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## Ensuring The Continuation Of The Public Health Nurses Workforce: Comparison Of Work Outcomes With Nurses In Other Sectors Of Healthcare

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# Ensuring The Continuation Of The Public Health Nurses Workforce: Comparison Of Work Outcomes With Nurses In Other Sectors Of Healthcare

## Abstract

ABSTRACT

ENSURING THE CONTINUATION OF THE PUBLIC HEALTH NURSES WORKFORCE: COMPARISON OF WORK OUTCOMES WITH NURSES IN OTHER SECTORS OF HEALTHCARE

Melissa L. Charlie

Linda H. Aiken

The Quality Health Outcomes Model (QHOM) is the conceptual model guiding this study (Mitchell, Ferketich, & Jennings, 1998). The specific aims of this study are twofold: (1) compare nurse job outcomes, job dissatisfaction, burnout, and intent to leave, of public health nurses (PHN) with nurses that share historical roots with PHS, specifically school nurses (SN) and home health nurses (HHN); (2) determine the extent to which modifiable features of the work environment, including employment benefits, are associated with favorable nurse outcomes. This dissertation is a secondary analysis of data obtained from the RN4CAST-US, a National Institute of Nursing Research- (NINR-) funded survey of nurses undertaken by the Center for Health Outcomes and Policy Research at the University of Pennsylvania School of Nursing in 2015-16. Methods of analysis for this study included descriptive data analysis, tests of difference between groups, measurement of outcomes with logistic regression models, and calculation of predictive probability. The level of analysis was the individual nurse. The sample consisted of 529 PHN, 1208 SN, and 3079 HHN. PHN had the highest percentage (94%) of participation in a retirement plan compared to SN (86%) and HHN (64%); PHN also participated in pension plans at the highest percentage (66%). Regardless of variables added to the logistic regression models, the work environment, measured by the Practice Environment Scale, was significantly associated with reduced odds of high burnout (82%), job dissatisfaction (86%), and intent to leave (72%). The probability of PHN experiencing high burnout was 20%, job dissatisfaction 16%, and intent to leave 16%. SN had the lowest probability of burnout, job dissatisfaction, and intent to leave (15%, 8%, and 7%, respectively). HHN had the highest probability of burnout, job dissatisfaction, and intent to leave (29%, 19%, and 17%, respectively). PHN were dissatisfied with salary, opportunity for advancement, and independence at work. HHN were dissatisfied with their work schedule, retirement, health, and tuition benefits. SN were dissatisfied with their professional status. Additional research is needed focusing on the work environments of PHN, SN, and HHN, and potential development of recruitment and retention strategies to assure continuation of public health nursing.

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ENSURING THE CONTINUATION OF THE PUBLIC HEALTH NURSES WORKFORCE:  
COMPARISON OF WORK OUTCOMES WITH NURSES IN OTHER SECTORS OF  
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Melissa L. Charlie

A DISSERTATION

in

Nursing

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in

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2017

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## *Dedication*

To Terry Schumaker, DNP, RN, APRN-BC, my partner of the last 13 years, and hopeful visionary for the profession of nursing. While you completed your degree at CU, you told me never to give up hope of completing my PhD; you reminded me often that I do not know the future and that one day I might have an opportunity. Thank you for your encouragement and support starting from before the opportunity to complete the degree and throughout the 18 months of work on my dissertation. You have kept our lives running with little time contribution from me. And, thank you for reminding me daily about the importance of nursing---your commitment to the ethics of the profession, your donation of time to serve on boards, your willingness to write articles with a team, and your unwavering passion to provide the best care to patients regardless of ability to pay---you have always embodied what is great about nursing and push me to look at the profession through different lenses. I could not have completed my dissertation without you.

To my mother, Lucinda Charlie, thank you for a lifetime of support. You encouraged me to do well in school. Throughout your life you have worked two jobs to support me and my brother, Francis; you taught us to work hard and to never let anyone's prejudices be a reason for any failure. You were also the first person to suggest that I become a nurse when I thought about being an accountant. Thank you for your support, direction, work ethic and determination.

This is also dedicated to my brother, Francis, and his family. Thank you.

I could not have taken time away from work to complete this dissertation without the support of my boss, Connie Dixon. I am fortunate to have an empathetic, insightful, and wise boss.

And, finally, thank you to the dissertation committee and everyone at CHOPR. The support from the Center allowed me to bridge the distance. I hope that this dissertation will contribute to the body of work from CHOPR.

## ABSTRACT

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## **Chapter 1: Introduction and Specific Aims**

Public health nurses (PHN) in the United States have a unique history, identity, organization, and purpose. As of 2010, there were approximately 38,971 PHN working in local or state health departments (University of Michigan Center of Excellence in Public Health Workforce Studies, University of Kentucky Center of Excellence in Public Health Workforce Research and Policy, 2012). While most nurses work to provide personal health care services, public health nurses focus on providing population health care. They provide direct care to patients, work as health consultants in communities, often linked to and or administering federal grant programs, including disease surveillance and emergency preparedness activities. The operational budgets of local and state health departments to employ PHN are derived from public funds and grants (Schaffer, Keller, & Reckinger, 2015), in contrast to the personal health services sector which is largely financed by health insurance.

Little is known about the work environments of public health nurses and their job satisfaction, which is highly pertinent for ensuring the sustainability of the public health nursing workforce and its important contributions to population health (Swider, Levin, & Kulbok, 2014). On the one hand, the dependence upon public financing and grants creates the potential for high workloads in public health nursing; on the other hand, public agencies sometimes provide their employees with stable professional career opportunities, engender employee loyalty, and offer valuable non-salary benefits. Home care is now mostly provided by private agencies in the personal services sector, many of which are for-profit entities, while school health nursing, like public health, remains largely publicly funded but resides for the most part in education rather than in healthcare.

### **Study Overview**

This study seeks to fill the gap in knowledge about public health nurses' job satisfaction and intention to remain in public health nursing as compared to the public health nursing-derived specialties of home care and school health. Using the Quality Health Outcomes Model (QHOM) (Mitchell, Ferketich, & Jennings, 1998), we seek to determine whether negative job outcomes

among public health nurses, to the extent we find them, are associated with modifiable features of their work environments. The results should inform policies that can improve the retention of public health nurses in their important work of promoting population health.

The specific aims of the proposed study are:

1. To compare nurse job outcomes including job satisfaction, burnout, and intent to leave, of public health nurses (PHN) with nurses that share historical roots with public health nurses, specifically school nurses (SN) and home health nurses (HHN).
2. To determine the extent to which modifiable features of the work environment, including employment benefits, are associated with favorable job outcomes for public health nurses.

## **Chapter 2: Substantive Review of the Literature**

### **Changes in Public Health Nursing**

The work of public health nurses is changing. Public health nursing originally started as a service providing home visiting programs to serve populations unable to afford private medical and hospital based care (Fulmer, 2017). The emphasis was serving at risk populations such as immigrants and economically distressed groups (Buhler-Wilkerson, 1993). Public health nurses provided school nursing services with the initial goals of providing care for the student, the family of the student, and the community of the school (Crandall, 1915). In recent years, home health nursing services are increasingly provided by private healthcare entities, and home health nursing has evolved into a separate specialty of nursing. Outside of specific home visitation programs such as the Nurse Family Partnership (Olds, Henderson, Tatelbaum, & Chamberlin, 1988) and tuberculosis programs offering directly observed therapy (DOT), home visitation is no longer the focus of public health nursing. It is estimated home visit services by PHN constitute only about 3% of the work of full-time equivalent (FTE) employees in a typical health department (Boulton & Beck, 2013). School health, at one time provided by public health nurses, is also a separate nursing specialty and is often under the authority of departments of public education rather than public health. Only 4% of school nurses reported a public health department as their primary employer (Mangena & Maughan, 2015).

Home health nursing and school nursing started from the common root of public health nursing. Public health nursing started as district nursing or visiting nursing associations to provide skilled nursing care for the poor in their home in 1875. The low-income worker often could not afford the cost of hospital based skilled nursing care or private medical care. In addition to skilled nursing care, public health nurses also taught hygiene and self-care. The recommended educational preparation for PHN was a graduate of a nursing training-school with sufficient skills to handle common health problems and emergencies. By 1900, several visiting nurse associations were staffed by nursing students at the training schools. During this time, public

health nursing was funded through philanthropy. In 1900, only one municipality, the city of Los Angeles, directly funded a public health or visiting nurse (Fulmer, 2017).

Lillian Wald advocated the use of the term “public health nursing” as opposed to district nursing or visiting nurse. Miss Wald asserted that the term reflected the social and economic knowledge requisite for a competent public health nurse (Buhler-Wilkerson, 1993). In 1897 in New York City, the process of hygiene control required a health department physician to examine students for contagion. This process resulted in the exclusion of poor immigrant students from school until the contagion resolved. In 1902, Lillian Wald offered the Board of Education and Health Commissioner of New York City, the use of one nurse from the Henry Street Settlement for several schools in the area for a one-month experiment. The role of the public health nurse was to treat minor contagion, such as scabies or impetigo, in school age children, visit the families of the children to reduce the spread of infection or contagion, and to visit the residence of any child who was absent from school. By 1903, the Board of Education appropriated \$30,000 to hire nurses to work in the school system. This began the role of the public health nurse in the school system (Hawkins, Hayes, & Corliss, 1994) and began the shift of funding for public health nursing from philanthropy to publicly funding.

Public health nursing has changed throughout the decades. Predominantly thought of in relation to home visitation programs, from 1920 to 1952, the Metropolitan Life Insurance Company paid for home visitation for every policy holder nationwide. The fee from the insurance company fueled the practice and expansion of public health nursing and home visitation services (Buhler-Wilkerson, 1993). Due to improvement in public health and safety, including access to clean water, access to uncontaminated foods, hospital-based maternal child education, and antibiotics, the demand for home nursing visitation declined beginning in the mid-1950s until the advent of Medicare in 1966 (Shapiro & Einhorn, 1964).

The changes in public health and roles of the public health nurses brought about changes in educational preparation of public health nurses. Recommended education for public health nurses shifted from basic nurse training with on the job training to basic nurse training with

certificate courses. Finally, in 1952, the recommendation for entry into practice for public health nurses was preparation at the baccalaureate level (Roberts & Heinrich, 1985; Kulbok & Glick, 2014). This continues as a current recommendation (Swider, Krothe, Reyes, & Cravetz, 2013). According to a public health nurse workforce survey, approximately 39% of public health nurses have an associate degree in nursing, and 61% have a bachelor's degree or higher (Boulton & Beck, 2013).

### **Home Care Evolving**

In 1966, at the start of Medicare, there were 1543 certified home health agencies which accounted for 3% of the total reimbursement from Medicare during the first year of implementation. There were 228,000 notices to start home health services, or 12 notices for every 1,000 enrollees (Rice, 1968). By 1969, 2184 Medicare certified home health agencies were in operation. At that time, official health departments accounted for 64% of home health agencies, visiting nurse associations accounted for 25%, proprietary agencies 1%, and the remaining 9% were affiliated with hospitals, extended care facilities or rehabilitation facilities (Ryder, Stitt, & Elkins, 1969). In the mid-1960s, public health nurse salaries were 118% of hospital nurse salaries (Nickel, Thomas, Eastman, Holton, & Skuly, 1990). Following 1968, Medicare reimbursement was highly influential in the evolution of home care and public health nursing. Home visiting programs by PHN resulted in reimbursement and subsequent revenue for official public health agencies. This reimbursement funded other public health activities that were essential but without reimbursement, revenue, or funding, such as surveillance and epidemiology.

The implementation of the hospital Prospective Payment System (PPS) and Diagnostic Related Groups (DRG) in 1982 changed the landscape of home health. Medicare patients were discharged to home health "sicker and quicker" (Wood & Estes, 1990; Easton, Cogen, & Fulcomer, 1991). Hospitals were incentivized to reduce length of stay through various strategies, including hiring more nurses. The PPS constrained cost and maintained quality of care (Davis & Rhodes, 1988). The demand for nurses by hospitals precipitated rising pay for hospital nurses. During this time, public health nurse salaries fell to 91% of hospital nurses by 1984 (U. S.



Department of Health and Human Services, 1986). Salaries for public health nurses remain less than those of hospital nurses. Eventually, Medicare payment policies for individual beneficiary home care services resulted in more community (not public health) based home health agencies entering the home visitation market.

Home visiting programs in public health agencies were faced with mandates to purchase more medical equipment, hire nurses with more critical care experience, and staff nurses over 24 hours (Coleman & Smith, 1984). Most public health agencies could not meet these demands, while other community home health agencies with capacity for specialty care or affiliated with hospitals could. When public health departments could not raise salaries to compete with other home health agencies or hospitals, some health departments ceased to provide home health services or other public health nursing services (Nickel, Thomas, Eastman, Holton, & Skuly, 1990). For those public health agencies continuing to maintain a home health programs, the patient case mix and acuity continued to shift. In one state, home health patients seen by public health nurses were often those in need of chronic care, care that was ineligible for reimbursement through Medicare. Eventually public health agencies began to decrease home visitation programs or to target the certain populations or interventions supported or reimbursed by federal grants (Phillips, Cloonan, Irving, & Fisher, 1990). More program specific federal funding for public health became available for clinic-based activities, such as Women, Infants, and Children (WIC), and maternal child health (Kornblatt Phillips, MacMillian-Scattergood, Fisher, & Baglioni, 1988).

The Balanced Budget Act (BBA) of 1997 brought further changes to public health and public health nursing services. This emerged through the Medicare Interim Payment System (IPS) and subsequent Prospective Payment System (PPS) in 2000 for Medicare certified home health agencies. In 1996 there were 1400 Medicare certified home health agencies owned by public agencies and in 2002 there were 1014 of such agencies (Choi & Davitt, 2009). The changes in Medicare and the changes in the focus of public health continued to erode public health nursing home health programs.

## **School Nursing**

School nursing is rooted in public health and focuses on the well-being, academic success, and health of students (Maughan, Bobo, Butler, Schantz, & Schoessler, 2015). In the 1960s, comparisons between public health nurses working in schools and school nurses found that school nurses often provided more health activities and faced fewer barriers to working with students in schools (Basco, 1963; Staton, 1963). In addition, health departments struggled to meet the demand for school nursing services, which often consumed the most work hours of the PHN. Various strategies were explored to improve efficiency of PHN, including expanding the use of school health aides (Rosner, et al., 1967; Tower & Fay, 1968). The advent of vaccines and changes to environmental health caused school nursing to shift from screening for contagion to screening for hearing, vision, and immunizations. With the move, away from public health nursing, the cost, and the need for specialization, by the early 1960s, 87% of school nurses were employed by boards of education and not health departments (Hawkins, Hayes, & Corliss, 1994). By 2014, only 4% of school nurses reported that a health department was their primary employer (Mangena & Maughan, 2015).

## **Future of Public Health Nursing**

There are fewer public health nurses now than in 1967 during the implementation of Medicare. In 1966, there were about 50,000 PHN (Roberts, Saba, & Allen, Census of nurses, 1970) or one PHN for every 3,938 people based on the 1966 census (U. S. Bureau of the Census, 1967). PHN are no longer the largest segment of the public health workforce; rather are second largest behind administrative personnel. The total estimated number of PHN is about 46,558 (Beck, Boulton, & Coronado, 2014) or about 1 PHN for 6,631 people based on the 2010 census (United States Census, 2017). The scope of work for public health nurses has also changed. Home health and school nursing have branched off from public health nursing and evolved into their own specialties. Home health nursing has been defined as community health nursing, with skills comparable with nursing specialties such as medical-surgical nursing and

gerontological nursing (Marelli, 1996). These changes in actual and relative numbers of PHN as well as the narrowing of their roles raise questions about the present and future attractiveness of public health nursing as a career.

Along with changes in funding for public health, policy changes that have benefited the public in general, such as The Affordable Care Act (ACA). More people have health insurance, and public health and the role of public health nurses could shift from providing clinical preventive services, such as immunizations or reproductive health services, to other public health services. Since the implementation of the ACA, some public health clinical preventive services were proposed to be integrated into the role of primary care providers (Institute of Medicine, 2012). The Prevention and Public Health Fund provides block grants to states or other entities for public health functions such as laboratory services, epidemiologic capacity, emergency preparedness, chronic disease prevention, and other public health functions (United States Government Accountability Office, 2012). The future of the role of public health nurses in the changing public health system is unclear and unpredictable.

Given the change in scope of practice and the overarching origins, this study will focus on whether and in what ways job satisfaction and nursing outcomes of public health nurses, home health nurses, and school nurses differ, and the extent to which the differences are associated with work environments. The overarching goal of the study is to identify potentially promising strategies to improve nurse outcomes, particularly, among public health nurses whose future seems most in doubt.

### **Comparisons of Job Satisfaction**

There have been a few studies about job satisfaction and public health nursing, home health nursing, and school nursing. A systematic search was completed for the review of literature. The terms “job satisfaction,” “public health nursing,” “public health nurse,” “school nurse,” and “home health nurse” were used as search terms in PubMed Central, CINAHL, and Ovid/Medline. All research journal articles studying populations in the United States were

included. Twenty-five journal articles met the criteria. One article was found that reviewed the literature from 2000 to 2010 for public health nursing and work environment (Dingley & Yoder, 2013). Nine of the 25 articles are less than 10 years old; and 16 of 25 included nurses from one state or organization. Only two studies measured work environment using the Practice Environment Scale. The studies from one state and the studies more than 10 years old provide insight into job satisfaction, but findings may not be relevant to the current public health system and derivative specialties. A detailed chronological summary of the studies follows by nurse type.

One of the first studies of job satisfaction and public health nursing was published in 1988. The authors (Lucas, McCreight, Watkins, & Long, 1988) sought to measure job satisfaction in public health nurses (n=717) in South Carolina. Organization characteristics were measured through place of health district, program responsibility, and job position. Using the Stember's instrument, public health nurses were moderately satisfied with work and in general, administrators and supervisors were more satisfied than nurses and nurse practitioners. All nurses in the organization were most satisfied with job importance, interpersonal relationships, and achievement; they were least satisfied with job tasks, specifically documentation requirements, recognition, and salary/benefits. The limitations of this study are the lack of a work environment measure, the limitation of one study state, and the lack of relevance to the current public health system.

Job satisfaction in community health nurses in North Dakota, (n=258) was studied (Dunkin, Juhl, Stratton, Geller, & Ludtke, 1992). The study focused on characteristics of the nurses in the community (public health nurses and home health nurse), and whether those characteristics had an impact on job satisfaction and intention to stay. A second aim was to measure whether there was a relationship between job satisfaction and job tenure. Stamps and Piedmonte Job Satisfaction Index was used in this study. Due to the rural and frontier nature of the state, job availability was the greatest factor in the decision to remain in their current position. The nurses were least satisfied with salary. This study focused on one state and did not include a measure of work environment.

A study of job satisfaction of PHN and HHN examined the level of job satisfaction, what each groups' job satisfaction was, and if there was a difference of job satisfaction between staff nurses and administrators (Juhl, Dunkin, Stratton, Geller, & Ludtke, 1993). The Stamps and Piedmonte Job Satisfaction Scale was used. Public health nurses were the least satisfied with salary and home health nurses were significantly less satisfied with benefits/reward, task requirements and professional status. There was no difference of job satisfaction between staff nurse and administrators. The limitations of this study are that one state was represented and work environment was not measured.

Another one state job satisfaction study asked PHN attending a training to respond to two surveys: Job Description Index (JDI) and the Job in General (JIG) (Beall, Baumhover, Gillum, & Wells, 1994). There were 185 respondents. The researchers found that most nurses were dissatisfied with their pay and opportunity for promotion. Off sight supervision, the rules of working in a civil agency, civil service pay, and rules related to promotion were issues identified by public health nurses. The limitation of this study is the use of a convenience sample and the lack of organizational measures.

Job satisfaction among five public health occupational groups was compared with the intention of developing targeted interventions for each occupational group (Oleckno & Blacconiere, 1995). The sample consisted of staff (n=602) from nine health county health departments in northern Illinois. The Job Description Index (JDI), Job in General scale (JIG) and Occupational Needs Questionnaire (ON-Q) were used to measure job satisfaction for environmental health (EH), nursing (PHN), health administration (HA), other public health, and public health support services. Health administrators were significantly satisfied with their job except for opportunity for promotion. Public health support staff were least satisfied with their job except for pay. This is another one state study in which work environment was not measured.

One team (Laffrey, Dickenson, & Diem, 1997) investigated role identity of community health nurses and whether role identity affected job satisfaction. General public health nurses (PHN), home health care nurses (HHN), nurses who worked as both public health and home

health care (PH/HHN), and specialized public health nurses were given a role identity instrument by Coler and Sutherland. Job satisfaction was measured through the Nurse Job Satisfaction Scale (NJSS). The results were that the nurses had a common identity as educator, advocate, and resource person. There was no significant difference between groups in job satisfaction. The major limitation of this study is that only 43 nurses were in the sample. A few of the nurses in the sample noted that there was a shift from general funding for public health to specialized funding for specific programs.

Cumbey and Alexander (1998) measured organizational variables of structure, technology, and environment on job satisfaction among public health nurses in a southeastern state in the US. The survey sample included all nurses working in 13 health districts and one central office which included 800 registered nurses, 31 licensed practical nurses, and 7 unspecified nurses. Each nurse in the study was given 4 instruments: structure instrument, technology instrument, environment instrument, and the McCloskey-Muller Job Satisfaction Scale (MMSS). The structure variables, vertical participation, horizontal participation, and formalization were associated with increased job satisfaction. There was no relationship between job satisfaction and technology or environment. Vertical participation, horizontal participation, and formalization of job process were associated with greater job satisfaction. This study is a one state study.

Characteristics of organizational structure and job satisfaction in public health nursing in southern Illinois were measured using the Alexander Structure Instrument, respectively. McCloskey/Muller Satisfaction Survey (MMSS) (Campbell, Fowles, & Weber, 2004 ). Twenty county based health departments participated. The sample size included 181 registered nurses and 10 licensed practical nurses. Overall, public health nurses experienced moderate job satisfaction. Organizational structures that were linked to great job satisfaction were horizontal and vertical integration, autonomy, and a flexible schedule. As part of the study, the PHN were asked what could improve their job satisfaction. Their responses were better pay, more input, and role clarity. The limitations of the study is a limited sample size and sample from one state.

Another study examined the characteristics of public health nursing and the competency of public health nurses in Idaho, specifically comparing one nurse offices to multi-nurse offices (Bigbee, Gehrke, & Otterness, 2009). A survey of public health nurses was completed in May 2007. The sample size included 124 nurses; fifteen of the 124 worked in a one nurse public health office. The authors found that nurses working in one nurse offices were comparable in competency of nurses working in multi nurse office settings. PHN who worked solo had to implement a variety of services, experienced strong job satisfaction and liked the autonomy. However, the solo nurses felt disconnected from the larger state office. The limitations of this study are that the comparison groups are very unequal, 15 solo nurses to 109 other nurses, and were from one state. In addition, the competency scale had never been validated but was based on the Quad Council recommendations for public health nursing practice.

A more recent study looked at job satisfaction in rural public health nurses (Cole, Ouzts, & Stepan, 2010). The authors surveyed public health nurses in Wyoming in April 2006 to measure job satisfaction and to determine if public health nurse managers and public health staff nurses had different levels of job satisfaction. Jobs satisfaction was measured using Stember's Web-based 80 question survey. The sample size was 88 with 90% of nurse managers completing the survey compared to 50% of staff nurses. There was no difference in job satisfaction between nurse managers and staff nurses. Both groups were most satisfied with opportunities for professional fulfillment and least satisfied with compensation and job stability. In general, the public health nurses were satisfied because they had a flexible schedule, autonomy, and a benefit package. Since this survey targeted rural nurses, it is unknown if nurses in the most rural areas of Wyoming had access to this web-based survey. The small sample size and sample from one state continue to be a limitation of PHN job satisfaction studies.

Royer (2011) studied work characteristics for community and public health nurses across 10 states seeking accreditation. The study did not examine job satisfaction but is included in this review because the outcome of interest was intention to stay in the job. The study measured intention to remain in a job as a function of empowerment of the nurse and commitment of the

nurse. Across 10 states, 78 public health entities and 464 public health nurses were sampled using Spreitzer's Structural and Psychological Empowerment instrument and Meyers and Allen's "TCM Work Commitment Survey." The main result was that regardless of work characteristics, empowerment and loyalty, public health nurses thought about leaving their job. The survey did not include questions about why the nurses would consider leaving their job. The researcher (Royer, 2011) asked nurses to complete an ad hoc questionnaire, to which 164 nurses responded. From the ad hoc study, reasons the nurses cited for planning to leave their current public health job were low pay relative to other nursing specialties and the decreased funding for health departments, which led to hiring freezes and increased work load.

A systematic literature review by Dingley and Yoder (2013) summarized the work environment of public health nurses. The review included public health nursing research from 2000 to 2010 and included studies from the United States, Canada, Japan, New Zealand, and Taiwan. The common findings were that management support and professional growth were important to public health nurses. Public health nurses valued job autonomy and teamwork and wanted greater input into professional practice. Of note, the researchers concluded that most nurses were satisfied with pay based on two studies, (Campbell, Fowles, & Weber, 2004 ; Cole, Ouzts, & Stepans, 2010). However, in the study by Campbell, Fowles, & Weber, 2004, PHN requested better pay. In the study by Cole, Ouzts, & Stepans, 2010, the sample was from a very rural state where jobs and salary might not be an issue compared to distance traveled to work. Moreover, several studies of job satisfaction and public health nurses found nurses were not satisfied with their pay (Juhl, Dunkin, Stratton, Geller, & Ludtke, 1993; Beall, Baumhover, Gillum, & Wells, 1994; Zahner & Gredig, 2005; Cole, Ouzts, & Stepans, 2010; Royer, 2011). This dissatisfaction extended further, as one study found nurses were dissatisfied with their pay and benefits (Lucas, McCreight, Watkins, & Long, 1988), and another study found that public health nurses were also dissatisfied with potential for job advancements or promotion (Beall et al., 1994). An earlier study found public health nurse administrators were more satisfied with their jobs than



public health nurses and advance practice nurses providing direct care in health departments (Lucas et al., 1988).

The largest study to date of PHN in the United States was conducted in 2012 (Boulton & Beck, 2013). The study sample included 310 local health departments, which was drawn by a stratified random sample of the 2,565 local health departments and all 50 state health departments, of which 45 responded. Individual respondents, PHN, received a survey from the sample of the local health departments and from 9 randomly selected state health departments. The individual PHN sample included 2,697 registered nurses of an estimated 7,500 potential respondents. This survey found that most of the nurses reported satisfaction with the job (85%), but had concerns about promotion (56%), salary (46%), and job stability (40%). The high level of reported job satisfaction contrasts with the organizational survey findings in the study reporting difficulty retaining and recruiting public health nurses (Boulton & Beck, 2013). The survey did not query burnout, practice environment or intention to remain in current job. In addition, the respondents for the survey at the organizational level could have been an administrator, nurse manager, chief nurse, health officer, or other personnel.

Studies about job satisfaction of school nurses are limited. Areas of the greatest satisfaction are job flexibility and paid holidays, and the least satisfying areas for school nurses were salary, level of trust and support of administrators, cooperation of parents and cooperation of other school staff (Junious, et al., 2004). Foley and colleagues (Foley, Lee, Wilson, Cureton, & Canham, 2004) measured job satisfaction using the Index of Work Satisfaction in a convenience sample of 299 school nurses in California. The authors found that school nurses were largely dissatisfied with their job, with an overall score of 11.6 (range 0.9 to 37.1). School nurses were most dissatisfied, in decreasing order, with task requirements, pay, and professional status. They were most satisfied, in decreasing order, with autonomy, interaction, and organizational policies. A phenomenological study on school nurses studied how nurses work with challenges and successes. One of the findings was that positive school nurse-student interaction was important for school nurse job satisfaction (Smith & Firmin, 2009).

Riordan (1991) compared job satisfaction among home health nurses (HHN), public health nurses, and school nurses (SN). The sample size of nurses was limited and included 52 school nurses, 24 home health nurses, and 32 community health nurses (defined as public health nurses or nurses working in community clinics). Six scales were regressed as predictors of job satisfaction: task requirements, organizational requirements, social interaction, pay, autonomy, and prestige. The only significant predictor of job satisfaction was prestige. There was no comparison of job satisfaction between the groups of HHN, PHN, and SN. Moreover, this study was conducted 25 years ago and public health nursing has undergone significant change since then as noted above.

Another study (Hughes & Marcantonio, 1991), also dated now, measured job rewards of compensation, job scope, skill usage, experience, and benefits as a predictor for willingness to remain in a job. The sample included 204 hospital nurses, 217 home health nurses, and 277 public health nurses in a single state, Illinois. A comparison among the groups identified that home health and public health nurses were more likely to be diploma nurses. There was no difference in salary between the three groups and hospital nurses had better benefits. For hospital nurses, skill use, job scope and experience were predictors of willingness to stay. Home health nurses were willing to remain in their job because of skill usage and fewer weekend shifts. There was no analysis completed for public health nurses because public health nurses were thought to be like home health nurses.

Ellenbecker (2004) proposed a theoretical model of job retention of home health nurses. In this model, job retention is related to job satisfaction (consisting of extrinsic and intrinsic rewards) directly and indirectly through intention to stay. Based on the theoretical model the Home Healthcare Nurses' Job Satisfaction Scale (HHNJS) was developed, tested, and found to be a reliable and valid predictor of job satisfaction for home health nurses (Ellenbecker & Byleckie, 2005). In addition, content analysis of 2,273 HHN responses to open ended question about what nurses like most about their job and what might cause them to leave yielded themes consistent with factor from the HHNJS (Ellenbecker, Boylan, & Samia, 2006). The HHNJS scale

was used to measure job satisfaction in a convenience sample of 340 HHN in ten home health agencies in five states. Home health nurses were most satisfied with patient relationships and autonomy and professional pride. They were least satisfied with salary and benefits, and stress and workload (Ellenbecker & Byleckie, 2005). A major limitation of the studies were sampling nurses through the home health agency and using a convenience sample. In addition, there was no study of work environment and job satisfaction.

Building on previous studies, Ellenbecker, et. al (Ellenbecker, Portell, Samia, Byleckie, & Milburn, 2008) sampled 1,912 HHN from 149 randomly select home health agencies, of which 123 participated across six New England states. The purpose of the study was to test the model formerly proposed model of HHN retention, intention to stay, and job satisfaction and to examine the impact of individual, agency, and market characteristics on retention, intention to stay, and job satisfaction. Structural equation modeling and factor analysis were used to analyze the data from HHNJS, individual HHN characteristics, agency characteristics and market characteristics. Overall, job tenure was the strongest predictor of retention. Other key findings for retention and intention to stay were job satisfaction, job benefits, wages, agency size, and ownership (Ellenbecker, Portell, Samia, Byleckie, & Milburn, 2008). Work environment was not measured.

Only studies associated with the University of Pennsylvania's Center for Health Outcomes and Policy Research (CHOPR) have considered the impact of work environment on job satisfaction and home health nurses, but not on school nurses or public health nurses. Flynn (2007), employing the Nurse Work Index Revised (NWI-R), found that home care organizational support resulted in less adverse events and higher job satisfaction, but that high job satisfaction was not a significant predictor of intention to leave. The same study found that organizational support was a significant predictor of intention to leave. Jarrin, Flynn, Lake, and Aiken (2014) measured the home health agency work environment using the Practice Environment Scale (PES) and home health nurse outcomes. The study found that better home health agency work environments were associated with lower nurse burnout as well as better patient outcomes

including lower use of the hospital and greater likelihood of patient discharge to home (Jarrin, Flynn, Lake, & Aiken, 2014).

Nurse outcomes for job satisfaction, burnout, and intention to leave have been well studied in the hospital setting (Aiken L. H., Clarke, Sloane, Lake, & Cheney, 2008; Aiken L. H., Clarke, Sloane, Sochalski, & Silber, 2002). Using a multistate research survey (McHugh, Kutney-Lee, Cimiotti, & Aiken, 2011), nurses who worked in hospitals but did not provide direct patient care had better nurse outcomes, including greater job satisfaction, less burnout, and less frequent intention to leave their position, as compared to nurses working in hospitals who provided direct patient care. This finding applied to nurses working in other settings as well. Home health nurses who provided direct patient care experienced less job satisfaction and more burnout than home health nurses who did not work with patients or who had non-nursing roles. Given the changing role of public health nurses and healthcare needs within the context of the health care system, it is important to study public health nurses compared to nurses working in other settings. The potential implications could be to identify strategies for improving recruitment and retention of nurses to public health.

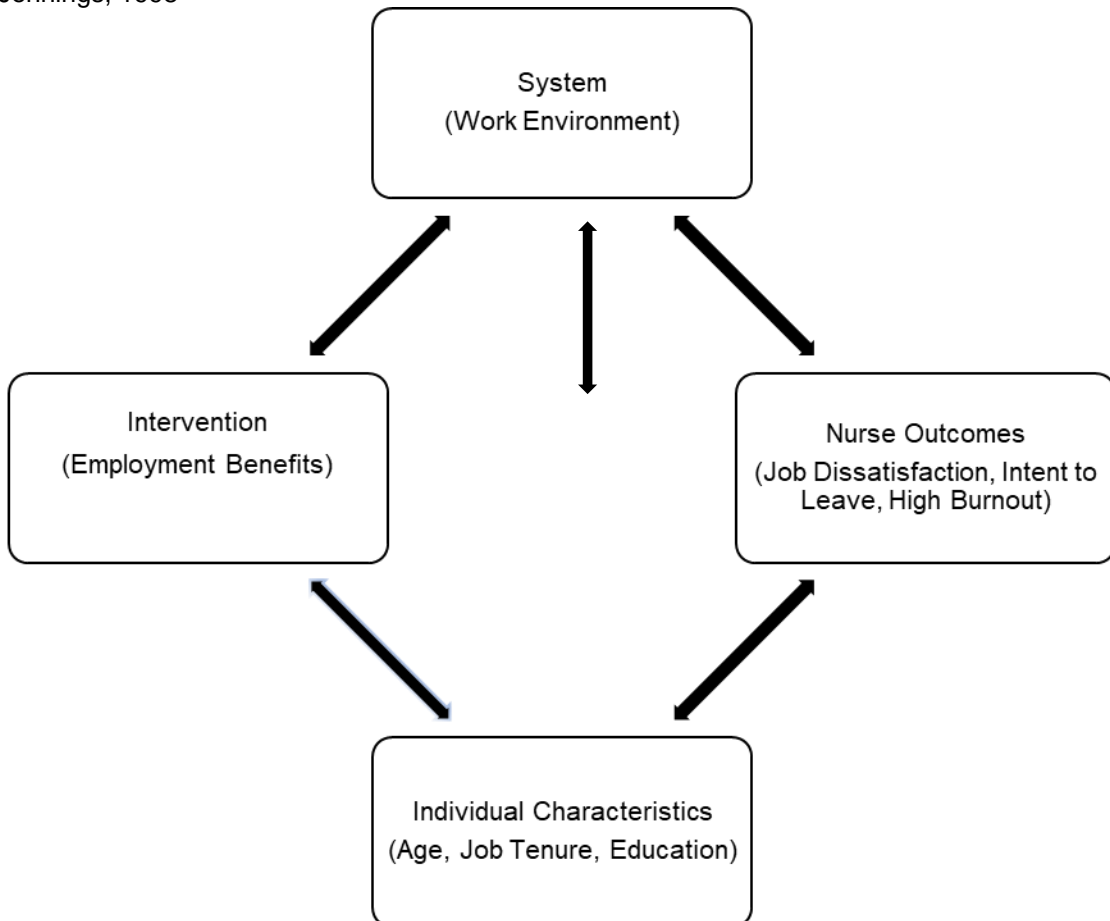
Job satisfaction, as a nurse outcome, has not been well studied in public health nurses or studied in a comparative framework including the two derivative nurse specialties, school nursing and home health nursing. And no studies to date have considered the association between job satisfaction among PHN and the work environment. While there are some studies about job satisfaction, there are very few on burnout and job retention. This dissertation will provide new evidence on job satisfaction and nurse outcomes for public health nurses compared to home care and school nurses in the current context using 2015-16 survey data from four large states.

### **Conceptual Model**

The conceptual model guiding this study is the Quality Health Outcomes Model (Mitchell, Ferketich, & Jennings, 1998). The Quality Health Outcomes Model (QHOM) expands on the structure, process, outcome model of Donabedian (Donabedian, 1966). The QHOM posits that relationships between intervention and outcomes are mediated by the environment or system in

which care takes place and the characteristics of the client. This study seeks to determine the extent to which the nurse work environment affects the relationship between public health nursing and job satisfaction, burnout, and intent to leave. In this dissertation, four components of the QHOM will be studied. The intervention is employment benefits; the nursing work environment is the measure for the system component; individual characteristics will be measured by age, job tenure, and education; and the nurse outcomes measures are intent to leave, job satisfaction and burnout (Figure 1). This study will not consider how client characteristics (age, health status, poverty, etc.) contribute to nurse work outcomes.

Figure 1: Quality Health Outcomes Model for this study adapted from Mitchell, Ferketich, & Jennings, 1998



The work at CHOPR is and has been conducted with the premise that organizational characteristics and attributes of health care settings affect nurse outcomes and patient outcomes (Aiken, Smith, & Lake, 1994; Aiken, Sochalski, & Lake, 1997). Three studies specifically cited the QHOM (Vahey, Aiken, Sloane, Clarke, & Vargas, 2004; Kutney-Lee, Lake, & Aiken, 2009; Brooks-Carthon, Kutney-Lee, Sloane, Cimiotti, & Aiken, 2011) and two studies used the Process of Care and Outcomes Model (Lucero, Lake, & Aiken, 2009; Lucero, Lake, & Aiken, 2010), which integrated elements of the QHOM. In studying the association of nurse burnout and patient satisfaction, Vahey et. al. (Vahey, Aiken, Sloane, Clarke, & Vargas, 2004) measured the work environment (system), hospital and unit characteristics (system), nurse characteristics (system), nurse burnout (outcome) and intention to leave (outcome), patient satisfaction (outcome), and patient characteristics (patient) as control variables. A specific intervention was not explicated; however, modifiable organization characteristics were identified that could improve nurse and patient outcomes.

Kutney-Lee, Lake, and Aiken (2009) defined, operationalized, and measured nurse surveillance capacity and its ability to predict quality of care and adverse events using the QHOM. In this study, nurse surveillance capacity was operationalized as nurse characteristics, such as staffing, education, years of experience, clinical expertise (system), and practice environment (system). The outcomes were nurse rated quality of care, falls, and nosocomial infections. In this study, the intervention, nurse surveillance was identified, and purposefully not measured, and patient characteristics were not measured.

In a study of quality of care and patient satisfaction, two components of the QHOM, system and outcome, were used (Brooks-Carthon, Kutney-Lee, Sloane, Cimiotti, & Aiken, 2011). System component measures were concentration of black patients, nursing characteristics, hospital characteristics, and the practice environment. The outcome component measures were nurse assessed quality of care, health care associated infections, three items from the Hospital Consumer Assessment of Healthcare Providers and Systems. In all three studies, hypothesized relationships of the QHOM have been tested without measures for the four components. While all

four components of the QHOM will be used and measured in this study, the focus is nurse outcomes, without a measure for patient outcomes.

## **Chapter 3: Methods**

### **Design**

This study is a cross-sectional secondary analysis of survey data from nurses in four states in 2015-16. The specific aims of the proposed study are:

1. To compare nurse job outcomes including job satisfaction, burnout, and intent to leave, of public health nurses with nurses that share historical roots with public health nurses, specifically school nurses (SN) and home health nurses (HHN).
2. To determine the extent to which modifiable features of the work environment including employment benefits are associated with favorable job outcomes for public health nurses.

### **Data Sources**

The data set for this dissertation is the RN4CAST-US collected by the Center for Health Outcomes and Policy Research at the University of Pennsylvania School of Nursing with funding from the National Institute of Nursing Research (NINR) and collected from 2015 to 2016. The level of analysis is the individual nurse. The survey was sent to a thirty percent random sample of registered nurses holding an active license in California, Florida, New Jersey, and Pennsylvania. The surveys were mailed to the selected nurses' homes. The nurses were asked to identify their employer to allow for the aggregation of nurses by employer and employment setting. Information from the survey included questions about nurses' characteristics, such as education and experience, features of the work environment, including benefits, salary adequacy, nurse manager expertise, team functioning, managerial support, and measures of nurse burnout, job satisfaction, and intent to leave current job. Nurses were also asked questions about the quality of clinical care.

### **Study Population**

The RN4CAST-US consisted of data from 59,972 completed questionnaires. The study population is home health nurses (n=3,099), public health nurses (n=566), and school nurses (n=1,343) for a total sample of 5,008 registered nurses. The survey asked for nurses to identify



their role as hospital or non-hospital nurse. The non-hospital nurses were asked to categorize their role by work setting, such as long-term care, home health, private physician/NP practice, nurse managed clinic, retail clinic or urgent care, dialysis center, community clinic, public health, school nurse, correctional facility, mental health center, nursing school, pharmaceutical/medical products/insurance, occupational/employer health, and other non-hospital setting. In addition, nurses were asked to write in the name of the facility of their non-hospital employer. This survey was mailed to nurses at home, a technique which should reduce sampling bias that might accompany sampling through an organization or employer (Aiken, et al., 2011).

### **Study Variables and Measures**

#### **Outcomes.**

***Job dissatisfaction.*** Global job dissatisfaction will be measured by a single item with established predictive validity. The global question that measures job satisfaction is, “How satisfied are you with your primary job?” Potential responses are very satisfied, moderately satisfied, a little dissatisfied, and very dissatisfied. The responses were recoded into a dichotomous variable with very satisfied and a moderately satisfied given a value of zero, and very dissatisfied and a little dissatisfied were given a value of one. The predictive validity of this global measure has been established in previous research in hospitals (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002), nursing homes (Choi, Flynn, & Aiken, 2012), and home health care settings (Jarrin, Flynn, Lake, & Aiken, 2014). This is the first study that will use the job satisfaction measure as an outcome for public health nurses.

***Intent to leave.*** Intent to leave was measured by a one question which asks, “Do you plan to be with your current employer one year from now?” The item response is yes or no, and coded into one for yes and zero for no.

***Burnout.*** The Maslach Burnout Inventory Emotional Exhaustion subscale measures burnout. The emotional exhaustion subscale of the Maslach Burnout Inventory is measured by a 9-item scale which asks the respondent to rate how often a feeling is present with ratings from never, a few times year, once a month or less, a few times a month, once a week, a few times a

week, or every day. The Likert-type scale is scored from 0 for never to 6 for every day. Those nurses who scored above the median,  $\geq 27$  were considered to have high burnout (Maslach & Jackson, 1981; Cimiotti, Aiken, Sloane, & Wu, 2012). This variable was a dichotomous variable with the nurses who scored  $\geq 27$  coded as “yes” for high burnout, and those who scored below 27 coded “no” for high burnout.

**System: Work environment.**

***Nurse practice environment.*** The PES-NWI measures the nursing practice environment, which is defined as “the organizational characteristics of a work setting that facilitate or constrain professional nursing practice (Lake, 2002, p. 178).” The PES-NWI consists of 31 items and five subscales: nurse participation in organizational affairs, nursing foundations for quality of care, nurse manager ability, leadership, and support of nurses, staffing and resource adequacy, and collegial nurse-physician relations. This variable was measured as a composite score on and subscale scores as continuous measures. The PES-NWI is a reliable and valid measure of the practice environment at the individual and organization level (Lake, 2002; Lake, 2007; Gabriel, Erickson, Moran, Diefendorff, & Bromley, 2013).

**Intervention: Employment Benefits.**

***Retirement benefit.*** The variable is a dichotomous variable, yes or no, about whether the employer offered any retirement or pension plan.

***Aspects of job dissatisfaction.*** Additional information collected on specific aspects of job satisfaction included work schedule, opportunities for advancement, independence at work, professional status, salary/wages, health care benefits, retirement benefits, and tuition benefits (McHugh, Kutney-Lee, Cimiotti, & Aiken, 2011). The response options for the additional items are very satisfied, moderately satisfied, a little dissatisfied, and very dissatisfied. The four categories were collapsed into dichotomous measures such that satisfied would include the categories of very satisfied and moderately satisfied, coded as zero, and dissatisfied would include a little dissatisfied and very dissatisfied, coded as one.

**Individual Characteristics**

**Job tenure.** One question measured job tenure, “How many years have you worked in your current organization.” The item response is a number and is continuous.

**Bachelor’s degree or higher.** This variable is a dichotomous variable, yes, or no. The variable was coded yes if the highest level of education completed in nursing was a Baccalaureate, Master’s, Doctor of Nursing Practice, PhD, or another doctorate.

**Age.** This variable is continuous. The respondent was asked, “What is your age?”.

#### **Other Variables**

**Type of nurse (PHN, SN, HHN).** Non-hospital nurses were asked to identify their setting for their primary job. Those nurses who marked public health nurse (PHN), school nurse (SN) and home health nurse (HHN) are included in this dissertation.

### **Analysis Plan**

#### **Specific Aim 1.**

Descriptive statistics and tabulation data were used to compare nurse outcomes including job satisfaction, burnout, and intent to leave of public health nurses with school nurses and home health nurses. The data was sorted by category of nurse (PHN, SN, HHN) with the variables global job satisfaction, job satisfaction with specific aspects, burnout, intent to leave current job in a year, job tenure, age, and bachelor’s degree or higher. The variable job tenure is a continuous variable. Test statistics for differences across groups were evaluated for magnitude and statistical significance. Graphical data visualizations were produced to examine and compare differences in the nurse outcomes across the different types of nurses.

#### **Specific Aim 2.**

The second aim of this study was to determine the extent to which the quality of the work environment and employment benefits are associated with differences in favorable job outcomes for public health nurses compared to nurses in other settings.

Achieving this aim will answer questions related to three nurse outcomes: 1) Is nurse intent to leave associated with retirement benefits, given work environment, nurse type and nurse characteristics; 2) are nurses dissatisfied given retirement benefits, work environment, nurse type

and nurse characteristics; and 3) do nurses experience high burnout given retirement benefits, work environment, nurse type and nurse characteristics?

Logistic regression models were used to estimate the likelihood of the nurse outcomes separately, which are dichotomous variables, based on retirement benefits and work environment as system variables, type of nurse, and individual nurse characteristics.

$$L_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \beta_4 X_{i4} + \beta_5 X_{i5} + \beta_6 X_{i6} + \beta_7 X_{i7}$$

Where  $L_i$  equals nurse outcome, either job satisfaction, burnout, or intention to leave in current job, and  $\beta_0$  is the intercept,  $X_{i1}$  equals the PES-NWI score,  $X_{i2}$  equals the presence of retirement benefits or pension,  $X_{i3}$  is the indicator variable for public health nurse,  $X_{i4}$  is the indicator variable for school nurse,  $X_{i5}$  is a variable for job tenure,  $X_{i6}$  is a variable for age,  $X_{i7}$  is a dichotomous variable for BSN or higher, and  $\beta_1$  to  $\beta_7$  are the coefficients to the given variable. This model allows for measurement of a mediated relationship between system component, or work environment, and type of nurse adjusting for nurse characteristics. Since the QHOM proposes a relationship between the intervention and the system components, and its effect on nurse outcomes, a model including both components and interaction variables from the intervention component and system component were tested in the model for nurse outcomes. The interactions answer questions about conditional effects of work environment factors given employment benefits. For example, an interaction model can determine whether the relationship between work environment and the nurse outcome differs based on the type of nurse.

$$L_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} X_{i1} + \beta_4 X_{i4} X_{i1} + \beta_5 X_{i3} X_{i2} + \beta_6 X_{i4} X_{i2}$$

### Summary

Existing evidence suggests that public health nurses are declining in actual and relative numbers and that their roles in healthcare have become more circumscribed over time as home care and school health specialties have evolved. Public health nurses contribute to population health in ways not fully covered by nurses in other specialties and settings. Thus, for future workforce planning it is important to understand the factors likely to play a role in the recruitment

and retention of the future public health nursing workforce. The proposed study builds upon nurse outcomes research and offers innovation in several ways. It provides the most current large-scale snapshot of workforce outcomes for public health nurses. It evaluates nurse workforce outcomes for public health nurses in the broad context of comparisons with two derivative specialties from public health nursing—home care and school health—that have grown in size and practice scope over the same period that public health nursing has declined in numbers and practice scope. The study investigates the association between detailed aspects of the work environment of these three types of nurses that has not been attempted previously. The results of the proposed study offer the possibility for identifying strategies that could stabilize the public health nurse workforce into the future.

## Chapter 4: Results

### Descriptive Data

This sample included nurses who identified themselves as public health nurses, school nurses, and home health nurses. Public health nurses comprised 11% of the sample, school nurse 25%, and home health nurses 64%. Seventy-three percent of PHN had a bachelor's degree or higher and 75% of school nurses reported a bachelor's degree in nursing or higher. In contrast, only 47% of HHN reported a bachelor's degree in nursing or higher. The average age of the sample is 54 years old, and public health nurses were significantly younger with an average age of 52.6 years. Average tenure in the current job for the group was about 9 years and PHN and SN reported significantly longer tenure with 11 years, and HHN reported less job tenure with 7.7 years.

Table 1: Characteristics of Public Health Nurses, School Nurses, and Home Health Nurses

	Public Health Nurse	School Nurse	Home Health Nurse	PHN, SN, HHN
N	529	1208	3079	4816
	N	N	N	
	(% within group)	(% within group)	(% within group)	
BSN or higher	384* (73%)	900* (75%)	1448* (47%)	2732
	Mean	Mean	Mean	
	(SD)	(SD)	(SD)	
Age	52.58** (11.13)	54.5 (9.96)	54.06 (11.40)	54.02 (11.04)
Job Tenure	11.06** (8.57)	11.00** (7.85)	7.65** (8.11)	8.87 (8.25)

\*  $\chi^2$  is significant,  $p. < 0.05$  compared to PHN, SN, HHN;

\*\*t-test is significant,  $p. < 0.05$  compared to PHN, SN, HHN

### Bivariate Analysis

Fifteen percent of nurses were dissatisfied with their job, 14% intended to leave their job within a year, and 25% reported high burnout. Public health nurse responses were not significantly different than the sample. School nurses reported less job dissatisfaction, intended to

stay in the jobs, and experienced less burnout. Home health nurses reported significantly more job dissatisfaction, intent to leave, and burnout.

Table 2: Percentage Reporting Adverse Nurse Outcomes by Type of Nurse

	Public Health Nurse	School Nurse	Home Health Nurse	PHN, SN, HHN
High Burnout	21%	17%*	27%*	25%
Job Dissatisfaction	14%	9%*	18%*	15%
Intent to Leave	13%	9%*	16%*	14%

\*  $\chi^2$  is significant,  $p. < 0.05$

The five domains of the work environment (participation in organizational affairs, nursing foundations for quality of care, nurse manager ability, leadership, and support of nurses), staffing and resource adequacy, collegial nurse-physician relations, and the global score of the Practice Environment Scale (PES) were compared across PHN, SN, and HHN, using a T-test (Table 3). Less than half of all public health nurses (47%) and school nurses (38%) completed the Practice Environment Scale of the survey; approximately 70% of home health nurses completed the PES. The composite score for the PES was 2.94 for the sample. A higher score reflected a better work environment as rated by the individual nurse. The composite score was 2.9 for PHN, 2.78 for SN, which was significantly lower, and 2.97 for HHN, which was significantly higher. Public health nurses rated nursing foundations for quality care significantly lower than the sample. School nurses rated the five domains significantly lower than the average, and HHN rated the five domains significantly higher than the average.

Table 3: Practice Environment by Nurse Type, mean (SD)

Practice Environment Scale	Public Health Nurse	School Nurse	Home Health Nurse	PHN, SN, HHN
Participation in Organizational Affairs	2.59 (0.73)	2.42* (0.72)	2.64* (0.78)	2.60 (0.77)
Nurse Foundations for Quality of Care	3.0* (0.63)	2.97* (0.57)	3.17* (0.59)	3.12 (0.60)

Nurse Manager Ability, Leadership, and Support of Nurses	2.97 (0.79)	2.81* (0.86)	3.07* (0.79)	3.02 (0.81)
Staffing and Resource Adequacy	2.81 (0.75)	2.77* (0.82)	2.86* (0.79)	2.84 (0.79)
Collegial Nurse-Physician Relations	3.13 (0.68)	2.94* (0.72)	3.15* (0.67)	3.11 (0.68)
Global	2.9 (0.58)	2.78* (0.60)	2.97* (0.60)	2.94 (0.60)

\*t-test is significant compared to sample of PHN, SN, HHN,  $p < 0.05$

In the eight areas of job dissatisfaction (Table 4), public health nurses were significantly less dissatisfied with their work schedule, healthcare benefits, retirement benefits, and tuition benefits. Work schedule, independence at work, healthcare benefits, retirement benefits, and tuition benefits were areas of significantly less dissatisfaction for school nurses. Areas of more dissatisfaction for school nurses were opportunities for advancement, professional status, and salary/wages. Home health nurses were significantly less dissatisfied with opportunity for advancement, professional status, and salary/wages. Areas of significantly greater dissatisfaction for home health nurses were work schedule, healthcare benefits, retirement benefits, and tuition benefits. Public health nurses were least dissatisfied with employment benefits such as healthcare benefits, retirement benefits, and tuition benefits. In contrast, HHN nurses were most dissatisfied with employment benefits, such as healthcare benefits (52%), retirement benefits (63%), and tuition benefits (62%).

Table 4: Areas of Dissatisfaction with Aspects of the Job by Nurse Type, number (percentage)

Areas of dissatisfaction	Public Health Nurse	School Nurse	Home Health Nurse	PHN, SN, HHN
Work Schedule	28* (9%)	32* (3%)	457* (15%)	517 (11%)
Opportunity for Advancement	204 (40%)	526* (46%)	1132* (38%)	1862 (40)



Independence at Work	33 (6%)	42* (3%)	161 (5%)	236 (5%)
Professional Status	58 (11%)	182* (15%)	322* (11%)	562 (12%)
Salary/Wages	227 (44%)	507* (42%)	1167* (39%)	1901 (40%)
Healthcare Benefits	92* (18%)	325* (28%)	1494* (52%)	1911 (42%)
Retirement Benefits	130* (25%)	369* (32%)	1828* (63%)	2327 (51%)
Tuition Benefits	241* (49%)	619* (56%)	1722* (62%)	2582 (59%)

\*  $\chi^2$  is significant,  $p < 0.05$

Responses to all questions related to retirement benefits were sorted by nurse type and summarized in detail in Table 5. Seventy-three percent of employers offered nurses a retirement plan. Public health nurses reported the highest percentage with 94%, and school nurses reported 86%. HHN reported that 64% of employers offered retirement plan. Only 13% of HHN participated in a pension plan, whereas 66% of PHN, and 63% of SN participated in a pension plan. In addition to a pension plan, 56% of HHN participated in a retirement plan for a combined participation percentage of 69%. Ninety-one percent of PHN and 88% of school nurses participated in a pension plan and/or a retirement plan.

Table 5: Retirement Benefits, Plans, and Participation by Nurse Type, percentage

	PHN	SN	HHN	PHN, SN, HHN
Employer offers a pension or retirement plan: Yes	94%*	86%*	64%*	73%
Type of Retirement plan offered	*	*	*	
Pension	31%	35%	3%	16%

Retirement plan	24 %	23%	74%	52%
Both	43%	35%	13%	23%
Don't know	3%	7%	11%	8%
<hr/>				
Are you eligible to participate?	*	*	*	
Yes	91%	87%	81%	84%
No, part time	4%	6%	10%	8%
No, not work long enough	4%	3%	4%	4%
Don't know	1%	4%	5%	4%
<hr/>				
Currently participate in company retirement plan	*	*	*	
Pension	37%	35%	4%	17%
Retirement Plan	24%	22%	55%	41%
Both	29%	28%	9%	17%
Yes-don't know which	1%	3%	1%	2%
No	7%	10%	30%	21%
Don't know	1%	2%	2%	2%
<hr/>				
Employer Contribute to Retirement Plan	*	*	*	
Yes	80%	60%	67%	67%
No	13%	24%	16%	18%
Don't know	8%	15%	17%	15%
<hr/>				
Retain Employer Contribution	*	*	*	
Yes	57%	47%	37%	43%
No	20%	21%	26%	24%
N/A	5%	8%	14%	11%
Don't know	18%	25%	22%	22%

\*  $\chi^2$  is significant,  $p. < 0.05$

### Logistic Regression Models

Logistic regression models (Table 6) were estimated for the three nurse outcomes (separately) with the work environment (PES) as the predictor variable, unadjusted and adjusted for age, job tenure, and having a bachelor's or higher. For unadjusted models, a better work environment was a significant predictor of reduced likelihood of poor nurse outcomes. For the nurse outcomes, all else being equal, a one-point increase of the composite score of the PES was associated with an 82% reduction in high burnout, an 86% reduction in job dissatisfaction, and a 71% reduction in intent to leave the current job within a year.

Table 6: Odds Ratio of Nurse Outcomes with PES, Unadjusted and Adjusted, odds ratio [95% CI]

Nurse Outcome Measure	Unadjusted PES	Adjusted PES
High Burnout	0.18*	0.18*
	[0.15, 0.22]	[0.15, 0.22]
Job Dissatisfaction	0.14*	0.14*
	[0.12, 0.18]	[0.11, 0.17]
Intent to Leave	0.29*	0.28*
	[0.24, 0.35]	[0.23, 0.34]

\*Odds ratio is significant,  $p. < 0.05$ ; adjusted by age, job tenure, and bachelor's degree

Table 7 represents a logistic regression testing the likelihood of adverse nurse outcomes for public health nurses and school nurses compared to home health nurses. The adjusted model controlled for age, job tenure, and having a bachelor's degree or higher. Work environment was added into the model to test the odds of adverse nurse outcomes by type of nurse. Controlling for work environment resulted in an increased reduction in the likelihood of three adverse events for school nurses and reduced likelihood for burnout for public health nurses. Public health nurses and school nurses had significantly reduced odds of high burnout by 46% and 65%, compared to home health nurses. Public health nurses were not significantly different than home health nurses for their likelihood of job dissatisfaction and intent to leave. However, school nurses were

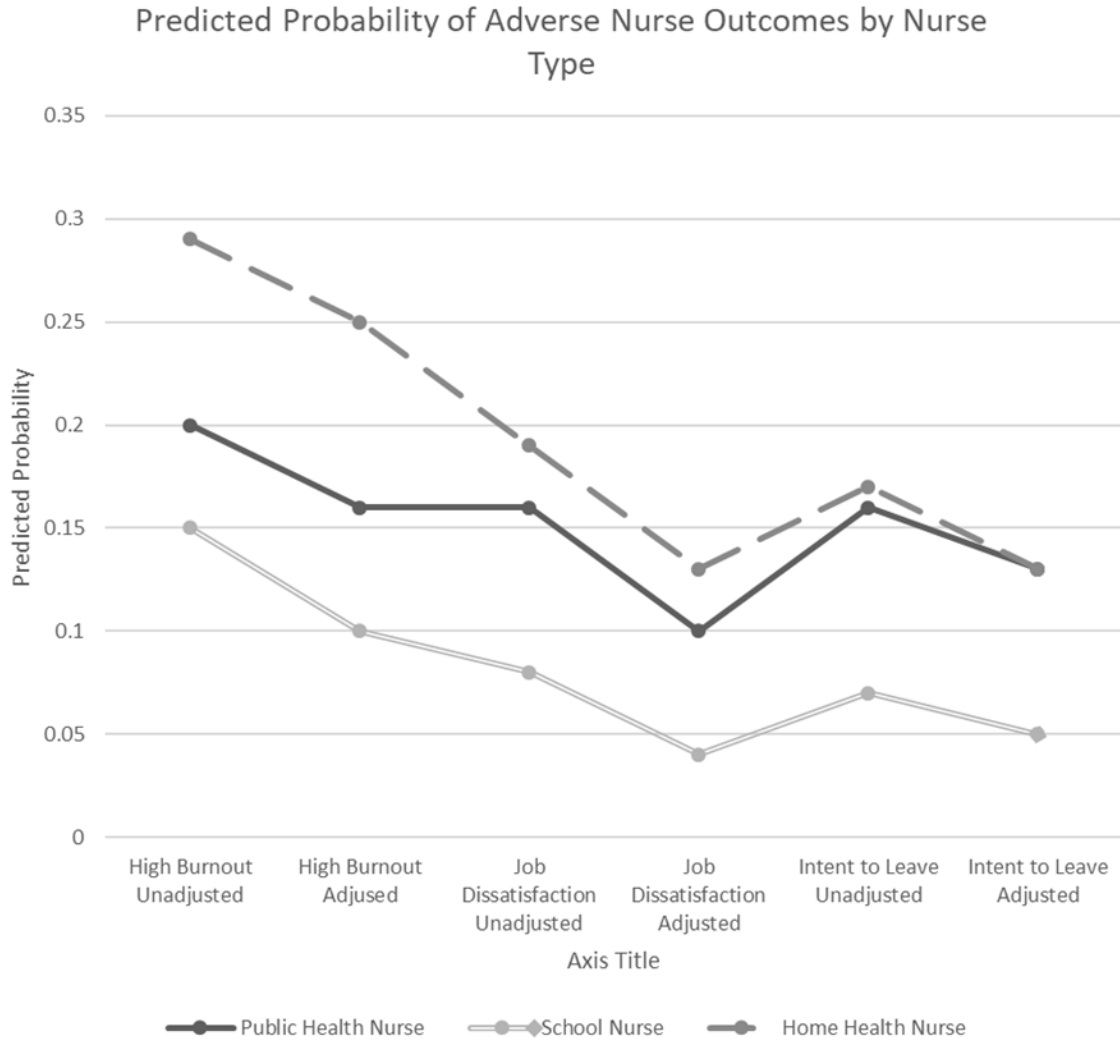
associated with significantly reduced odds of job dissatisfaction (73%) and intent to leave (64%) compared to home health nurses.

Table 7: Odds Ratio of Nurse Outcomes with Nurse Type as Predictor, controlling for PES, Adjusted by Age, Job Tenure, Bachelor's Degree, or Higher, odds ratio [95% CI]

Nurse Outcome Odds Ratio by Nurse Type	Unadjusted	Adjusted	PES	PES Adjusted
<b>High Burnout</b>				
PHN	0.71*	0.65*	0.59*	0.54*
	[0.51, 0.98]	[0.46, 0.91]	[0.41, 0.84]	[0.38, 0.80]
SN	0.54*	0.52*	0.36*	0.35*
	[0.42, 0.71]	[0.40, 0.68]	[0.27, 0.48]	[0.25, 0.47]
<b>Job Dissatisfaction</b>				
PHN	0.78	0.76	0.72	0.74
	[0.60, 1.02]	[0.58, 1.01]	[0.48, 1.08]	[0.49, 1.14]
SN	0.45*	0.47*	0.24*	0.27*
	[0.36, 0.56]	[0.38, 0.60]	[0.17, 0.36]	[0.18, 0.40]
<b>Intent to Leave</b>				
PHN	0.74*	0.78	0.81	0.97
	[0.56, 0.98]	[0.58, 1.04]	[0.55, 1.20]	[0.65, 1.46]
SN	0.52*	0.54*	0.31*	0.36*
	[0.42, 0.65]	[0.43, 0.68]	[0.21, 0.45]	[0.25, 0.54]

\*Odds ratio is significant,  $p. < 0.05$  with home health nurse as reference group

Figure 2: Predicted Probability of Adverse Nurse Outcomes by Nurse Type, Unadjusted and Adjusted at Means of PES, Age, Job Tenure, and Bachelor's Degree or Higher



In Table 8 and Figure 2, the predicted probability of each nurse outcome was calculated by nurse type using the logistic regression model represented in Table 7 and using the “margins” command in STATA. The adjusted predicted probability was calculated using the logistic regression in Table 7, with work environment, age, job tenure, and having a bachelor’s degree or higher at the respective variables’ mean for the sample by each nurse type. For the adjusted model, the probability for high burnout for public health nurses is 16%, for school nurses 10%, and for home health nurses is 25%. The probability for job dissatisfaction is 10%, 4%, and 13%

for PHN, SN, and HHN, respectively. The probability of planning to leave the job within a year for public health nurses was 13%, for school nurses was 5%, and for home health nurses was 13%. The probability of each of the three adverse nurse outcomes was highest for the home health nurses and was lowest for school nurses. The predicted probability for public health nurses was similar to the probability for home health nurses for job dissatisfaction and intent to leave.

Table 8: Predicted Probability of Adverse Nurse Outcomes by Nurse Type, Unadjusted and Adjusted at means of PES, Age, Job Tenure, and Bachelor's Degree or Higher, probability [95% CI]

	Public Health Nurse	School Nurse	Home Health Nurse
High Burnout			
Unadjusted	0.20*	0.15*	0.29*
	[0.15, 0.25]	[0.12, 0.18]	[0.27, 0.31]
Adjusted	0.16*	0.10*	0.25*
	[0.11, 0.20]	[0.08, 0.13]	[0.23, 0.27]
Job Dissatisfaction			
Unadjusted	0.16*	0.08*	0.19*
	[0.12, 0.20]	[0.05, 0.10]	[0.18, 0.21]
Adjusted	0.10*	0.04*	0.13*
	[0.07, 0.14]	[0.03, 0.06]	[0.12, 0.15]
Intent to Leave			
Unadjusted	0.16*	0.07*	0.17*
	[0.12, 0.21]	[0.05, 0.10]	[0.15, 0.18]
Adjusted	0.13*	0.05*	0.13*
	[0.09, 0.18]	[0.03, 0.07]	[0.12, 0.15]

\*Predictive probability,  $p. < 0.001$

Additional logistic regression models were run for the three nurse outcomes with the type of nurse as a variable (PHN, SN, HHN), an interaction term of the type of nurse and the work environment variable, and adjusted for age, job tenure, and having a bachelor's degree in nursing or higher. Regardless of nurse type, the work environment was a significant predictor of reduced odds of adverse nurse outcomes in the 9 models, and one model had a significant interaction of

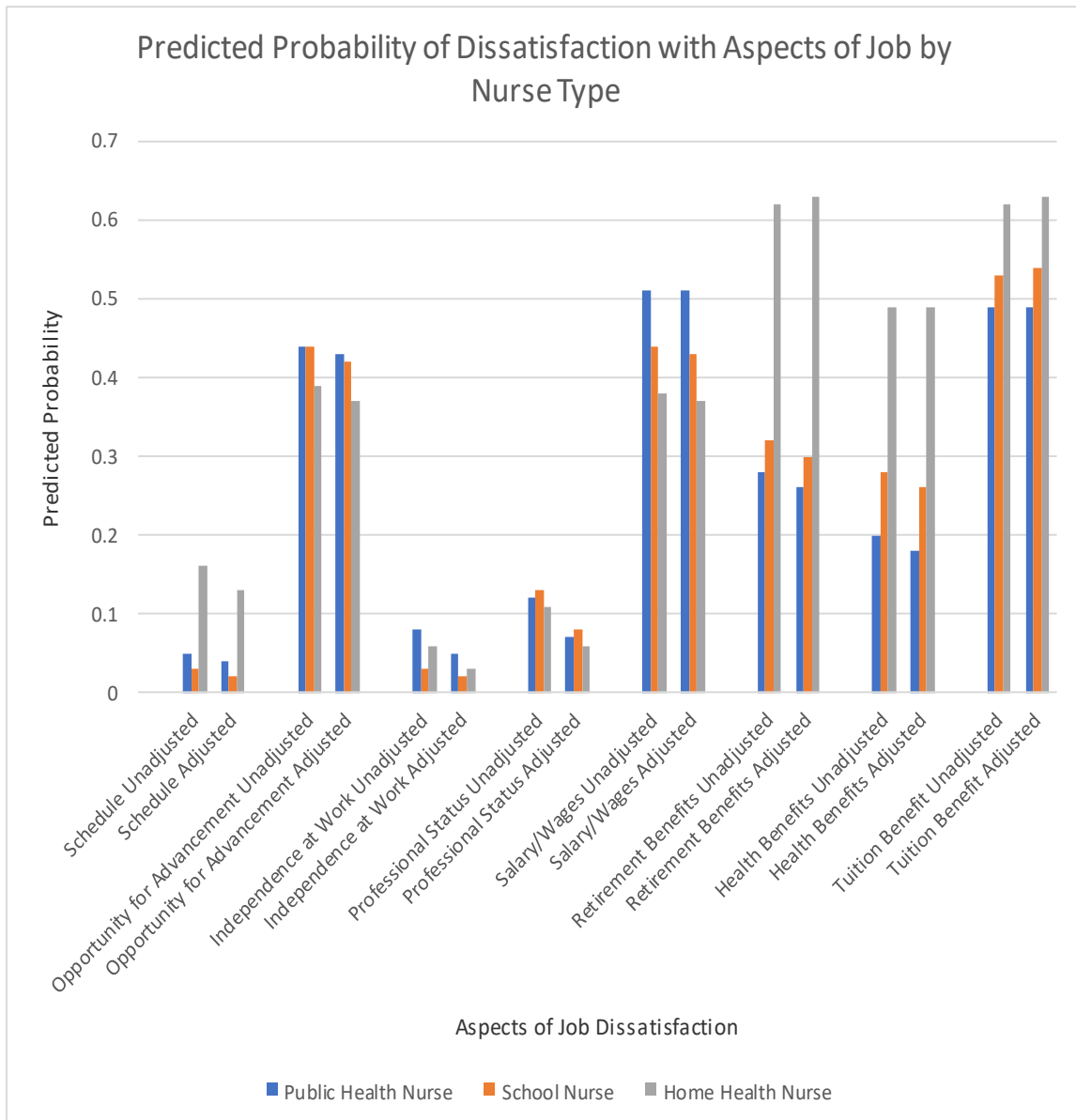
work environment and nurse type. Of the 9 logistic regression models, the model for the outcome, intent to leave given home health nurse and work environment had a significant interaction term for the two variables, as shown in Table 9. The odds of home health nurses leaving their job in a year was 700% higher than non-home health nurses. The work environment for the sample reduced the odds of leaving the job by 58%. In addition, for each one-point increase in the composite score of the work environment for home health nurses (interaction term) was associated with a reduction in intent to leave by 43%. In this analysis, even though home health nurses experienced the highest odds of reporting adverse nurse outcomes, the better the work environment for home health nurses reduced the likelihood of leaving.

Table 9: Odds Ratio of Nurse Outcomes with Home Health Nurse, PES, HHN x PES, Adjusted by Age, Job Tenure, and Bachelor's Degree or Higher, odds ratio [95%]

Nurse Outcome Odds Ratio by Nurse Type	Home Health Nurse	PES	HHN x PES
High Burnout	1.17 [0.35, 3.95]	0.13* [0.09, 0.20]	1.34 [0.84, 2.13]
Job Dissatisfaction	6.00* [1.59, 22.60]	0.17* [0.10, 0.26]	0.70 [0.41, 1.18]
Intent to Leave	8.07* [2.24, 29.05]	0.42* [0.28, 0.65]	0.57* [0.35, 0.91]

\*Odds ratio is significant,  $p. < 0.05$  with public health nurse and school nurse as reference group

Figure 3: Predicted Probability of Dissatisfaction with Aspect of Job by Nurse Type, Adjusted at means of PES, Age, Job Tenure, and Bachelor's Degree or Higher



The predicted probability of dissatisfaction with aspects of job by nurse type is reported in Table 10 and illustrated in Figure 3. The predicted probability was calculated by using a logistic regression model with the aspect of the job as the dependent variable, and nurse type (PHN, SN, HHN), work environment, age, job tenure, and baccalaureate degree in nursing or higher as independent variables. In addition, predicted probability was adjusted for each model by holding



the work environment composite score, age, job tenure, and bachelor's degree or higher at the mean. The probability for dissatisfaction with work schedule is 4% for PHN, 2% for SN, and 13% for HHN. All three types of nurses were dissatisfied with their opportunity for advancement, with the predicted probability of 44% for PHN, 42% for SN, and 37% for HHN. Public health nurses had the highest probability for dissatisfaction with salary at 51%, compared to SN at 44%, and HHN at 38%. Of the three employment benefits, all three categories of nurses report dissatisfaction with tuition benefits. The probability of dissatisfaction was 49% for PHN, 54% for SN, and 63% for HHN. Home health nurses had the highest probability for dissatisfaction with retirement benefits, and health benefits, 63% and 49%, respectively. In contrast, the probability for dissatisfaction with retirement benefits was 28% for PHN and 32% for SN. Public health nurses had the lowest probability for dissatisfaction with health benefits at 18% and SN at 26%.

Table 10: Predicted Probability of Dissatisfaction with Aspects of Job by Nurse Type, unadjusted and adjusted at means of PES, Age, Job Tenure, and Bachelor's Degree or higher, probability [95% CI]

	Public Health Nurse	School Nurse	Home Health Nurse
<b>Schedule</b>			
Unadjusted	0.05*	0.03*	0.16*
	[0.02, 0.08]	[0.01, 0.04]	[0.15, 0.18]
Adjusted	0.04*	0.02*	0.13*
	[0.01, 0.06]	[0.01, 0.03]	[0.11, 0.15]
<b>Opportunity for Advancement</b>			
Unadjusted	0.44*	0.44*	0.39*
	[0.38, 0.50]	[0.40, 0.48]	[0.37, 0.41]
Adjusted	0.43*	0.42*	0.37*
	[0.35, 0.50]	[0.37, 0.48]	[0.34, 0.39]
<b>Independence at Work</b>			
Unadjusted	0.08*	0.03*	0.06*
	[0.05, 0.11]	[0.02, 0.05]	[0.05, 0.07]

Adjusted	0.05*	0.02*	0.03*
	[0.02, 0.07]	[0.01, 0.03]	[0.03, 0.04]
<hr/>			
Professional Status Unadjusted	0.12*	0.13*	0.11*
	[0.08, 0.16]	[0.10, 0.16]	[0.10, 0.12]
Adjusted	0.07*	0.08*	0.06*
	[0.04, 0.10]	[0.05, 0.10]	[0.05, 0.07]
<hr/>			
Salary/Wages Unadjusted	0.51*	0.44*	0.38*
	[0.45, 0.57]	[0.39, 0.48]	[0.36, 0.40]
Adjusted	0.51*	0.43*	0.37*
	[0.44, 0.58]	[0.38, 0.48]	[0.35, 0.39]
<hr/>			
Retirement Benefits Unadjusted	0.28*	0.32*	0.62*
	[0.22, 0.34]	[0.28, 0.36]	[0.60, 0.64]
Adjusted	0.26*	0.30*	0.63*
	[0.20, 0.32]	[0.26, 0.35]	[0.61, 0.65]
<hr/>			
Health Benefits Unadjusted	0.20*	0.28*	0.49*
	[0.15, 0.25]	[0.24, 0.32]	[0.47, 0.51]
Adjusted	0.18*	0.26*	0.49*
	[0.13, 0.23]	[0.22, 0.30]	[0.47, 0.52]
<hr/>			
Tuition Benefits Unadjusted	0.49*	0.53*	0.62*
	[0.43, 0.56]	[0.49, 0.58]	[0.59, 0.64]
Adjusted	0.49*	0.54*	0.63*
	[0.42, 0.56]	[0.49, 0.59]	[0.60, 0.65]

\*Predictive probability,  $p. < 0.001$

Logistic regression models were also estimated to understand whether poor nurse outcomes were more pronounced for PHN, SN, and HHN, and if the work environment and pension participation mitigated poor outcomes. The model included a variable for nurse type, the work environment, pension participation, an interaction term of work environment times pension participation, age, job tenure, and education. Based on the logistic regression models, the predictive probability was calculated for each outcome by PHN, SN, and HHN. The probability is illustrated in Figure 4 and in Table 11. For these models, the probability for adverse nurse outcomes for PHN, SN, and HHN did not change much compared to the model represented in Table 8. There are a few differences. The probability that home health nurses experienced burnout was 33%. For intent to leave, public health nurses had the highest probability at 16%. School nurses had the lowest probability for reporting the three adverse nurse outcomes.

Figure 4: Predicted Probability of Adverse Nurse Outcomes by Nurse Type, PES, Pension Participation, and PES x Pension Participation, adjusted by Age, Job Tenure, and Bachelor's Degree or Higher

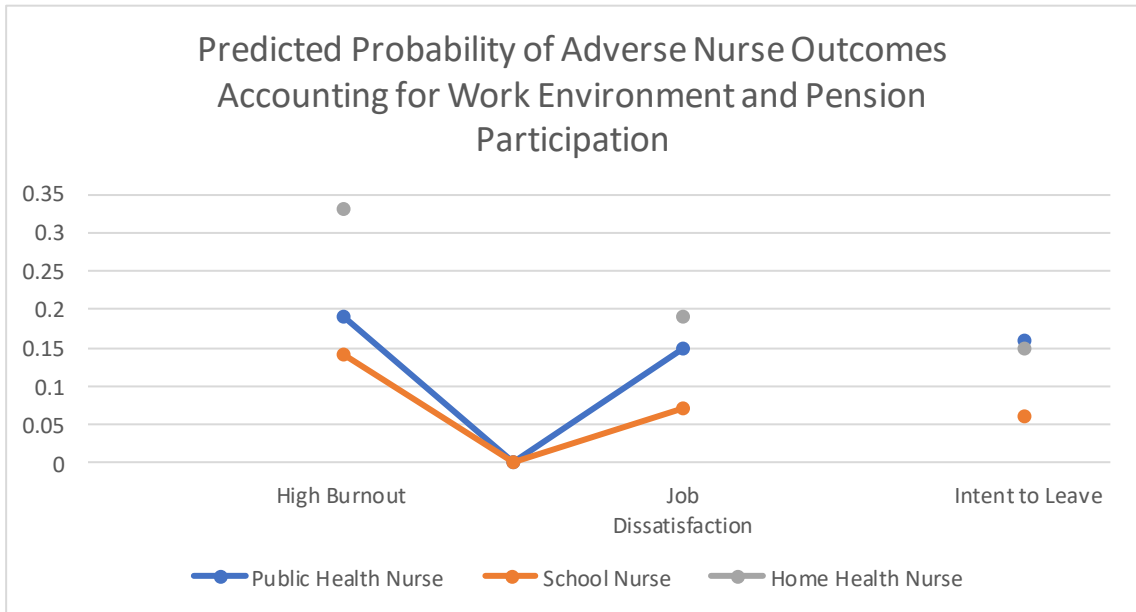


Table 11: Predicted Probability of Adverse Nurse Outcomes by Nurse Type, PES, Pension Participation, and PES x Pension Participation, adjusted by Age, Job Tenure, and Bachelor's Degree or Higher, probability [95% CI]

	Public Health Nurse	School Nurse	Home Health Nurse
High Burnout	0.19*	0.14*	0.33*
	[0.14, 0.24]	[0.10, 0.17]	[0.31, 0.35]
Job Dissatisfaction	0.15*	0.07*	0.19*
	[0.10, 0.19]	[0.04, 0.09]	[0.17, 0.21]
Intent to Leave	0.16*	0.06*	0.15*
	[0.11, 0.22]	[0.04, 0.09]	[0.13, 0.17]

\*Predictive probability,  $p. < 0.001$

Logistic regression models were also estimated to understand whether poor nurse outcomes were more pronounced for PHN, SN, and HHN, and if poor outcomes were linked with job dissatisfaction or with pension participation, adjusting for age, job tenure, and those with a bachelor's degree or higher. Table 12 shows the odds ratio for adverse nurse outcomes for PHN, SN, and areas of job dissatisfaction. Public health nurses did not have any significant relationship to adverse nurse outcomes. However, school nurses did have reduced odds for all three adverse nurse outcomes. Dissatisfaction with work schedule, opportunity for advancement and professional status were associated with increased odds of high burnout, job dissatisfaction, and intent to leave. Dissatisfaction with independence at work was associated with higher odds of burnout and job dissatisfaction. Dissatisfaction with salary increased the odds of job dissatisfaction and intent to leave.

Table 12: Odds Ratio of Adverse Nurse Outcomes by Nurse Type, Areas of Dissatisfaction with Aspects of Job, adjusted by Age, Job Tenure, and Bachelor's Degree or Higher, odds ratio [95% CI]

Nurse Type of Area of Dissatisfaction	High Burnout	Job Dissatisfaction	Intent to Leave
Public Health Nurse	0.74 [0.50, 1.08]	0.92 [0.66, 1.29]	0.85 [0.61, 1.18]
School Nurse	0.59* [0.44, 0.80]	0.48* [0.37, 0.64]	0.57* [0.44, 0.74]
Schedule	4.40* [3.37, 5.75]	4.61* [3.62, 5.86]	2.68* [2.11, 3.39]
Opportunity for Advancement	1.84* [1.49, 2.29]	3.01* [2.41, 3.75]	2.27* [1.84, 2.81]
Independence at Work	2.32* [1.54, 3.51]	2.26* [1.59, 3.21]	1.30 [0.92, 1.85]
Professional Status	1.97* [1.45, 2.67]	2.95* [2.30, 3.79]	2.32* [1.82, 2.97]
Salary/Wages	1.23 [0.99, 1.54]	1.78* [1.44, 2.12]	1.24* [1.01, 1.53]
Health Benefits	0.68* [0.53, 0.88]	1.15 [.90, 1.48]	1.21 [0.96, 1.54]
Retirement Benefits	1.34* [1.03, 1.74]	1.23 [0.94, 1.61]	1.16 [0.89, 1.50]
Tuition Benefits	1.07 [0.84, 1.36]	0.84 [0.66, 1.07]	1.21 [0.96, 1.54]

\*Odds ratio is significant,  $p. < 0.05$  with home health nurse as reference group

The logistic regression model in Table 13 adds work environment to the model in Table 12 and adjusts for age, job tenure, and bachelor's degree in nursing or higher. Adding in the work environment, being a public health nurse was associated with a 40% reduction in odds of high

burnout compared to HHN. The variables for school nurse and the work environment were associated with a reduction in the odds of all three adverse nurse outcomes. Being a school nurse reduced the odds of burnout by 57%, the odds of job dissatisfaction by 63%, and the odds of leaving current job within a year by 62%. All things being equal, each additional point on the PES composite was associated with a reduction in the odds of burnout by 78%, job dissatisfaction by 75%, and intent to leave by 54%. Dissatisfaction with the work schedule significantly increased the odds of adverse outcomes but the magnitude was not as great as the logistic regression in Table 12 without accounting for the work environment. In this model, dissatisfaction with opportunity for advancement and with professional status was associated with an increased likelihood of job dissatisfaction and intent to leave. Dissatisfaction with independence at work were associated with increased odds of high burnout and job dissatisfaction. Dissatisfaction with salary increased the odds of job dissatisfaction.

Table 13: Odds Ratio Nurse Outcomes, PES, and Areas of Dissatisfaction with Aspects of Job, adjusted for Age, Job Tenure, and Bachelor's Degree or higher, odds ratio [95% CI]

Predictor Variables	High Burnout	Job Dissatisfaction	Intent to Leave
Public Health Nurse	0.60* [0.39, 0.91]	0.81 [0.49, 1.30]	0.92 [0.57, 1.48]
School Nurse	0.43* [0.31, 0.60]	0.37* [0.24, 0.58]	0.38* [0.25, 0.59]
PES	0.22* [0.17, 0.27]	0.25* [0.19, 0.33]	0.46* [0.36, 0.59]
Schedule	3.66* [2.74, 4.88]	3.68* [2.72, 4.98]	2.35* [1.75, 3.16]
Opportunity for Advancement	1.08 [0.84, 1.37]	1.85* [1.39, 2.48]	1.81* [1.36, 2.40]
Independence at Work	1.65* [1.06, 2.57]	1.99* [1.27, 3.12]	1.14 [0.73, 1.77]

Professional Status	1.35 [0.96, 1.89]	1.91* [1.36, 2.70]	1.89* [1.35, 2.66]
Salary/Wages	1.11 [0.88, 1.41]	1.75* [1.32, 2.31]	1.17 [0.89, 1.53]
Health Benefits	0.60* [0.46, 0.79]	1.01 [0.73, 1.39]	0.92 [0.67, 1.26]
Retirement Benefits	1.28 [0.97, 1.70]	1.19 [0.84, 1.69]	0.94 [0.67, 1.32]
Tuition Benefits	1.01 [0.79, 1.31]	0.81 [0.59, 1.11]	1.30 [0.95, 1.77]

\*Odds ratio is significant,  $p. < 0.05$  with home health nurse as reference group

A variable for pension participation was added to the logistic regression model in Table 13 and presented in Table 14. Compared to home health nurses, public health nurses had lower odds of burnout and school nurses had lower odds of all three adverse nurse outcomes. The work environment was associated with a reduction of the odds of all three adverse nurse outcomes. Pension participation had no significant relationship to the adverse nurse outcomes. Dissatisfaction with work schedule and with professional status increased the odds of the three adverse nurse outcomes. Dissatisfaction with opportunity for advancement increased the odds of job dissatisfaction and intent to leave. Dissatisfaction with independence at work and salary increased the odds of job dissatisfaction. Employer benefits were largely not related to any adverse nurse outcomes, except for dissatisfaction with health benefits, which decreased the odds of burnout, and dissatisfaction with retirement benefits, which increased the odds of burnout. Consistent with the literature, job tenure decreased the likelihood of intent to leave the current position by 3%.

Table 14: Odds Ratio of Nurse Outcomes, PES, Pension Participation, and Areas of Dissatisfaction with Aspect of Job, adjusted by Age, Job Tenure, and Bachelor's Degree or Higher, odds ratio [95% CI]

Predictor Variables	High Burnout	Job Dissatisfaction	Intent to Leave
Public Health Nurse	0.49*	0.72	1.08
	[0.30, 0.78]	[0.40, 1.28]	[0.62, 1.86]
School Nurse	0.32*	0.30*	0.30*
	[0.21, 0.48]	[0.17, 0.52]	[0.17, 0.52]
PES	0.19*	0.25*	0.45*
	[0.15, 0.25]	[0.18, 0.34]	[0.33, 0.62]
Pension Participation	1.35	1.04	0.79
	[0.97, 1.88]	[0.68, 1.60]	[0.51, 1.22]
Schedule	3.75*	3.87*	2.39*
	[2.62, 5.36]	[2.67, 5.60]	[1.65, 3.46]
Opportunity for Advancement	1.09	1.62*	1.79*
	[0.82, 1.44]	[1.15, 2.29]	[1.26, 2.54]
Independence at Work	1.41	2.16*	1.14
	[0.83, 2.39]	[1.27, 3.67]	[0.66, 1.97]
Professional Status	1.77*	2.36*	2.15*
	[1.18, 2.66]	[1.55, 3.59]	[1.40, 3.28]
Salary/Wages	0.99	1.90*	1.30
	[0.75, 1.31]	[1.35, 2.67]	[0.93, 1.81]
Health Benefits	0.71*	0.99	0.92
	[0.51, 0.97]	[0.68, 1.45]	[0.63, 1.34]
Retirement Benefits	1.41*	1.08	0.76
	[1.03, 1.92]	[0.74, 1.59]	[0.52, 1.12]
Tuition Benefits	1.08	0.83	1.34
	[0.82, 1.42]	[0.58, 1.18]	[0.95, 1.89]



\*Odds ratio is significant,  $p. < 0.05$  with home health nurse as reference group

## Chapter 5: Discussion

This study compared the relationship between the work environment and important nurse outcomes including burnout, job dissatisfaction, and intent to leave across public health nurses, school nurses, and home health nurses. Although public health nurses, school nurses and home health nurses work in different environments, in this sample, a better work environment was associated with reduced likelihood for adverse nurse outcomes regardless of other variables added to the logistic regression models. The statistical significance of work environment and its association with a reduction in adverse nurse outcomes in this study adds to the literature of nurse work environment studies, which compared a type of work environment, such as a medical surgical unit, from one organization to another.

Two findings were expected. One is that public health nurses and school nurses would have a higher percentage of baccalaureate degrees compared to home health nurses. The other finding was that public health nurses and school nurses would have higher participation in a pension plan because their employers are a government entity or an education entity. The recommendation to have a bachelor's degree in nursing for entry into public health nursing practice has existed since 1952 (Roberts & Heinrich, 1985; Kulbok & Glick, 2014). The group with the highest percentage of baccalaureate degrees was school nurses. In two of the states surveyed, California and Pennsylvania, the three requirements to be a school nurse are licensure as a registered nurse, certification by the education department, and completion of a baccalaureate education or bachelor's degree in nursing. In New Jersey, registered nurses, or registered nurses with a baccalaureate degree, and certification by the education department are the criteria for being a school nurse. In Florida, the local school district may identify a licensed practical nurse or registered nurse as a school nurse (Praeger & Zimmerman, 2009). Like public health nurses, since 2011, a recommendation for entry into practice as a school nurse is a baccalaureate degree in nursing (NASN, 2013). Home health nurses do not have a comparable recommendation or requirement for educational preparation as entry into practice from their professional organization.

While participation in a pension plan was not a significant variable, the interaction term of pension participation and work environment (PES) resulted in a 33% probability of burnout for HHN, and 16% probability of intent to leave current job for PHN. In addition, dissatisfaction with retirement benefits significantly increased the likelihood of job dissatisfaction and intention to leave. PHN had the highest percentage of participation in pensions plans (66%) compared to SN, and HHN. Pension participation did not reduce job dissatisfaction or reduce intention to leave. Having a pension might seem like a potential recruitment and retention tool, especially as the nursing workforce ages. However, the relationship between pension plan participation and retention is complex. Defined benefit pension plans, which often require 25 to 35 years of services to receive a percentage of their salary in retirement, common in government employment, can encourage early retirement with the employee leaving the organization after their required years of service to collect the pension and possibly work at another organization (Rappaport, Bancroft, & Okum, 2003; Dychtwald & Baxter, 2007). The same incentive of a pension plan, to remain in a job for 25 to 35 years, can also result in a nurse staying in a job even if he or she is dissatisfied or unhappy. This study did not include any variables regarding plans to retire. With two exceptions, other employment benefits like healthcare benefits, retirement benefits and tuition benefits had no relationship to nurse outcomes. Other aspects of a job that are modifiable by the employer, such as work schedule, professional status, independence at work, salary/wages and opportunity for advancement, did have significant relationships to adverse nurse outcomes.

Although PHN and SN are both nurses employed by governmental entities, participate in retirement plans or pension plans, and experience satisfactory employment benefits, being a school nurse reduced the likelihood of the three adverse nurse outcomes while being a PHN only reduced the likelihood of high burnout. There were no significant differences between PHN and HHN for job dissatisfaction and intention to leave. School nurses had the lowest odds for experiencing adverse nurse outcomes despite having the lowest PES of the three groups. However, the work environment still had a significant effect on all adverse nurse outcomes

regardless of other variables or type of nurse. All things being equal, the better the work environment, the greater the reduction of burnout, job dissatisfaction, and intention to leave. These seemingly contradictory results highlight the difficulty of comparing three groups of nurses with three distinct work environments despite common historical roots.

In addition, less than half of public health nurses (46%) and school nurses (41%) completed the items to measure burnout in the survey. The PES was completed by 47% of PHN, 38% of SN, and 70% of HHN. The relatively lower completion rates for burnout and PES might be due to the instructions in the survey which asked the nurse to stop the survey if they did not work in a clinical setting. For those PHN and SN whose work environment might be in an office setting or school might not have completed the survey. Some PHN do clinical nursing outside of a clinic. School nurses work in a school which might not have a designated clinical area for the students. In contrast to public health nurses, home health nurses work in the community but also see their role as clinical. One possible conclusion is that public health nurses do not see their work with the community as clinical work, or as part of a clinical role.

School nurse rated their work environment significantly lower in all five domains of the Practice Environment Scale. The lowest rated area of the PES for school nurses was participation in organizational affairs. This low rating might be attributable to the structure of schools with local management consisting of principals, a local school board setting the direction of the school, and often a state board of education setting the curriculum and function of staff in all schools in a state. In addition, school nurses often are not considered part of the faculty and therefore do not have input into the school organization. Staff resource adequacy was the second lowest rated domain. Time spent with patients, in this case students, and number of school nurses is controlled by school administrators, boards of education, and budgets. School nurses also scored significantly lower in the domain of collegial-nurse physician relationship. Previous research has outlined school nurse communication with physicians and reported effectiveness and ineffectiveness (Volkman & Hillemeir, 2008).

Despite the lower rating on the work environment, school nurses had the lowest odds for adverse nurse outcomes. An explanation might be that school nurses work in an environment focused on education, not health care. School nurse might lack access to resources and have a non-nurse supervisor or a nurse manager located offsite. In addition, school nurses might have the most difficulty reaching a physician or other health care providers (Volkman & Hillemeir, 2008). However, there were enough other benefits to their job that offset the work environment, such as independence at work and a satisfactory schedule, with holidays off and generous vacation time during the summer. In addition, school nurses were more satisfied than home health nurses with their retirement and health benefits.

Home health nurses reported a work environment, measured by the PES, better than all other nurses employed in health care, public health nurses, and school nurses. The higher composite score is partly attributable to the high score for foundations of quality of care, nurse manager ability, leadership, and support of nurses and for staffing and resource adequacy. Home health nurses and home health agencies work within a regulatory environment and must meet national accreditation standards, as well as any state requirements. It is possible that regulatory requirements improved the rating because agency are required to have a quality improvement plan, maintain current care plans, and provide case management services for continuity of care. A potential ad-hoc study analysis could confirm these findings by sorting the home health nurse by organization and adding accreditation status. In contrast, school nurses and public health nurses do not work within a similar regulatory context.

Home health nurses reported the greatest dissatisfaction with work benefits or other areas of work compared to other nurses. Areas of dissatisfaction include work schedule, opportunities for advancement, salary/wages, healthcare benefits, retirement benefits, and tuition benefits. In the sample, over 50% of home health nurses reported dissatisfaction with healthcare benefits, and over 60% reported dissatisfaction with retirement benefits and tuition benefits. Public health nurses and school nurses often benefit from local, municipal, or state benefits to which home health nurses do not have access. Home health nurses also reported that only 64%

of their respective employers offer a pension or retirement plan, compared to 94% of public health nurses. While home health nurses experienced the greatest satisfaction from independence at work, professional status, and practice environment, they also reported the highest proportion of high burnout. Possible changes by the employer to improve the work environment include changes to the work schedule and possibly purchasing or supplementing better benefits for their employees.

Home health nurses might have a better work environment but have other reasons for job dissatisfaction, intention to leave, and emotional exhaustion not measured in this study. Reasons for job dissatisfaction might be the lack of interaction with a team, lack of a routine schedule and the need to work on call. Important areas to study about the work environment are the potential for violence, danger, or injury that a home health nurse might face daily, and the employer's promotion of a culture of safety for the home health nurse (Canton, et al., 2009). Other important areas for future studies of the work environment of home health nurses would be to measure the number of new graduates hired and the presence an internship for new registered nurses. Hiring new graduates and new registered nurses has been tested as a model to increase staffing at home health agencies (Coyle, 2011). Currently there is no recommendation for home health nurses to have a baccalaureate degree from their professional association. Subsequently, new graduates without a bachelor's degree or higher generally do not have a background in community health nursing. Another area of study would be to compare nurse outcomes and patient outcomes by education, presence of a mentorship program, and the exposure to didactic information about community health nursing.

Public health nurses rated their work environment at 2.9 versus 2.94 for the sample. There was no significant difference. On the subscale of the PES, public health nurses rated nursing foundations for quality of care significantly lower. The domain nursing foundations for quality of care includes items such as "a good orientation program for new employed nurses," "active staff development or continuing education programs for nurses," "high standards of nursing care are expected by the administration," "a clear philosophy of nursing that pervades the

patient care environment,” “the nurses I work with are clinically competent,” “an active quality improvement program,” up-to-date care plans for all patients,” and “patient care assignments that foster continuity of care.” The trend in public health nursing is moving away from the individual and family care to population care or community level care. The result is that public health nurses might be moving away from a nursing knowledge base to a public health knowledge base, which would explain the lower score in this domain for public health nurses. Previous studies have found the better the work environment for a nurse, the greater the reduction of adverse nurse outcomes (Aiken, Smith, & Lake, 1994; Aiken, Sochalski, & Lake, 1997; Aiken, et al., 2011). For nurses entering a field which does not have a nursing foundation, what are the factors that improve the work environment for nurses? It’s unknown if or how the changing scope of practice of public health nursing impacts recruitment and retention.

Reported job dissatisfaction, and intention to leave for public health nurses was not significantly different than all nurses in the sample. Public health nurses experienced significantly less burnout. Despite working in an office setting or clinic, and working specific hours with a routine work schedule, satisfaction in those areas of the job setting did not result in a significant difference in job dissatisfaction and intention to leave for PHN. Some areas of job dissatisfaction for public health nurses were consistent with findings in the literature. In this study, the probability of dissatisfaction with salary was 51% for public health nurses. Previous studies, as early as 1992, have found public health nurses were dissatisfied with their salary and this finding has not changed in over 25 years (Dunkin, Juhl, Stratton, Geller, & Ludtke, 1992; Juhl, Dunkin, Stratton, Geller, & Ludtke, 1993; Beall, Baumhover, Gillum, & Wells, 1994; Zahner & Gredig, 2005; Cole, Ouzts, & Stepan, 2010; Royer, 2011; Boulton & Beck, 2013). Forty three percent of PHN were dissatisfied with their opportunity for advancement; this is consistent with previous studies (Beall, Baumhover, Gillum, & Wells, 1994). However, PHN were least dissatisfied with their work schedule, healthcare benefits, and retirement benefits. A local, county, or state government employing PHN likely did not require shift work, offered a consistent schedule Monday through Friday, and PHN reaped the same benefits as other government employees. While PHN

experience the positive aspects of government employment, such as satisfactory work schedule and work benefits, the inability of government agencies to improve the salary and to create a career ladder are barriers to recruitment and retention. The findings also show that dissatisfaction with opportunity for advancement and dissatisfaction with professional status were significant predictor of intention to leave. Dissatisfaction with salary/wages, professional status, and opportunities for advancement were also significant predictors of job dissatisfaction. This is a cross sectional study and the longitudinal effects of relatively lower salary are unknown. One study has found that not only do PHN have lower salary, but that that salary gap grows during the same job tenure compared to hospital nurse (Issel, Lurie, & Bekemeier, 2016). To improve the nurse outcomes for PHN, improving salary, professional status within the organization, and improving opportunities for advance might also improve recruitment and retention.

Public health nursing originated from the need to provide hospital level care to individuals in their home, to provide nursing and education to families, and to target public health nursing activities with impoverish populations and within immigrant populations, towards the goal of improving the health in a neighborhood and within a community. Public health nursing is the practice of nursing and the practice of public health. With the progressive change from individual level interventions to population interventions, it is critical for public health nurses to establish the necessity of the nurse implementing a population function. As public health interventions focus on population health and socioeconomic disparities (Bekemeier, 2008) and the practice of public health core functions and essential services, there is a lack of identification of public health nursing interventions, separate from public health, which specifically necessitate the role of the nurse or the licensure of a nurse. A range of public health workers and practitioners can work on population health, public health, and health disparities, including community health workers, epidemiologist, and community activists. Compounding the issue of the necessity of public health nurses is the lack of research on public health nursing interventions and outcomes (Bigbee & Issel, 2012). In addition, there are gaps in funding to maintain needed public health services (Bekemeier, Marlowe, Squires, Tebaldi, & Park, 2017), which could lead to hiring less nurses to



maintain core public health services, and substituting an unlicensed public health workforce. Additional studies are needed to examine the impact of the changing scope of practice of public health nurses, its subsequent impact on population health, and its impact on the numbers of public health nurses.

### **Limitations**

Three very distinct environments made the comparison of the work environment difficult. A limitation of this study is that the data analysis was at the individual level, not at the organizational level. A specific type of work environment, such as medical-surgical units, within a hospital compared across different hospital medical-surgical units was not the comparison in this study. The nurse work environment was important across the many different types work environments of PHN, SN, and HHN. For instance, one public health nurse might work as a consultant and consider her client the community and have filled out the survey based on the office setting. Another public health nurse might work in public health clinic offering immunization and reproductive health services. In these two examples, both nurses are public health nurses but have very different work environments. This study did not differentiate between the two types of environment. Similarly, some school nurses might work in an office setting in the school with limited clinical equipment, and others might work in a school-based health clinic. School nurses who do work in schools might work with a student population with severe chronic physical health conditions requiring feeding tubes or ventilators, or with students who have chronic, severe mental health issues, or students with other chronic conditions such as diabetes (Bergen, 2013). All types of school nurses were included in the same category. Some of the home health nurses might be administrators, managers, or case managers who do not work in the field and who do not work an on-call shift. This contrasts with other home health nurses who work in the field and work on call shifts.

Other limitations of this study were that there are no patient outcome measure and no organizational measures. Also, the study results might have been different because a smaller

percentage of PHN and SN completed the PES and the scale for high burnout. In addition, the groups were unequal in size. HHN were the largest group and PHN was the smallest group.

The survey was disseminated in four states (California, Florida, New Jersey, and Pennsylvania). Those four states organize and fund public health and subsequently public health nursing in different ways. It's unknown how the funding of public health agencies impacted the nurse outcomes for public health nursing. Additional research could organize the respondents by state, which would be marker for governance typology and funding (Meit, et al., 2012). There were other questions which could not be answered by this analysis of the dataset, and would require longitudinal data, or would require a mixed methods research approach such as: how has the role of the public health nurse changed over time?

### **Conclusion**

This study examined nurse outcomes, work environment, and the impact of work benefits on public health nurses, school nurses and home health nurses. For home health nurses, the adverse nurse outcomes identified were nurse burnout, and job dissatisfaction. The important job benefits to improve satisfaction for HHN were health, retirement, and tuition benefits. Home health nurses fill an important role in the health care system, as they work with families and individuals in various transitions from hospital to home. Home health agencies should consider strategies to improve the work schedule for HHN and strategies to purchase better health, retirement, and tuition benefits. In addition, although it was not a significant finding in this study, more than 50% of HHN did not have a bachelor's degree in nursing. Home health agencies could support better tuition reimbursement for their nursing staff and offer a pay differential for those who have a bachelor's degree. These might be some important strategies to recruit and retain nursing staff.

School nurses experienced the lowest probability for adverse nurse outcomes but were dissatisfied with their professional status. This would appear to be an issue of working in environment focused on education, not health care. The probability for dissatisfaction of tuition benefits was over 50% for SN. Since school nurses assure the health of the students in school,

school administrators and school boards should consider ways to reinforce the importance of the role of school nurses and consider ways to improve tuition benefits for the nurses.

In this study, public health nurses were the smallest group in the sample. A satisfactory work schedule, satisfactory employment benefits, access to a retirement plan and a pension plan, and a better work environment reduced the likelihood of burnout for PHN. Meanwhile, PHN has the highest probability for dissatisfaction with salary, dissatisfaction with opportunity for advancement, and intent to leave. Public health nurses play an important role in assuring an adequate public health response to emergencies and emerging infections. Studies identified the issue of dissatisfaction with salary and with opportunity for advancement as issues for public health nurses almost 25 years ago. Government agencies, in general, have not changed their salary structure or career ladder to remedy these areas of dissatisfaction. This might be due to the lack of funding for public health, and due to the constraints of government human resources. Even though additional studies are necessary to improve the retention of public health nurses and to improve the job satisfaction of PHN, governmental agencies should review their salary and hiring practices to improve recruitment and retention. This will assure the continuation of public health nursing.

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