitations and mental health. The greatest mental health deficit reported was fatigue, whereas nurses experience fatigue 5 days every two weeks, and have difficulty sleeping or eating (either too much or too little) an average of 4 days every two weeks. Nurses overall get the emotional support they need but could not be compared with other studies

due to discrepancies in the survey response measures. Factoring in health diagnoses, we learned allergies were most prevalent among 29% of nurses, followed by low back pain (22%), migraines (18%), and hypertension (15%). For mental health, 18% of nurses have been diagnosed with depression and 15% diagnosed with anxiety. Since we were comparing working nurses the health diagnoses that may be debilitating were low for this sample (i.e.. stroke).

The third aim of the research project was to evaluate the workplace health and safety concerns of hospital nurses. Of the survey's eight identified categories, workplace risks, specifically workplace stress, musculoskeletal disability (MSD), and hospital-acquired infections (HAI) surpass all other workplace concerns. The remaining seven categories: workplace climate, SPHM, sharps, bullying/violence, workplace wellness, fatigue, and presenteeism may be viewed as barriers or buffers to nurses' health. Each of the health and safety categories could act as a two-edged sword that have the potential to benefit workers or provide a barrier to stress, MSD, and HAI in which either increases risks for injury, deepens stress, or when implemented successfully have the potential to improve worker health and safety. The survey results can be used as a barometer to discover what is working and what concerns may need alternative solutions.

Hospitals have been largely successful at implementing (mandated) programs to address serious risks to health and safety—chiefly, infectious disease controls, sharps/needlestick programs and safe lifting measures (SPHM) that have long been known to be troubling areas for healthcare. Although, when safety programs are in effect few nurses are involved with the planning, selection, or implementation of safety measures. But less obvious are those worker concerns that do not have a clear policy or program such as bullying/violence, nurse fatigue and presenteeism. Greater than half of the participants experienced bullying and violence from their

peers and patients' while slightly fewer experienced bullying from an administrator. Of those affected not all will report the event. While there are efforts to create workplace standards for civility, many nurses and management tolerate the offenses as part of the job or in the name of customer service. Fatigue, measured by hours worked and workload, showed many nurses are working more than 40 hours per week, 12-hour shifts, and acknowledge worker overload yet, over half come to work when sick.

Finally, nurses report workplace wellness facilities, a potential buffer to health risks, as being accessed by half of the sample but the survey doesn't elaborate on this category. Although hospitals have succeeded in being smoke free they may not be free of unhealthy foods such as sodas and snacks found in vending machines and possibly the only "food" available for nurses working evening and night shifts. One coincidence noted, may be that the same percent of nurses who work daytime shifts also agree their workplace offers healthy food choices, lending one to suspect that food service is offered only in the daytime work hours.

However, nearly three-fourths of the nurses had favorable perceptions of their employer, saying they are treated with dignity and respect and felt they were appreciated for their efforts. As optimistic as these nurses are regarding their workplace it seems they are not in the driver's seat, reporting low levels of involvement in safety measures. Recommendations for shared governance models as in Magnet facilities may not be not universally applied. Noting that hazards are identified after an injury occurs, those who are most affected, whose health is at risk, should be involved in the safety planning. Nurses as major stakeholders should be involved in any effort to improve the workplace environment.

This research points to workplace stress as the greatest risk factor for nurses. Although healthy lifestyles may mitigate the effects of nurses' stress, the workplace environment and

organizational structure may be a greater hindrance to nurses' health. The theoretical model proposed using Bandura's SCT and socioecologic perspective of health validates the importance of the bidirectional interactions between health, lifestyles and the environment. Reinforcing nurses' health and lifestyles may strengthen nurses to gain control over their environment but if that fails, as it obviously has, the workplace environment is suspect and changes to the structure are in order. Using the process improvement model as a guide, further research and models for improvement can be implemented.

Implications and Recommendations for Research Policy and Practice

The findings of this dissertation research project have several implications for hospital nurses' lifestyles, health, and the workplace environment. The results of the survey provide a rich source of critical challenges for today's hospital nurses along with opportunities to improve the workplace, beginning with small quality improvement projects at the unit level (Langley et al., 2009). The greatest obstacles to improvements may be systemic organizational factors that limit hospital nurse involvement as reported by nurses in this survey, which thus, limits their abilities to voice their concerns and create improvements for their workplace health.. Why were nurses excluded from safety planning or the selection of safety technology? The survey doesn't ask those questions— it may be that safety management is a role relegated to an advanced practice or occupational health nurse. But a concern for nurses, primarily female, lower paid and lack administrative power, is that nurses may not be allowed a voice at the decision-making table. Larger system wide models such as ANA's Magnet model, Jean Watson's Theory of Human Caring Caritas model, and Lean models are available for implementation but there is a hefty investment is beyond the scope of many hospitals and thus far no one model has been

adopted universally (American Nurses Credentialing Center, 2017; Savary & Crawford-Mason, 2006; Watson, J, 2008).

Improvement of nurses' lifestyles may include workplace wellness services in the hospital environment as a start. The few studies that have documented wellness interventions involving nurses have been successful. Yet, implementation has not been as successful and the continuation of these models depends on scarce funding for services. Simple measures like allowing nurses to take the rest and meal breaks that they are entitled to, providing safe, quiet rest spaces for sleep or meditation, around the clock food service, gathering places for nurses to share stories, create community, or debrief, or nursing councils for quality improvement and staff forums can all act as buffers to workplace stress.

Alternate healthcare models have been proposed and tested to improve nurses' lifestyles, perceived health and the workplace environment translate into improved satisfaction from nurses and patients, fewer errors, and less injuries. Nursing models and guidelines for transformative care such as Magnet hospitals that support shared governance models, Watson's Theory of Human Caring, and the Lean model based on stories like *The Nun and the Bureaucrat* are available but nursing leadership and hospital administration are the decision makers and aren't as motivated to make change when it does not affect them personally. Thus, nurses must collectively work together to demand change. Nursing collective bargaining groups have been instrumental in getting safe patient ratios, sharps protection, living wages, and many other worker protections. Nurse involvement is critical, but since nurses are working full time or overtime they have little freedom to make the necessary changes. Nurses have typically been tolerant of conditions they feel they have no control over. Some nurses fear speaking out due to

retaliatory backlash, but collective voices can affect change, as many voices enhance the strengths of diversity in communication.

Another obstacle to the universal adoption of successful workplace programs is a lack of cohesion between U.S. hospitals. The U.S. healthcare system is a patchwork of public and private entities, many operating with a for-profit motive. Traditional healthcare models have a top down leadership model, which bars the engagement of all staff in the interest of maximum profit. The art and science of nursing has been diluted in the capitalist healthcare model diminishing the role of a nurse a to job and a not profession.

Strengths

The secondary data analysis of the ANA HealthyNurse health risk appraisal has strengths based on the design, sample size and critical material collected and analyzed. First, the large sample size, even after excluding nurses who were students, retired, and not working as hospital nurses was an asset because it denotes a large diversity of opinions and therefore displays a more accurate picture of the national nursing population. Moreover, the data was collected and presented in files easy to access and analyze using standard statistics tools. Furthermore, the accessibility and ease of use of the online survey tool using the popular SurveyMonkey, and assurance of privacy may have been factors in achieving a large sample size. The ANA was active in advertising the benefits of taking the survey for individual nurses in receiving a personal health evaluation. The survey itself was beta tested after its creation using focus groups, subject experts and literature reviews. The questions were reportedly derived from previously tested and validated tools. Lastly, because the sample closely matched the sociodemographics of national nurse employment statistics it is an accurate representation of all US hospital nurses and the findings are generalizable.

Limitations

The study has several limitations. First, although the survey content validity was reported, the reliability was not. The ANA employed a research team to develop the questions and metrics, and although many of the questions came from well-established national surveys there was no discussion about the consistency of the measures. Furthermore, it is not known if the survey was tested on the target population sampled (nursing students, retirees, and working nurses).

Second, the study used a cross sectional design, thus the data provided by the participants is a snapshot of real-time data therefore, the same outcomes may not be consistent over time. Third, the data was based on the participants' self-report. Self-report limitations may include faulty participant recall and social desirability bias. Fourth, the study used a convenience sample (i.e., nurses participate in the survey via self-selection) and non-probability sampling may not be generalizable to the larger sample of U.S. hospital nurses. Those who chose to participate in the survey may have had a greater interest in the topics covered in the survey. This sample was less experienced and younger than all US hospital nurses. The RNs who took the time and effort to register then complete the twenty-minute online survey were relative novices in their nursing career. The sample of hospital nurses was 37% of all ANA HealthyNurse participants which begs the question if the hospital workplace environment health and risk factors were appropriately surveyed by non-hospital nurses. Furthermore, the ability to take an online survey was limited to nurses who have access to a computer and to the Internet and who are comfortable using technology.

Lastly, other limitations worthy of consideration are environmental factors which were not included in the survey. For example, the survey isn't specific about the size of hospitals,

ownership, and nurse salaries. The quantitative study design may not explain fully why nurses are experiencing stress or why nurses work overtime or why nurses go to work when sick but a qualitative study may help to answer these questions. Along this thread, using secondary data limits the researcher to the available data which may not fully explain the answers to many of the questions.

Summary

This study reinforces what may already be known among US hospital nurses, that although nursing practice involves the maintenance and support of the health of others, nurses are not maintaining their own health by practicing healthy lifestyles. This study highlights the importance of a healthy workplace as a means of supporting nurses' health and ultimately patients' health. In recognition of the socioecology of health and healthy workplaces, it is time for nurses to make their own health and safety a priority and collectively work together.

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Appendix

Survey Questions

HRA Healthy Nurse DEV

Initial Screening DEV

*Are you a:

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HRA Healthy Nurse DEV

Section 1: Demographics

This section asks general questions about you, your education, licensure and nursing practice/employment.

What is your age?

What is your gender?

Are you Hispanic or Latino?

The question above is about ethnicity, not race. No matter what you selected above, please continue to answer the following, if applicable, by selecting one or more of the choices to indicate what you consider your race to be.

Which one or more of the following would you say is your race?
(Select all that apply)

- ☐ White
- ☐ Black or African-American
- ☐ Asian
- ☐ Hispanic or Latino
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ American Indian or Alaska Native
- ☐ Other
- ☐ Don't know/Not sure

What is your current marital status?

Where do you live?

State:

Do you live outside the continental United States?

- ○ Outside of the United States
- ○ APO/FPO AE
- ○ APO/FPO AA
- ○ APO/FPO AP
- ○ Not Applicable

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Nurse Employment

What is your highest level of education?

What type of license do you currently hold?
(Select all that apply)

- ☐ Currently a Student Nurse (No License)
- ☐ Registered Nurse
- ☐ Advanced Practice RN
- ☐ Nursing Specialty Certification
- ☐ Non-nursing Specialty Certification
- ☐ Lapsed or not current

I am a member of the American Nurses Association.

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I am a member of one of the following nursing organizations:

(Select all that apply)

- ☐ Alabama State Nurses Association
- ☐ American Association of Heart Failure Nurse
- ☐ Association for Radiologic & Imaging Nursing
- ☐ Association of Occupational Health Professionals in Healthcare
- ☐ Arizona Nurses Association
- ☐ Arkansas Nurses Association
- ☐ ANA/California
- ☐ Colorado Nurses Association
- ☐ Connecticut Nurses Association
- ☐ Delaware Nurses Association
- ☐ Florida Nurses Association
- ☐ Georgia Nurses Association
- ☐ Guam Nurses Association
- ☐ Idaho Nurses Association
- ☐ ANA-Illinois
- ☐ Indiana State Nurses Association
- ☐ International Association of Forensic Nurses
- ☐ Iowa Nurses Association
- ☐ Kansas State Nurses Association
- ☐ Kentucky Nurses Association
- ☐ Louisiana State Nurses Association
- ☐ ANA-Maine
- ☐ Maryland Nurses Association
- ☐ ANA Massachusetts
- ☐ ANA Michigan
- ☐ Minnesota Organization of Registered Nurses
- ☐ Mississippi Nurses Association
- ☐ National Association of Nurse Practitioners for Women's Health
- ☐ National Organization for Associate Degree Nursing
- ☐ Nebraska Nurses Association
- ☐ Nevada Nurses Association
- ☐ New Hampshire Nurses Association
- ☐ New Jersey State Nurses Association
- ☐ New Mexico Nurses Association
- ☐ ANA-New York
- ☐ North Carolina Nurses Association
- ☐ North Dakota Nurses Association
- ☐ Ohio Nurses Association
- ☐ Oklahoma Nurses Association
- ☐ Oregon Nurses Association
- ☐ Pennsylvania State Nurses Association
- ☐ Rhode Island State Nurses Association
- ☐ South Carolina Nurses Association
- ☐ South Dakota Nurses Association
- ☐ Tennessee Nurses Association
- ☐ Texas Nurses Association
- ☐ Utah Nurses Association
- ☐ Vermont State Nurses Association
- ☐ Virgin Islands State Nurses Association
- ☐ Virginia Nurses Association
- ☐ Washington State Nurses Association
- ☐ West Virginia Nurses Association
- ☐ Wisconsin Nurses Association
- ☐ Wyoming Nurses Association
- ☐ Individual Member Division
- ☐ Academy of Medical-Surgical Nurses
- ☐ Academy of Neonatal Nursing, LLC
- ☐ American Academy of Ambulatory Care Nursing
- ☐ American Association of Colleges of Nursing
- ☐ American Association of Critical-Care Nurses
- ☐ American Association of Diabetes Educators
- ☐ American Association of Neuroscience Nurses
- ☐ American Association of Nurse Anesthetists
- ☐ American Association of Occupational Health Nurses, Inc.
- ☐ American College of Nurse-Midwives
- ☐ American Holistic Nurses Association
- ☐ American Nephrology Nurses' Association
- ☐ American Psychiatric Nurses Association
- ☐ Association of Nurses in AIDS Care
- ☐ Association of Nursing Professional Development
- ☐ Association of periOperative Registered Nurses
- ☐ Association of Rehabilitation Nurses
- ☐ Association of Women's Health, Obstetric & Neonatal Nurses
- ☐ Emergency Nurses Association
- ☐ Hospice and Palliative Nurses Association
- ☐ Infusion Nurses Society
- ☐ National Association of Clinical Nurse Specialists
- ☐ National Association of Neonatal Nurses

- [ ] Missouri Nurses Association
- [ ] Montana Nurses Association
- [ ] National Association of Orthopedic Nurses
- [ ] National Association of School Nurses
- [ ] Nurses Organization of Veterans Affairs
- [ ] Oncology Nursing Society
- [ ] Preventive Cardiovascular Nurses Association
- [ ] Wound, Ostomy, Continence Nurses Society
- [ ] Other

What is your employment status?
(Select all that apply)

- [ ] Semi-retired
- [ ] Unemployed/Actively searching for work
- [ ] Student
- [ ] Actively employed in nursing (including nursing academia/administration)
- [ ] Actively employed in a field other than nursing
- [ ] Volunteer in nursing
- [ ] Unemployed
- [ ] Retired
- [ ] Other

Indicate your work status.

Do you work for an organization that currently...

- ○ holds Magnet™ recognition status from the American Nurses Credentialing Center (ANCC)?
- ○ holds Pathway to Excellence™ recognition status from the American Nurses Credentialing Center (ANCC)
- ○ measures nursing quality (e.g., patient satisfaction surveys, nursing-sensitive database, claims reviews, chart/incident audits, mandatory reporting)?
- ○ participates in NDNQI – the National Database of Nursing Quality Indicators?

When you were first employed after receiving your nursing degree, did you participate in a new nurse residency program at your workplace?

- ○ Yes
- ○ No
- ○ N/A
- ○ Don't know/not sure

HRA Healthy Nurse DEV

Years as a registered nurse.

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HRA Healthy Nurse DEV

Nurse Employment (Part 2)

Which of the listed work settings most closely describes your own?
(Select up to 3 that collectively represent where you spend at least 50% of your time)

- ☐ Academia (University or College)
- ☐ Acute care
- ☐ Addictions
- ☐ Administration
- ☐ Ambulatory care/outpatient clinic
- ☐ Anesthesia
- ☐ Business/ corporation
- ☐ Cardiology
- ☐ Case management
- ☐ College health
- ☐ Consulting
- ☐ Correctional facility
- ☐ Critical care
- ☐ Day care
- ☐ Educator
- ☐ Emergency department
- ☐ Ethics
- ☐ Faith community
- ☐ Forensics
- ☐ General practice
- ☐ Genetics/genomics
- ☐ Gerontological nursing
- ☐ Government or Veterans Health Administration
- ☐ Health insurance
- ☐ Health policy
- ☐ HIV/AIDS care
- ☐ Holistic
- ☐ Home health
- ☐ Hospice
- ☐ Hospital
- ☐ Informatics
- ☐ Infusion
- ☐ International care
- ☐ Leadership
- ☐ Legal consultant
- ☐ Long term care
- ☐ Managed care
- ☐ Management
- ☐ Medical/surgical
- ☐ Military
- ☐ Neonatal
- ☐ Neurology
- ☐ Student
- ☐ Obstetrics
- ☐ Occupational health
- ☐ Office nurse
- ☐ Oncology
- ☐ Orthopedics
- ☐ Pain management
- ☐ Pediatrics
- ☐ Perinatal
- ☐ Perioperative
- ☐ Plastic surgery
- ☐ Post anesthesia
- ☐ Primary care
- ☐ Private practice
- ☐ Professional development
- ☐ Psychiatric/mental health
- ☐ Public health
- ☐ Quality/utilization review
- ☐ Radiology
- ☐ Recruiting
- ☐ Rehabilitation
- ☐ Research
- ☐ Respite care
- ☐ School health
- ☐ Transplant care
- ☐ Women's health
- ☐ Worksite wellness or other health promotion
- ☐ Wound Care
- ☐ Other

HRA Healthy Nurse DEV

Section 2: Healthy Work Environment

This section asks specific occupational health and safety questions about your current place of employment.

In my current work environment...

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Don't know/Not sure	N/A
My employer values my health and safety.	○	○	○	○	○	○	○
I am familiar with written safety guidelines and policies.	○	○	○	○	○	○	○
Safety devices and protective equipment are available to me.	○	○	○	○	○	○	○
Reporting of injuries and health concerns is encouraged.	○	○	○	○	○	○	○
Unsafe conditions and other hazards are quickly identified and corrected.	○	○	○	○	○	○	○
Employees/staff members look out for each other's safety and health.	○	○	○	○	○	○	○
I have an opportunity to be involved in safety planning.	○	○	○	○	○	○	○
I put my patients' health, safety, and wellness before that of my own.	○	○	○	○	○	○	○
I am treated with dignity and respect.	○	○	○	○	○	○	○
I am recognized and thanked for the efforts I make at work.	○	○	○	○	○	○	○

HRA Healthy Nurse DEV

Risks

In my current work environment, I believe I am at a significant level of risk for the following health and safety hazards:
(Select all that apply)

- ☐ Chemical agents in general (e.g. acids, caustics, solvents)
- ☐ High level disinfectants (e.g. glutaraldehyde)
- ☐ Sterilants (e.g. ethylene oxide, hydrogen peroxide)
- ☐ Hazardous drugs (including antineoplastic agents)
- ☐ Latex allergens (e.g. from gloves)
- ☐ Anesthetic gases
- ☐ Smoke from lasers and electrosurgery devices
- ☐ Poor indoor air quality (e.g. molds, cigarette smoke, vehicle exhaust, etc.)
- ☐ Ionizing radiation (e.g. X-rays, gamma rays, etc.)
- ☐ Non-ionizing radiation (e.g. UV, microwaves, radio-frequency, magnetic/electric fields, etc.)
- ☐ Infectious disease agents (e.g. tuberculosis)
- ☐ Blood-borne pathogens (e.g. HIV or hepatitis)
- ☐ Needlesticks and other sharps injuries
- ☐ Noise level
- ☐ Workplace stress
- ☐ Slips, trips, and falls
- ☐ Prolonged standing
- ☐ Lifting/repositioning heavy objects (including patients)
- ☐ Debilitating musculoskeletal injury
- ☐ Violence at work (e.g. assaults, threats, etc.)
- ☐ I have had a work-related injury resulting in medical treatment, lost time from work, or restricted work activities

HRA Healthy Nurse DEV

SPHM

In my current work environment, safe patient handling and mobility (moving, repositioning and mobilizing patients) is applicable to my current job.

HRA Healthy Nurse DEV

SPHM

In my current work environment...

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Don't know/Not sure	N/A
My facility has a safe patient handling and mobility program.	○	○	○	○	○	○	○
I am involved in the selection and evaluation of safe patient handling and mobility technology.	○	○	○	○	○	○	○
I have access to assistive technology to aid in the transfer and movement of patients.	○	○	○	○	○	○	○
I have received adequate education and training on my facility's safe patient handling and mobility technology.	○	○	○	○	○	○	○
I use the safe patient handling and mobility technology every time I transfer or move a patient.	○	○	○	○	○	○	○
I experience musculoskeletal pain at work.	○	○	○	○	○	○	○
In the event of a musculoskeletal injury, I would be comfortable reporting my injury.	○	○	○	○	○	○	○

HRA Healthy Nurse DEV

Bullying/Violence

In my current work environment...

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Don't know/Not sure	N/A
I have experienced verbal or non-verbal aggression from a person in a higher level of authority.	○	○	○	○	○	○	○
I have experienced verbal or non-verbal aggression from a peer.	○	○	○	○	○	○	○
I am worried for my physical safety.	○	○	○	○	○	○	○
I have been physically assaulted by a patient or family member of a patient while at work.	○	○	○	○	○	○	○
I have been verbally and/or physically threatened by a patient or family member of a patient.	○	○	○	○	○	○	○
I have received adequate education and training on bullying and violence prevention protocols and policies.	○	○	○	○	○	○	○
I am comfortable reporting instances of bullying.	○	○	○	○	○	○	○
I am comfortable reporting instances of workplace violence.	○	○	○	○	○	○	○

HRA Healthy Nurse DEV

Worksite Wellness

In my current work environment...

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Don't know/Not sure	N/A
Healthy food choices (e.g. fruits, vegetables, whole grains) are available to me during my work hours.	○	○	○	○	○	○	○
The price for healthy food choices is comparable to the price of other food choices.	○	○	○	○	○	○	○
My work environment is tobacco free.	○	○	○	○	○	○	○
I have access to worksite wellness health promotion programs.	○	○	○	○	○	○	○
I participate in employer sponsored health promotion activities.	○	○	○	○	○	○	○
I have access to employer based exercise facilities and programs.	○	○	○	○	○	○	○
My worksite offers nutrition and weight management classes and counseling.	○	○	○	○	○	○	○

HRA Healthy Nurse DEV

Fatigue/Shiftwork

At my main nursing job, I usually work this schedule:

Combining all my paid employment (and student nursing clinicals), I typically work this many hours a week:

At my primary nursing employment, the usual length of my scheduled work hours are:

In one month, I work mandatory or unplanned overtime this many times:

In my current work environment...

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Don't know/Not sure	N/A
I often have to arrive early or stay late to get my work done.	○	○	○	○	○	○	○
I often have to work through my breaks to complete my assigned workload.	○	○	○	○	○	○	○
I am often assigned a higher workload than I am comfortable with.	○	○	○	○	○	○	○

HRA Healthy Nurse DEV

Absent/Present

I feel obligated or that I am expected to come to work even when I feel sick or am injured.

Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Don't Know/Not Sure	N/A
○	○	○	○	○	○	○

During a typical workday, I feel "present" and engaged this percentage of the time:

In the last year, I have missed this many days of work due to illness or other health condition:

In the last year, I have missed this many days of work due to work-related injury:

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Absent/Present

I reported the injury.

HRA Healthy Nurse DEV

Absent/Present

I didn't report the injury because...
(Select all that apply)

- ☐ There was no one to cover work for me.
- ☐ There was no process for reporting injuries or getting care.
- ☐ I was afraid of retribution.
- ☐ I reported it to my supervisor but was not encouraged to fill out the report and seek treatment.
- ☐ I didn't think the injury was significant.
- ☐ I was too busy.
- ☐ Other

HRA Healthy Nurse DEV

Section 3: Health/Safety/Wellness

This section asks specific physical and mental health questions. It also addresses wellness topics such as diet, exercise and safety topics such as sun exposure prevention and safe driving.

Do you feel well today?

Would you say that, in general, your health is:

During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work or recreation?

During the past 30 days, for about how many days did pain make it hard for you to do your usual activities, such as self-care, work or recreation?

Over the last 2 weeks, how many days have you...

	Days
Had little interest or pleasure in doing things?	
Felt down, depressed or hopeless?	
Had trouble falling asleep, staying asleep or sleeping too much?	
Felt tired or had little energy?	
Had a poor appetite or eaten too much?	
Felt bad about yourself or that you were a failure or had let yourself or your family down?	
Had trouble concentrating on things such as reading the newspaper or watching the TV?	
Moved or spoken so slowly that other people have noticed, or the opposite - being so fidgety or restless that you were moving around a lot more than usual?	
Had decreased or no interest in sex?	

How often do you get the emotional support you need?

Never	Rarely	Sometimes	Usually	Always	Don't Know/Not Sure
○	○	○	○	○	○

HRA Healthy Nurse DEV

History

Have you ever been told by a health care provider that you had...
(Select all that apply)

- ☐ Myocardial infarction
- ☐ Angina or coronary heart disease
- ☐ A stroke
- ☐ Diabetes mellitus
- ☐ Hypertension
- ☐ Chronic obstructive pulmonary disease
- ☐ Gastritis
- ☐ Migraines
- ☐ Lower back pain
- ☐ Allergies
- ☐ Asthma
- ☐ Skin cancer
- ☐ Other types of cancers
- ☐ Depression disorder
- ☐ Anxiety disorder

Has a health care professional ever advised you to change or modify at least one health behavior habit such as tobacco cessation or changes to you eating and/or exercise habits?

- ○ Yes
- ○ No

HRA Healthy Nurse DEV

History

Are you or do you plan on making any advised behavior changes?

- ○ I don't intend to make any of the advised behavior changes.
- ○ I plan on changing at least one of the advised behaviors in the next 6 months.
- ○ I plan on changing at least one of the advised behaviors in the next month.
- ○ I am in the process of making the advised behavior changes.
- ○ I have made at least one of the advised behavior changes and sustained it for 6 months or longer.
- ○ N/A

HRA Healthy Nurse DEV

History

About how much do you weigh without shoes?

About how tall are you without shoes?

Does your health care provider update your electronic health record at least annually?

Do you keep a record of your personal health information (e.g. allergies, family history, immunizations, records of surgeries/hospitalizations)?

HRA Healthy Nurse DEV

Screening

About how long has it been since you last visited a health care provider for a routine checkup?

Within the past year	1 year	2 years	3 years	4 years	5 years or more	Don't Know/Not Sure	Never
○	○	○	○	○	○	○	○

About how long has it been since you last had dental care?

Within the past year	1 year	2 years	3 years	4 years	5 years or more	Don't Know/Not Sure	Never
○	○	○	○	○	○	○	○

If you are a woman over 40 years of age, how long has it been since your last mammogram?

Within the past year	1 year	2 years	3 years	4 years	5 years or more	Don't Know/Not Sure	Never	N/A
○	○	○	○	○	○	○	○	○

If you are a woman, how long has it been since your last breast cancer screening exam?

Within the past year	1 year	2 years	3 years	4 years	5 years or more	Don't Know/Not Sure	Never	N/A
○	○	○	○	○	○	○	○	○

If you are a woman under 65 years of age, how long has it been since your last cervical cancer screening (such as Pap test)?

Within the past year	1 year	2 years	3 years	4 years	5 years or more	Don't Know/Not Sure	Never	N/A
○	○	○	○	○	○	○	○	○

If you are a man over 40, how long has it been since you had your last PSA test or digital rectal exam?

Within the past year	1 year	2 years	3 years	4 years	5 years or more	Don't Know/Not Sure	Never	N/A
○	○	○	○	○	○	○	○	○

HRA Healthy Nurse DEV

Immunization

During the past 12 months, have you had the seasonal flu vaccine, either as a shot in the arm or a nasal spray, mist or drop?

Have you had at least 3 doses of the Hepatitis B vaccine?

If you are an older adult OR have certain risk factors (including chronic health problems; drug, treatment, condition, or disease that lowers your body's resistance to infection; long term care resident; or smoke) have you received the pneumococcal vaccine?

If you are 60 years of age or older, have you received the zoster (shingles) vaccine?

HRA Healthy Nurse DEV

Nutrition

During the past month, about how many servings PER DAY did you eat of a variety of fruits and/or vegetables?

During the past month, about how many servings PER DAY did you eat of whole grains?

How many meals a week do you eat food from a restaurant, fast food chain, cafeteria or other similar establishment?

How many ounces of sugar-sweetened beverages, such as regular soda or juice, do you drink weekly (i.e. a can of soda is typically 12 ounces)?

HRA Healthy Nurse DEV

Physical Activity

In a typical week, do you perform muscle-strengthening activities (e.g. activities using your own body weight, like yoga, sit ups or pushups and those using weight machines, free weights or elastic bands – not counting aerobic activities like walking, running, or cycling) on 2 or more days?

In a typical week, do you engage in aerobic physical activity of at least moderate intensity for 2.5 hours (e.g. walking 3 mph or faster, but not race-walking, water aerobics, bicycling slower than 10 mph), or 1.25 hours of vigorous intensity (e.g. race walking, jogging/running, swimming laps, tennis (singles), aerobic dancing, bicycling 10 mph or faster, jumping rope, or an equivalent combination?

HRA Healthy Nurse DEV

Healthy Sleep

On average, I get this many hours of sleep in a 24-hour period, including naps:

During the past 30 days, I have nodded off or fallen asleep, even just for a brief moment, while driving.

HRA Healthy Nurse DEV

Tobacco

Do you currently smoke cigarettes?

If you do smoke cigarettes, are you trying to quit?

Do you currently use smokeless tobacco products such as chewing tobacco, snuff, or snus?

If you do use smokeless tobacco products, are you trying to quit?

HRA Healthy Nurse DEV

Alcohol Consumption

During the past week, how many units of any alcoholic beverage did you drink? (a unit is 12 ounces of beer, 5 ounces of wine, 8 ounces of malt beverage or 1.5 ounces of liquor)

Considering all types of alcoholic beverages, how many times during the past 30 days did you drink 4 or more drinks within 2 hours (for women) and 5 or more drinks within 2 hours (for men)?

HRA Healthy Nurse DEV

Skin Cancer

When you go outside for more than one hour, how often do you...

	Never	Rarely	Sometimes	Most of the time	Always	Don't know/Not sure	N/A
Stay in the shade?	○	○	○	○	○	○	○
Wear a baseball cap or sun visor?	○	○	○	○	○	○	○
Wear a hat that shades your face, ears and neck such as a hat with a wide brim all around?	○	○	○	○	○	○	○
Wear a long sleeved shirt?	○	○	○	○	○	○	○
Wear long pants or other clothing that reaches your ankles?	○	○	○	○	○	○	○
Use sunscreen?	○	○	○	○	○	○	○

What is the SPF number of the sunscreen you use most often?

During the past 12 months, how many times have you used any artificial sources of ultraviolet light for tanning (such as a sunlamp, sunbed or tanning booth)?

HRA Healthy Nurse DEV

Distracted Driving

Do you ever drive a car?

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HRA Healthy Nurse DEV

Distracted Driving

How often do you drive...

	Never	Rarely	Sometimes	Most of the time	Always	Don't know/Not sure
While talking on the phone?	○	○	○	○	○	○
While texting?	○	○	○	○	○	○
While eating?	○	○	○	○	○	○
While engaging in any other activity that diverts your attention from driving?	○	○	○	○	○	○

HRA Healthy Nurse DEV

Submission

*There are no further questions in this survey. If you are satisfied with your answers and wish to submit this survey, please select Yes from the dropdown menu below and click the Submit button. If you wish to change or review your answers, navigate back or choose No from the dropdown menu to navigate to the beginning of the survey.

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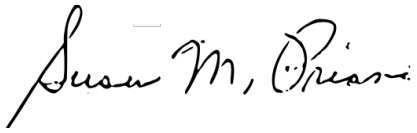

June 16, 2017

Author Signature Date