Staying on the Team: Public Health Nurse Retention and Mentorship

By

Christine E. Wanous

May 2025

Chair of the Dissertation Committee: Dr. Rashmita Basu

Major Department: Public Health

ABSTRACT

Research Problem and Objectives

The well-being of the public health nurse workforce is in jeopardy due to national funding, demographic trends and workplace factors. Public health nurse attrition negatively affects public health agencies and the communities they serve. This study investigated what relationships five aspects of mentorship may have with the retention intentions of public health nurses.

Methods

Independent variables of mentor structure (formal vs. informal), mentor network type, racial concordance with mentors, supervisors as mentors and being a mentor were studied to determine any relationship they had with the outcome variable of public health nurse retention. The five quantitative research questions and other data were analyzed using Fisher's Exact Test and logistic regression modeling. A cross-sectional sample of 526 current and former public health nurses were surveyed in the summer of 2024 regarding their mentorship and supervisor experiences, and retention intentions or reasons for leaving. Limited qualitative data was coded

into themes and sub-themes.

Key Findings

In the study, 17.2% of current PHNs planned to leave their employer in the subsequent twelve months. The top reasons public health nurses for leaving voluntarily included burnout, leadership concerns and low pay. Public health nurses who had a mentor-like supervisor had higher retention intentions (88%) than public health nurses without a mentor-like supervisor (67%) (odds ratio = 3.1; adjusted p-value = 0.002). Millennial public health nurses had the highest leave intentions of any generation at 43% compared to GenX and Baby Boomer public health nurses at a rate of 16% (odds ratio = 3.85; unadjusted p-value = 0.0004). Formal mentorship showed some promise for public health nurse retention while being a mentor indicated a possible attrition risk.

Conclusion

Mentor-like supervision and formal mentorship programs may be good strategies for public health agencies to cultivate to improve public health nurse retention. An elevated leave intention rate of Millennial public health nurses suggests that public health agencies have work to do to satisfy this group of nurses. While mentoring programs can be beneficial for public health nurse mentees, being a mentor may have attrition risks that warrant strategic planning by public health leaders. Finally, retired and former public health nurses are underexplored workforce groups that may be open re-recruitment with the right position opportunities.

Staying on the Team: Public Health Nurse Retention and Mentorship

A Dissertation

Presented to the Faculty of the Department of Department of Public Health
East Carolina University

In Partial Fulfillment of the Requirements for the Degree
Doctor of Public Health

By

Christine Wanous

May 2025

Chair of the Dissertation Committee: Dr. Rashmita Basu, PhD, MS
Dissertation Committee Members:
Dr. Ruth Little, EdD, MPH
Dr. Paul Vos, PhD, PStat
Ms. Sherita Sutton, MPH, MSW, CHES

Dedication

My dissertation is dedicated to my parents, Dr. Thomas and Elizabeth Wanous. My parents have been my lifelong mentors. As my study found, when supervisors are also mentors, they have positive influences on those they supervise. Likewise, when parents are also mentors, they create an environment that supports their children's dreams. My parents daringly love God, each other, their family and the many, many people who cross their paths. Their unconditional love and support form the backdrop for my life and dissertation accomplishments.

Acknowledgements

To my East Carolina University academic advisor, Dr. Rashmita Basu and my ECU dissertation committee members, Dr. Ruth Little, Dr. Paul Vos, and Sherita Sutton, you have my sincere gratitude for sharing your guidance and expertise. I could not have completed this work without you. I also thank Dr. Susan Little, NC Chief Public Health Nursing Officer, for your example, support and encouragement to contribute to the understanding of PHN retention.

At Forsyth County Department of Public Health, I thank Joshua and the leadership team, fellow supervisors, public health colleagues, and survey pilot helpers for allowing me to put what I learned during my DrPH journey into practice. I express my heartfelt appreciation to my teammates, both current and former, especially Lisa, Sherita, Keisha, Hannah, Melissa, Oneicesa, Nicole, Jamila, Jill, Tania, Beverly, Tammy, Amber, Kelly, Marie and Glenda. I have learned about mentorship from the "ground up" as a mentee, a supervisor and an admirer of your peer mentorship for each other. Mentor Up Forsyth mentors, Maura, Daniel and Alexis, thank you for volunteering to put into practice what mentorship means for fellow public health supervisors as we develop a public health mentorship model together.

My family and friends supported me through this amazing journey. Heartfelt thanks to my parents, Rebecca, David & Bonnie, Michael & Martha, Mark & Michelle, Sarah & Greg, Bonnie & Brian, Ploy, Debbie, Laura & Steve, Jane, John & Sarah, Bill & Barb, Audrey & Mark, Lynn & Bill, Purity, Donna, Angela, Donna & Dave, Nancy & Kurt, Carolyn, Cecilia, Lily, Lucy and Silvia & Eddie.

I am grateful to all the public health nurses who shared your experiences so that others better understand your challenges and most of all your joys of working as a public health nurse.

I thank God for His ever-present help and guidance during the DrPH process.

TABLE OF CONTENTS

TITLE i

COPYRIGHT ii

DEDICATION iii

ACKNOWLEDGEMENTS iv

LIST OF TABLES xv

LIST OF FIGURES xvii

LIST OF ABBREVIATIONS xviii

CHAPTER 1: INTRODUCTION AND PROBLEM FORMULATION 1

The Public Health Nursing Workforce Needs Attention 1

The Importance of Public Health Nurses 1

Reduction of the Public Health Nursing Workforce 2

Public Health Nurse Retention and Mentorship 4

The Focus of this Study 4

Reasons for Public Health Nurse Attrition 5

The Impact of Public Health Nurse Attrition 6

Public Health Nurse Retention Strategies 7

This Study's Implications for Public Health Nurse Retention 8

Research Questions 10

Dissertation Objectives 10

Overview of the Dissertation Paper 11

Chapter 2: Literature Review and Theoretical Framework 11

Chapter 3: Methodology 11

Chapter 4: Results 12
Chapter 5: Discussion, Implications, Summary and Conclusions 12
References 13
Appendices 13
CHAPTER 2: REVIEW OF LITERATURE & THEORETICAL FRAMEWORK 14
Public Health Nurse Attrition 14
Reasons for Public Health Nurse Attrition 14
Strategies for Retention of Public Health Nurses Other Than Mentoring . 15
Mentorship as a Public Health Nurse Retention Strategy 16
Nurse Mentee Retention 16
Mentor Retention 17
Public Health Agencies Benefit from Mentorships 19
Key Research Studies Involving PHNs and Retention 20
Watts-Isley and Colleagues (2022) 20
Brook and Colleagues (2019) 20
Campbell and Colleagues (2020) 21
Mentorship Characteristics 21
Informal vs Formal Mentorship 21
Informal Mentorship 21
Formal Mentorship. 22
Differences Between Informal and Formal Mentorship 23
Training for Formal Mentorships 23
Internal vs. External Mentors 25

Mentor Functions 26
Career Function 26
Psychosocial Function 27
Role Modeling Function 27
Mentor Networks 28
Racial Concordance in Mentorship 29
Measuring the Strength of the Mentor Relationship 30
Organizational Efforts to Retain Public Health Nurses by Mentorship 30
Supportive Leadership 30
Formal Mentorship Programs 31
Organizational Culture that Encourages Informal Mentorship 32
State-led Efforts to Support Mentorship 33
Gaps in Current Research and this Study 34
Public Health Nurse Focus 34
Mentorship Attributes and Public Health Nurse Retention 34
Effectiveness of Formal vs. Informal Mentorship for PHN Retention 34
The Effects of Being a Mentor for Public Health Nurse Retention 35
The Effects of a Mentor-like Supervisor for PHN Retention 36
Mentor Racial Concordance and Public Health Nurse Retention 36
Reasons Why Public Health Nurses Might Return to Public Health 37
The Developmental Network Patterns of PHNs 37
Theoretical Framework 38
Social Network Theory 38

Developmental Network Model 38
Key Terms Used in this Study 40
Public Health Nurse 40
Mentorship 41
Mentor vs. Other Influential People 42
Mentor Role 42
Supervisor Role 42
Coach Role 43
Mentor vs. Non-mentor 43
Formal vs. Informal Mentorship Structure 44
Internal vs. External Mentors 45
Strong vs. Weak Mentorship Ties 46
Racial Concordance of Mentees and Mentors 47
Intent to Leave 47
CHAPTER 3: METHODOLOGY 50
Study Design 50
Measures 50
Formal vs. Informal 51
Experience Being a Mentor 51
Having a Mentor-like Supervisor 51
Racial Concordance with Mentor 51
Developmental Network Patterns 52
Strength of Ties for a Mentor Relationship 53

Calculating the Location of a Mentor Relationship 55
Defining the Strength of Ties and Location of the Mentor Network. 55
Data Collection 56
Survey Details 58
Pilot Study 58
Final Survey 58
Demographic 58
Mentorship Descriptions 58
Supervisor Characteristics 59
Additional Mentorship Experiences 59
Retention Details 60
For Former Public Health Nurses 60
Qualitative Questions 60
Generational Distinctions 60
Mentor Function Measurement 61
Data Analysis 62
Tools and Materials Used to Analyze Data 62
Visualization of Quantitative Data 62
Key Variables 62
MFQ-9 Scoring 64
Developmental Network Type 64
Visualization of Qualitative Data 64
Statistical Analysis 65

Quantitative Independent Variables and Outcome Variable 65
Modeling 65
Qualitative Data 66
Summary of Findings 66
Obstacles Encountered and Overcome 66
Reaching Public Health Nurses to Include in the Study 66
Finding Former Public Health Nurses 68
Effectiveness of the Study Approach 69
CHAPTER 4: RESULTS 70
Descriptive Characteristics of the Sample 70
Demographic Characteristics 70
Current PHNs 70
Former PHNs 71
Mentorship Experience 73
Current PHNs 73
Former PHNs 73
Supervisor Relationships 75
Current PHNs 75
Former PHNs 75
PHNs' Retention Plans or Decisions 76
Current PHNs 76
Former PHNs 78
Quantitative Results 81

Research Questions 81
Research Question #1: Retention and Mentor Type 83
Research Question #2: Retention and Mentorship Network Pattern . 87
Research Question #3: Retention and Being a Mentor 91
Research Question #4: Retention and Mentor-like Supervisor..... 95
Research Question #5: Retention and Racial Concordance of Mentor 99
Other Significant Quantitative Findings for Current PHNs..... 102
Generation and Retention 103
Generation and Mentor-like Supervisor..... 103
Having a Mentor-like Supervisor and a Mentor 104
Employee Sponsored Mentor Program and Formal Mentorship 105
Other Quantitative Findings for Current PHNs 106
Employer and Retention 106
State of Residence and Retention 107
Education Level and Retention..... 107
Position and Retention..... 107
Employer Sponsored Mentor Program and Retention..... 108
Generation and Mentor Type..... 108
Other Quantitative Mentorship Findings for Former PHNs 108
Experience of Being a Mentor..... 108
Experience with Mentors 109
Experience with Mentor-like Supervisors 111
Qualitative Results..... 111

Current PHNs 111
Planning to Leave 111
Planning to Stay 114
Planning to Retire 117
Former PHNs 118
Reasons Former PHNs Left 118
Former PHNs Requirements to Return 122
Reasons Former PHNs Will Not Return 125
CHAPTER 5: DISCUSSION, IMPLICATIONS, SUMMARY AND CONCLUSION 127
Discussion and Interpretation of Findings 127
Retention and Mentorship 127
Research Question #1 128
Research Question #2 129
Research Question #3 129
Research Question #4 131
Research Question #5 132
Retention of Millennial Public Health Nurses 132
Retention and Workplace Environment 133
Stress of the Job 133
Dissatisfaction with Pay 134
Internal Inequity of Pay 135
Lack of Advancement Opportunities 135
Retention and the Role of Public Health Leadership 135

Supportive Leaders and Supervisors 136
Poor Leadership and Lack of Support 137
Attrition and Public Health Nurse Burnout 138
Retention of PHNs Nearing Retirement and Re-Recruitment of Retired PHNs 138
Retiring PHNs are Interested in Staying on the Team (Part-Time) ... 139
Flexible Work Schedule Desired 139
Strengths of the Study 139
Mentorship Relationship Detail 140
Former PHNs Included 140
Anonymity 140
Limitations of the Study 140
Sample Size 140
Low Response Rate 141
Missing Data 141
One State 141
Three Generational Spread 141
Cross-Sectional 142
Summer Season Collection 142
Conclusion 142
Recommendations for Public Health Practice 142
Capacity Building for PHN Supervisors and Leaders 142
Mentor-like Supervisory Style 143
Leaders' Performance 143

Formal Mentorship Programs for Public Health Nurses..... 143
Agencies Benefit from Having a Formal Mentorship Program..... 144
Offer Formal Mentorship Widely..... 144
Choose Established and Supported PHNs as Mentors..... 145
Train All Supervisors to be Mentor-like..... 145
Focus on Millennial PHNs..... 146
Address Public Health Nurse Burnout..... 146
Restructured PHN Positions to Accommodate Retired and Parenting PHNs 147
Summary and Opportunities for Further Research..... 148
REFERENCES..... 149
Appendix A: UMC-IRB # 181
Appendix B: Permission to Use Developmental Networks Figure 1 184
Appendix C: Permission to Use MFQ-9 with Alterations 187
Appendix D: Current PHNs' MFQ-9 Answers for Primary Mentor and Retention P-Values 188
Appendix E: Diagram of Public Health Nurse Recruitment 189
Appendix F: CEPH Competencies Addressed 190

List of Tables

Table 1: Demographic Description of the "Staying on the Team" Study Sample 71

Table 2: Mentorship Experience by PHN Category 74

Table 3: Characteristics of Supervisor Relationships 75

Table 4: Retention Intentions of Current and Former PHNs 76

Table 5: Current PHNs Research Questions' Unadjusted Results 82

Table 6: Research Question 1: Retention and Mentor Type Results 83

Table 7: Formal vs. Informal Mentorship and Retention Rate 84

Table 8: Research Question 2: Retention and Mentor Network Type Results 88

Table 9: Mentor Network Type and Retention Rate 88

Table 10: Research Question 3: Retention and Being a Mentor Results 91

Table 11: Serving as a Mentor and Retention Rate 92

Table 12: Research Question 4: Retention and Having a Mentor-like Supervisor Results 96

Table 13: Mentor-like Supervisor and Retention Rate 96

Table 14: MFQ-9 Primary Mentor and Supervisor Answers 98

Table 15: Supervisor MFQ-9 and Retention P-value Results 99

Table 16: Research Question 5: Retention and BIPOC PHNs and Similar Mentors Results 101

Table 17: BIPOC PHNs with Similar Mentors and Retention Rate 102

Table 18: Generation and Retention Rate 104

Table 19: Mentor-like Supervisor and Generation 105

Table 20: Having a Mentor and a Mentor-like Supervisor 105

Table 21: Current PHN Mentor Type and Agency Sponsored Program 106

Table 22: Former PHN and Served as a Mentor 110

Table 23: Former PHN and Desired a Mentor 111

Table 24: Most Common Exemplars of Leaving PHNs 113

Table 25a: Most Common Stay Reason Exemplars of Staying PHNs 116

Table 25b: Most Common Barriers to Retention Exemplars of Staying PHNs 117

Table 26: Most Common Exemplars of Soon Retiring PHNs 118

Table 27a: Most Common Retirement and Leadership Exemplars of Former PHNs 120

Table 27b: Most Common Workplace Environment Exemplars of Former PHNs 122

Table 28: Most Common Return Requirement Exemplars of Former PHNs 124

Table 29: Most Common Not Returning Exemplars of Former PHNs 126

List of Figures

Figure 1: Developmental Network Typology 53

Figure 2: Mentor Function Questionnaire (MFQ-9) 59

Figure 3: Current PHN Top Voluntary Leaving Reasons 77

Figure 4: Current PHN Top Requirements Delay or Return After Retirement 78

Figure 5: Former PHN Top Attrition Reasons 79

Figure 6: Former PHN Top Requirements to Return to PH Nursing 80

Figure 7: Former PHN Top Reason for Not Returning to PH Nursing 81

Figure 8: Bar Chart of Retention and Mentor Type 84

Figure 9: Bar Chart of Retention and Mentor Network Type 89

Figure 10: Bar Chart of Retention and Being a Mentor 92

Figure 11: Bar Chart of Retention and Mentor-like Supervisor 97

Figure 12: Bar Chart of Retention and BIPOC PHNs and Similar Mentors 103

Figure 13: Bar Chart of Having a Mentor and a Mentor-like Supervisor 106

Figure 14: Bar Chart of Mentor Type and Sponsored Mentor Program 107

Figure 15: Bar Chart of Former PHNs' Reason for Leaving and Having Been a Mentor 110

Figure 16: Bar Chart of Former PHNs' Reason for Leaving and Desired a Mentor 111

List Of Abbreviations

BIPOC	Black, Indigenous and people of color
Boomer	Participant born 1946 to 1964
CNET_TYP	Current PHN network type
FQHC	Federally Qualified Health Center
GenX	Participant born 1965 to 1980
GenZ	Participant born in 1997 or after
HIPAA	Health Insurance Portability and Accountability Act
IRB	Institutional Review Board
LHD	Local health department
LOE	Length of employment
MFQ-9	Mentor Function Questionnaire
Mil	Participant born 1981 to 1996
PH WINS	Public Health Workforce Interests and Needs Survey on)
PHN	Public health nurse
ROC	Receiver Operator Curve
Silent	Participant born before 1946
SNT	Social Network Theory
RN	Registered Nurse

Chapter 1: Introduction and Problem Formulation

The Public Health Nursing Workforce Needs Attention

The Importance of the Public Health Nurse

Public health nurses are community leaders and frontline public health workers who promote and protect the health of their geographic residents. Whether there is a local outbreak of a communicable disease in an urban neighborhood, a gap in family planning services for young adults, a need for kindergarten physicals and immunizations for rural children, or a hurricane shelter housing elderly residents requiring assistance managing their medications, public health nurses are essential providers for their communities (MNDOH, 2019). Public health nurses meet community residents' health and wellness needs through the lifespan starting before birth with preconceptual counseling and prenatal home visiting programs all the way to elder-focused vaccination campaigns for influenza and pneumonia (Reiss-Brennan et al., 2022). All residents benefit from the services of public health nurses regardless of their socio-economic status. Public health nurses provide vision screening to school children from families of all income levels in public school systems (Nottingham Chaplin et al., 2020; Becker & Maughan, 2017). Public health nurse-led Covid-19 mass vaccination campaigns in 2021 were open to all community residents (Gwon et al., 2023). Without public health nurses, the national public health system capability would be hobbled and unable to meet the nation's public health needs (Gwon et al., 2020). Although public health nurses comprise the largest public health workforce sector trained to meet community needs, a multi-cause crisis of public health nurse staffing exists (Beck & Boulton, 2016; Gwon et al, 2020).

Reduction of the Public Health Nursing Workforce

The overwhelming catalyst driving the public health nursing workforce crisis is a reduction in national funding for public health positions in the US. As made apparent in the 2021 national Public Health Workforce and Needs Study (PH WINS), the public health workforce declined by 16% from 2008 to 2019 (Leider et al., 2023a). The Association of State and Territorial Health Officials (ASTHO) reported a drop of 10% in the public health workforce from 2012 to 2019 coinciding with a reduction in federal and state public health funding of 10% from 2010 to 2018 (ASTHO, 2022).

According to a 2012 national public health nurse survey by Beck & Boulton (2016), public health nurses comprise the largest job category of the public health workforce within local health departments, making up 63% of the positions. However, identifying the accurate status of the public health nursing workforce nationally is difficult because PHNs are employed by a variety of organizations besides local and state health departments including community-based nonprofits, Federally Qualified Health Centers (FQHCs), universities and hospitals (Kneipp et al., 2022). The total size of the public health nursing workforce is challenging to calculate since although the population-focused roles and functions of public health nurses are defined by the Council of Public Health Nursing Organizations, the American Nurses Association, the American Public Health Association Public Health Nursing Branch, and the Public Health Intervention Wheel, nurses who fulfill this mandate outside of health departments are often not included in research and surveys (Kneipp et al., 2022, ANA, 2022). Although PHN estimates from four studies indicate the national PHN workforce to be somewhat stable with 37,000 PHNs in 2000, 39,000 in 2010, 34,521 in 2012 and 41,000 in 2014, this may not reflect the current trend (Beck & Boulton, 2016). For example, in North Carolina, from 2011 to 2017, PHNs

positions declined by 9% (Watts Isley et al., 2022). And the Georgia Department of Public Health reported that there had been a 34% reduction in public health nurses in Georgia during the past decade (Pullen & Indiana Wesleyan University, 2022). Thus, there are indicators that the national public health nursing workforce size has declined over the past couple of decades.

A second factor affecting the public health nursing workforce is that public health nurses are retiring at an accelerated rate as baby boomer nurses reach retirement age. The aging of the nursing workforce is affecting public health agencies. The 2020 national Nurse Workforce Study found that the median age of RNs in the US had climbed to 52 compared to 51 in 2017 and that 19% of the RN workforce was 65 or older (National Council of States Board of Nursing, 2021). In Beck & Boulton's national public health workforce study, 26% of public health nurses were estimated to be eligible for retirement between 2012 to 2016 with an increasing percentage each year (Beck & Boulton, 2012). In the Watts-Isley et al. study (2022), 12.5 % of North Carolina's frontline PHNs planned to retire in the next three years and 28% were 55 years or older. Between 2024 and 2027, individuals in the US turning 65 years old will escalate at such a rate that by 2030, one-fifth of Americans will be 65 or older (Fitchner, 2024). The public health nursing workforce will continue to be affected by this retirement wave of baby boomer public health nurses. Younger nurses will need to be recruited and retained to replace them.

Thirdly, public health nurse attrition is a national concern. Public health nurses are leaving the field for retirement and non-retirement reasons. Roughly half of public health nurses' attrition is related to voluntary departure (Watts-Isley, 2022). In a public health nursing retention study by Charlie (2017), 13% of the PHNs intended to leave the field in the next 12 months. Watts-Isley et al., (2022) found that 33% of the PHNs in their study intended to leave within the next three years. Replacing exiting public health nurses comes at a cost to the local public health

agencies and public sector funders. Public health leaders are searching for better nurse retention strategies. Because public health agencies are primarily publicly funded, they are unable to keep pace with privately paid nursing job competitors. Therefore, public health leaders need to improve the work experience of public health nurses in other ways to retain and recruit staff.

Public Health Nurse Retention and Mentorship

The Focus of this Study

This study focused on how mentorship is associated with public health nurse retention. Mentorship is an effective nurse retention strategy, reducing the need to continually recruit new public health nurses. While it is known from other studies that mentorship experiences improve public health nurse retention, details of mentor relationships remain understudied (Watts-Isley, 2022). More research about the mentorship experience of public health nurses will help leaders understand how to use mentorship more effectively as a retention tool.

Adding to the current understanding of how mentorship can improve the work experiences of public health nurses and reduce nurse attrition was the objective of this study. Current and former public health nurses were included to better understand the relationship between mentorship and retention with public health nurses. With public health nurse retention as the outcome of interest, variables including mentorship type (formal vs informal), mentor's location, mentor relationship strength, racial concordance with the mentor, and having a mentor-like supervisor were examined for influence on intent to stay rates. Experiences of mentors for other colleagues was studied to see if this influenced retention rates. Demographic factors such as nurses' generation (GenZ, Millennial, GenX, Baby Boomer and Silent), work setting, and work schedule (part-time vs full-time) in retention rates were examined as well. Understanding the experience of workplace mentorship for public health nurses of different backgrounds can help

motivate public health leaders to tailor mentor experiences for better retention outcomes.

Reasons for Public Health Nurse Attrition

Compounding the challenges of the public health nurse retirement wave, nurse attrition for non-retirement reasons is plaguing the public health workforce. A report from the NC Department of Health and Human Services indicated that 23% of registered nurses in NC are not in the workforce (NCDHHS, 2024). Early nurse attrition can be defined as leaving the profession before age 55 (Walker & Clendon, 2018). However, nurses are at the highest risk for attrition early in their careers (Brook et al., 2019; Zhang et al., 2016). Public health nurses have expressed their intention to leave their employers in large numbers. Watts Isley et al., (2022) found that 35% of NC PHNs reported an intent to leave their positions voluntarily for non-retirement reasons within 3 years. Stewart et al., (2020) found that 26% of rural Canadian public health registered nurses intended to leave their employer within 12 months. In the national 2017 Public Health Workforce Interests and Needs Survey (PH WINS), 53% of local health department (LHD) staff signaled an intent to leave their agencies within 5 years (de Beaumont, 2023).

Subsets of PHNs are leaving their public health employers at differing rates. In the PH WINS survey, the largest categories of public health staff that left their public health agencies were young employees followed by employees with at least 21 years of experience (Leider et al., 2023a). Canadian public health nurses under 30 were the most likely to intend to leave their employers at 34% (Stewart et al., 2020). A study of public health nurses in 10 states found that a different subset of PHNs were also likely to leave their employers, namely mid-career nurses aged 35-45 as well as newer nurses who had less than 3 years' experience (Royer, 2009). In a large study of nurses in 2022, during the Covid-19 pandemic, nurses who were Black, Indigenous or other people of color (BIPOC) were more likely to indicate high levels of stress

and burnout at work and an increased intent to leave their employer (Smiley et al., 2024).

Public health nurses leave prematurely for various reasons including low salaries (Watts Isley et al., 2022; Pourshaban et al., 2015). Dissatisfaction with their work environments is another reason PHNs leave their public health positions (Pourshaban et al., 2015). Some public health nurses are unhappy with work relationships and lack of professional growth opportunities (Watts Isley et al., 2022; Pourshaban et al., 2015). Burnout was a common reason for leaving employment in a study review of Millennial nurse attrition (McClain et al., 2022). By early 2021, the stress of Covid-19 pandemic response contributed to over 52% of the public health workforce experiencing poor mental health symptoms including anxiety, post-traumatic stress disorder and thoughts of suicide (ASTHO, 2022). Covid-19 pandemic work stress impacted public health nurses negatively and accelerated attrition (Bryant-Genevier et al., 2021; Watts Isley et al., 2022). However, the Covid-19-fueled nurse attrition pattern may have been temporary as researchers found that the pre-Covid pandemic nurse workforce recovered by 2023 after a drop of 100,000 US nurses in 2021 (Auerbach et al., 2024).

The Impact of Public Health Nurse Attrition

Disconcertingly, high rates of public health nurse attrition can lead to a cascade of consequences for public health organizations including the inability to maintain adequate services to the public, intellectual knowledge drain, increased stress for existing staff covering the work of vacant positions in addition to their own, decreased morale of remaining staff, increased client attrition in public health programs, and increased expense incurred due to staff turnover, hiring, and training new employees (Davila & Pina-Ramirez, 2018; Pulver, 2021; Nei et al., 2015; Williams et al., 2023). In a qualitative study of hospital nurses, researchers identified that the exit of nurse colleagues led to increased workload and stress for remaining nurses,

threatened patient care quality and decreased staff morale (Berthelsen & Hansen, 2024). Communities whose public health nurse workforce was both experienced and had advanced education was positively associated with residents' good health outcomes and longevity according to a study by Gwon et al., (2020). Improving public health nurse retention strengthens the overall outlook for the agency, reduces energy expended on recruitment due to low nurse turnover and fosters gains in community well-being.

Public Health Nurse Retention Strategies

Public health nurses' attrition can indicate an unsatisfying experience for the nurses, culminating in exit from their agencies. A good relationship with their supervisor, job satisfaction, and having pride in their agency were reasons public health employees stayed with their employers in the 2017 PH WINS study (Leider et al., 2023a). As public health leaders seek retention solutions, researchers have confirmed several strategies promising to improve public health nurse retention. Successful nurse retention strategies in a variety of nursing settings that are evidence-informed include increasing compensation (Roth et al., 2022; Watts Isley et al., 2022, CNA, 2024), developing thorough and individualized onboarding plans (Tomietto et al., 2015; Friday, 2014; Foley et al., 2021; Larsen et al., 2018; Celano et al., 2021; Masimula, 2014), providing continuing education opportunities (Sibbald et al., 2020), improving working conditions, autonomy and job flexibility (Yeager & Wisniewski, 2017; Nei et al., 2015; Towns, 2011), enhancing leadership skills of management (Beam et al., 2010; Campbell et al., 2020; Weberg, 2010; Mayende & Musenze, 2018), communicating that nurses are valued and recognized (O'Donoghue, 2023), building team connectedness (Yeager & Wisniewski, 2017; Campbell et al., 2020; Towns, 2011; Roth et al., 2022) and facilitating mentorship opportunities in the workplace (Watts Isley et al., 2022; Cottingham et al., 2011; Schroyer et al., 2020; Wilson,

2023; Lewis et al., 2019; Djiovanis, 2023; Ward-Smith et al., 2023; Kakyo et al., 2022; Zhang et al., 2016). Retired nurses (and those soon to be retired) may be amenable to returning to the agency (or delaying full retirement) under the right conditions (Foster, 2019; Sheppard et al., 2022). Public health agency efforts in these areas can potentially improve public health nurse retention.

Mentorship has been shown to improve nurse retention for the mentee in a variety of employment settings including public health (Watts Isley et al., 2022), hospital acute care (Cottingham et al., 2011; Schroyer et al., 2020; Wilson, 2023; Lewis et al., 2019; Djiovanis, 2023; Ward-Smith et al., 2023; Kakyo et al., 2022; Zhang et al., 2019; Zhang et al., 2016), and long-term care (Cottingham et al., 2011). Jung & Kim (2024) found that Millennial nurses value mentors and mentorship can support Millennial nurses' desire for work-life balance and help reduce nurse burnout. Wong et al. (2021) confirmed that young public health professionals seek mentorship opportunities. If public health nurses are like other government employees, public health nurse mentors may contribute to increasing their longevity with their employer by mentoring others (Lentz & Allen, 2009). Encouraging older workers to become mentors prevents intellectual knowledge loss that occurs when older workers retire without sharing their career-long perspectives and information with younger workers (Messe & Greenan, 2023). This study focuses on understanding more about what factors of mentorship influence public health nurse retention.

This Study's Implications for Public Health Nurse Retention

The findings of this study inform public health leaders about how mentorship contributes to public health nurse retention. Several implications for public health programming emerged from this study.

First, PHNs who participated in formal mentorship had a higher rate of retention than those who had informal mentors. Local health departments and other public health agencies could use the information to develop formal mentorship programs within their agency to promote retention.

Second, mentor-like qualities and behaviors in supervisors were associated with public health nurse retention. Public health agencies may want to invest in training supervisors in mentorship skills to improve relationships with the nurses on their teams to increase public health nurse retention.

Third, public health nurse mentors had higher rates of attrition than non-mentors. Accordingly, public health agencies may want to carefully choose, train and support public health mentors to prevent mentors' attrition.

Fourth, discovering why current PHNs intended to leave their public health employers can inform public health leaders what steps to take to reduce the exit of their public health nursing staff.

Lastly, understanding why former public health nurses left the field and what would draw them back into public health nursing may inform public health leaders how to reduce public health nursing attrition and how to attract former PHNs back on their teams.

The findings of this study are of practical use to local health department leaders and consultants who support them. Mentorship begets more mentorship. Bozionelos (2004) found that mentees who receive generous and supportive mentoring are more likely to subsequently offer the same to new mentees, thus developing a culture of mentorship within an organization. Since participants and organizations benefit from mentorship, strategically encouraging and incentivizing both participation as mentors and mentees may promote a culture of growth and

staffing stability (Bozionelos, 2004). Increasing understanding about which mentorship components may be associated with public health nurse retention will inform public health leaders who seek to design effective mentorship programs or encourage cultures of mentorship at their agencies.

Research Questions

The following research questions were the focus of this study. The answers were determined by analyzing survey data from public health nurses.

1. Is the retention rate different for public health nurses who have formal compared to informal mentor(s)?
2. Is the retention rate different for public health nurses with a traditional mentorship network pattern (strong internal agency mentor relationships) compared to those with other types of mentorship network patterns?
3. Is the retention rate different for public health nurses who have been mentors compared to those who have not?
4. Is the retention rate different for public health nurses who have a mentor-like supervisor compared to those who do not?
5. Is the retention rate different for non-white or Hispanic (BIPOC) public health nurses who have racial or ethnic concordant mentors compared to those who do not?

Dissertation Objectives

Local health departments are seeking effective solutions to improve nurse retention. The primary objective of this study was to shed light on what aspects of mentor relationships are associated with higher rates of public health nurses' intent to stay with their agencies. The findings of this study are of practical use to local public health leaders who want to improve

public health nurse retention.

A secondary objective of this study was to understand reasons why former public health nurses left the field of public health before retirement and what might attract them back into the field. Hiring an experienced public health nurse to fill a vacancy at a local health department could save onboarding time and resources and increase the depth of public health knowledge at the agency. Insights gained from asking former public health nurses about their attrition experiences could inform public health leaders how to target this untapped group for re-recruitment.

Overview of the Dissertation Paper

The following is an outline of the rest of the dissertation paper.

Chapter 2: Literature Review and Theoretical Framework

Chapter 2 reviews the research that has contributed to understanding public health nurses' attrition, retention, mentorship, and how they relate to each other. The theoretical background of Social Network Theory is explored to better understand mentor network relationships. The developmental network model of Higgins & Kram (2001) is described and applied as a framework to explore public health nurse retention. Gaps in the literature relating to public health nurse attrition, retention, and use of mentorship as a retention strategy are discussed. Key terms used in the study are defined.

Chapter 3: Methodology

Chapter 3 discusses the type and design of the study. Data collection decisions and methods are explained. Survey details are discussed including distinctive aspects of the survey. Data collection methods are explained including the use of Qualtrics as the survey instrument. Plans for data visualization and statistical analysis are described including the use of R (2023) to

test the effects of independent variables on the outcome variable of intent to stay using logistic regression. Plans for the display of quantitative and qualitative findings including charts and models are detailed. The chapter concludes with an explanation of obstacles encountered and how they were overcome.

Chapter 4: Results

In chapter 4, the results of the study are presented in line with each research question. Quantitative results are presented narratively, in charts, models and figures. Observations of any patterns are shared. Qualitative data that resulted from open-ended questions are grouped by themes and sub-themes and discussed.

Chapter 5: Discussion, Implications, Summary and Conclusions

Chapter 5 highlights the interpretation of what the data revealed regarding public health nurse retention and mentorship. Expected and unexpected findings are presented. Alternate explanations for findings are explored. Implications of the findings are discussed including how they compare to previous research studies. How the findings matched or not with the developmental network model of Higgins & Kram (2001) are discussed. Implications for public health leaders and public health organizational planning are explored. The significance of the findings for the field of public health nursing are presented. Limitations of the study are discussed including what conclusions cannot be drawn from the findings and what can and cannot be generalized from the results. Additional variables that would have been interesting or valuable to include are identified.

Chapter 5 concludes the research paper with a summary of research questions, findings, and recommendations. The effectiveness of the research study design in answering the research questions is explored. Surprises that surfaced and further research ideas raised during the study

are proposed. Recommendations for public health practice and local health department retention strategies are offered. New questions for further research are suggested. Finally, the contributions that this study makes to public health nurse retention are highlighted and summarized.

References

All references and supporting studies referred to in the paper are included in this section.

Appendices

Appendices are included in this section including the IRB approval letter and permission to use other researchers' tools and models.

Chapter 2: Literature Review and Theoretical Framework

Public Health Nurse Attrition

Reasons for Public Health Nurse Attrition

Multiple studies have investigated reasons for nurses' attrition from clinical settings other than public health. In these studies, researchers found that nurses leave their positions due to poor compensation (Roth et al., 2022), unfriendly work environments and relationships (Roth et al., 2022), work stress, exhaustion, compassion fatigue (Nei et al., 2015; MacKusick & Minnick, 2010; O'Hara et al., 2019) and the Covid-19 pandemic impact (Bryant-Genevier et al., 2021).

When specifically studying attrition for public health nurses, the list of reasons for leaving their employers is like that of nurses in clinical fields. Public health nurses are choosing to leave their employers for reasons of compensation, unsatisfying work relationships, lack of job flexibility, lack of advancement opportunities, stress and exhaustion and the multi-faceted effects of the Covid-19 pandemic (Watts-Isley et al., 2022; Leider et al, 2023b; Pourshaban et al., 2015). Leider and colleagues in two articles analyzed the PH WINS survey results from 2017 and 2021. They found that public health workers, including public health nurses, continue to have high rates of turnover and turnover intention, especially those who are younger than 50 years old, have graduate degrees, and those who participated in the Covid-19 pandemic response activities (Leider et al., 2023b; Leider et al., 2023a). Analyzing the PH WINS studies for trends provides a wealth of information regarding the US public health workforce and retention factors. However, one weakness in the PH WINS data is that public health nurse-specific data is not available for all variables.

Campbell et al., (2020) identified that Canadian public health nurses working in a nurse home visiting program left their positions for reasons including lack of supervisory support, emotional demands of the job, and feelings of isolation if working in rural offices as the only public health nurse.

Strategies for Retention of Public Health Nurses Other Than Mentoring

Increasing compensation for public health nurses can positively affect retention as salary is one of the main dissatisfiers. Dissatisfaction with pay was the most frequent reason public health employees under 35 intended to leave their employer in one study (Leider et al., 2023a). One study estimated that if all public health staff were equitably compensated and satisfied with their jobs, attrition would decrease by half (Pourshaban et al., 2015).

Strategies that improve public health nurses' supportive work relationships and emotional resiliency have been shown to improve nurse retention. Reflective supervision and supportive colleague relationships were identified as effective retention strategies for public health nurses who work with the Nurse-Family Partnership nurse home visiting program (Campbell et al., 2020). A variety of resiliency training strategies for future nurses that promote nurse retention and are applicable for public health nurses include the use of reflective practice, storytelling, mindfulness, peer mentoring and selfcare promotion (Low et al., 2019).

Researchers who studied hospital nurses' experiences who left their jobs proposed that nurse residency with mentorship can be effective for retention and reducing costs (MacKusick & Minnick, 2010). Jones et al., (2017) reported on a nurse residency program at Swedish Medical Center in Seattle Washington that began as a proactive approach to mitigate the effects of predicted future retirements of older nurses. Nurses in the residency program averaged a yearly turnover of 2% compared to 6.4% prior to the program initiation. A nurse internship for

emergency room nurses was credited for reducing the attrition rate from 82% to 11% in one study (Hignight et al., 2024). Nurse residency programs for public health nurses have been successful in Iowa, Wisconsin, and Georgia to equip and retain new public health nurses (Pullen & Indiana Wesleyan University, 2022).

Mentorship as a Public Health Nurse Retention Strategy

Nurse Mentee Retention. Employee retention is one of the many benefits of strong, satisfying mentorship (Ragins et al., 2000). In a review of studies examining interventions to reduce nurse attrition, Brook et al., (2019) found that mentorship as a stand-alone strategy improved nurse retention by an average of 17%. A review of formal mentoring programs in acute care nursing settings found that mentoring reduced new nurse turnover in the first year by 13-62% (Djiovanis, 2023). Nurse mentorship is a promising strategy to provide a supportive and positive work environment for nurses under 35 years old who are leaving the profession in high numbers. Since many of the younger nurses leave the field within their first three years, extending mentoring through the third year of employment is a way to moderate that trend (Ulep, 2018). One study conducted in Japanese hospitals found that when nurse mentors held group cognitive behavioral therapy sessions with nurse mentees, markers of nurse burnout and attrition intentions were reduced (Ohue & Menta, 2024)

In a qualitative study of hospital nurses, mentoring was found to contribute to job satisfaction, professional growth, and nurse retention (Kramer et al., 2021). Satisfaction with one's mentoring experience was found to be the strongest predictor of retention in a study of university professors (Xu & Payne, 2014). In a multi-site mentoring initiative, Partners in Nursing's mentor project provided a mentor program in several sites including hospitals and long-term care facilities resulting in 100% new nurse retention (Cottingham et al., 2011). Nurse

retention as a positive outcome was confirmed in a review of twenty-two nurse mentoring studies in hospital settings (Kakyo et al., 2022). In a school nurse mentoring program, participants reported program satisfaction and increased confidence in the areas of school health and public health (Hoke et al., 2024). One of the few studies that specifically measured retention for public health nurses and mentoring found that mentees were less likely to intend to leave within the next three years than those without a mentor (Watts-Isley et al., 2022).

Mentor Retention. Although there is more research on the benefits of mentoring for the mentees, there is evidence that mentoring is beneficial for mentors as well. Mentors gain personal satisfaction from mentoring and enjoy seeing their mentees succeed in their careers (LaFleur & White, 2010; Kakyo et al., 2022). In a qualitative study of nurse mentors, mentors expressed that mentoring supported their professional development (Hermansson et al., 2024). Mentors learn during mentoring, both from their mentees and by diligently studying research and best practices (Kakyo et al., 2022). Mentors may also benefit by furthering their career and experiencing salary increases (LaFleur & White, 2010). In a study of healthcare workers, Allen et al. (2006b) found that mentors experience more perceived career success, promotions, and received higher salaries than non-mentors. Mentorship can be one way to support young nurses' desire to explore fulfilling avenues within their organization or through agency-sponsored community service (Ulep, 2018). Ragins & Scandura (1999) identified that benefits for mentors included personal satisfaction, recognition, more support at work and the opportunity to support younger workers. Jones (2016) found that mentors benefited from mentoring others by gaining confidence.

Lentz & Allen (2009) discovered that being a mentor was associated with organizational retention of government employees. In their study, mentors had higher job satisfaction and

organizational commitment than non-mentors and the intention to leave the organization was lower for mentors than for non-mentors. For employees who had not received a promotion recently, involvement as a mentor mediated intent to leave the organization. Mentors who reported providing higher levels of psychosocial support reported more job satisfaction and less intention to leave than mentors who reported offering less psychosocial support (Lentz & Allen, 2009). For employees who had mastered their role but had not advanced in the organizational hierarchy quickly, mentorship provided a refreshing opportunity to continue growing even while in the same position at work. Providing mentoring to associates supported organizational commitment to retention for these employees who were experiencing an otherwise less challenging period in their careers (Lentz & Allen, 2009). Mentors who receive targeted mentor training and support may be more inclined to stay with their employer than informal mentors. Newman (2017) found that mentors involved in a nurse residency program had higher rates of intent to stay with their employers than mentors who were not in the structured residency program. Nurses who served as mentors had improved retention results compared to non-mentors in a large healthcare mentorship study (Rowen et al., 2024).

However, it is possible that nurse mentoring may not always be a retention factor for mentors due to stress and increased responsibilities. Nurse mentors in Sweden and Norway shared that mentoring can be frustrating when the mentor role is unclear, there is a lack of mentor training, understaffing prevents quality time with mentees and mentors feel isolated. Researchers caution that mentor role ambiguity and frustration could contribute to mentor attrition (Hermansson et al., 2024). In a qualitative study, nurse mentors in Ireland indicated that being a mentor added stress to their lives (Smith & Cantillon, 2024). Researchers found that how the nurse mentors defined their role affected the level of stress mentors perceived. Nurse mentors

who strove for perfection and felt pressure to teach mentees everything they needed to learn felt more stress than mentors who supported mentees by listening and helping new nurses apply what was already known to a new setting (Smith & Cantillon, 2024). In another study of nurse leaders, nurse mentors expressed that co-mentor support and planning mentor events ahead of time reduced the stress of being a mentor (Lysfjord & Skarstein, 2024). Morton (2013) discovered that home visiting nurse mentors desired increased support, training and control over their role as mentors. In a study to improve nurse mentor training, researchers developed an interactive mentor training board game that provided mentors with effective preparation for their new role and provided opportunities for co-mentor interaction and reflection (Almeida et al., 2024).

Public Health Agencies Benefit from Mentorships

In addition to mentors and mentees benefiting from mentorships, organizations also gain from mentorships. In one study of critical care nurses, collaborative relationships were born from mentorships which increased intergenerational understanding and improved cooperation within the nursing teams (Schroyer et al., 2020). Multiple studies have reported that mentoring saves organizations money by reducing attrition of mentees and thus decreasing hiring and training costs (Finley et al., 2007; Cottingham et al., 2011; Halfer et al., 2008; LaFleur & White, 2010; Kakyo et al., 2022). The savings enjoyed by retaining nurses can finance nurse mentor programs (Gil Bonanca, 2024). However, in their review of hospital-based new graduate nurse mentoring programs, Vidal & Olley (2021) found that the retention benefit of mentoring waned after year one and may disappear after year three. The researchers recommended that more studies be conducted to discover the best way to extend the retention benefit of mentoring and how mentoring programs can be applied to the non-acute nursing settings like public health (Vidal & Olley, 2021).

Key Research Studies Involving Public Health Nurses and Retention

Many of the research studies regarding how mentoring supports nurse retention involved participants in hospital settings. However, several key studies include public health nurses and how mentoring contributes to their retention.

Watts-Isley and Colleagues (2022). Public health nurse retention of frontline nurses working in local health departments in NC was the focus of the study by Watts-Isley et al., (2022). Just over half of the public health nurses in their study perceived that their health department had a problem with nurse retention and one third shared the intent to leave their employer in the next three years. In their cross-sectional study, about 54% had received mentoring at work and these frontline public health nurses were less likely to have plans to leave their public health department. The participant target group was a strength of this study. The researchers only included frontline public health nurses who worked at local health departments. This focus provided applicable retention data for public health nurses who are not often included or highlighted in nurse research. However, because mentorship was only one of several retention variables studied, there were few details provided regarding the type of mentoring experience the participants had (Watts-Isley et al, 2022).

Brook and Colleagues (2019). In a review of 53 studies regarding strategies to reduce early nurse attrition in various workplaces, Brook et al., (2019) found that mentorship helped to retain nurses. Of the studies that used mentorship as a retention strategy, two reported an improvement in retention averaging 17% and nine reported an average turnover reduction of 20%. Preceptor plus mentor models showed an average turnover reduction of 20% and a 15% reduction in nurse attrition. Two of the strengths of this study were the volume of studies reviewed (11,000 papers) and the rigorous review for data quality before inclusion in the final

summary of studies. A weakness of the study was lack of detail in the type of mentorship provided and that all the studies reviewed did not specify where the nurses worked so it is difficult to attribute the findings specifically to the public health nursing workforce (Brook et al., 2019).

Campbell and Colleagues (2020). In a qualitative study by Campbell et al., (2020) on recruitment and retention of public health nurses working in a home visiting program for first-time mothers and babies, team and supervisor support was identified as a key retention strategy. While relationships were not specifically defined as mentorship, peer support and regular reflective supervision provided public health nurses with the functions of mentorship, i.e. psychosocial support, career support and role-modeling, that contributed to nurse retention. Strengths of this study included a focus on public health nurse retention and qualitative data to inform the reader of in-depth examples of retention-specific ideas of the nurses. Limitations of the study included whether the findings can be applied to public health nurses who work in other types of public health roles (Campbell et al., 2020).

Mentorship Characteristics

Informal vs Formal Mentorship

Informal Mentorship. Understanding mentorship from a scientific perspective began with Levinson (1978) in his foundational book about adult development followed by contributions from other social science researchers in the 1980's and 1990's (Levinson, 1978; Kram, 1985; Higgins & Kram, 2001). In the early days of mentor research, it was generally accepted that informal mentor relationships were of higher quality and of more benefit to mentees than formally established ones (Scandura & Pellegrini, 2010). Ragins & Cotton (1999) discovered that informal mentorships provided a higher quality experience for mentees than

formal programs. Similarly, Chao et al., (1992) found that formal mentorship program participants received less mentor support than mentees with informal mentors. Ragins & Cotton (1999) found that proteges in formal mentorships experienced fewer mentor functions and achieved lower compensation than those who had informal mentors.

In recent years, many large corporation employers have designed formal mentoring programs to capitalize on mentoring for professional development of their employees. However, much of the mentoring research has not historically distinguished between informal and formal mentorship in their studies. This lack of clarity for mentoring outcomes makes it more difficult to create effective formal mentorship designs (Wanberg et al., 2003).

Formal Mentorship. Formal mentorship programs can be defined by how the matching between participants is achieved, what training for mentors is provided, if the relationships are in dyads or groups and if the relationship has a specific time limit (Allen et al., 2006a; Wanberg et al., 2003). Formal mentoring program effectiveness includes tuning in to participants' satisfaction with the program as longer-term results such as employee retention and career benefits will not be realized if participants do not find enough value to complete the program (Allen et al., 2006a).

Organizations design formal mentorship programs to capitalize on the benefits of mentoring which include enhancing professional development of employees, improving skills, and retaining workers (Eddy et al., 2001). Better participant engagement has been achieved in formal programs by giving mentors and mentees more decision-making control regarding their participation, selection of partners and structure of the relationship. In their study of mentor relationships with participants of four formal workplace programs, Allen et al., (2006a) found that voluntariness of participation was instrumental in increasing perceived program

effectiveness. Participant input into the matching process could be accomplished by arranging for informal gatherings of potential participants or sharing biographical summaries to choose mentor partners (Allen et al., 2006a).

Differences Between Informal and Formal Mentorship. In addition to how the relationship is initiated, researchers have identified that formal mentor relationships can differ from informal ones in several ways including commitment of the parties, training or preparation, expectation of participants, and length of the relationship (Allen et al., 2006a). Mentor commitment is assumed to be high for informal mentorships since the parties initiate the relationship themselves (Allen & Eby, 2003). In formal arrangements, however, mentor commitment may be variable due to mentors feeling forced or pressured to participate (Ragins & Cotton, 1999; Allen et al., 2006a). Providing more opportunities for participant input during the training and matching processes could increase mentor and mentee commitment (Allen et al., 2006a; Wanberg et al., 2003).

Instead of relinquishing complete control of matching to mentors and mentees, formal program matching shows optimistic results when mentors and mentees are more similar than different from each other (Allen & Eby, 2003; Turban et al., 2002; Allen et al., 2006a). However, to break down sectional silos and encourage cross-professional learning, matching mentors, and mentees from different departments in the workplace can have its benefits (Eddy et al., 2001). Allen et al., (2006a) note that the mentees' goals may be a deciding factor in what type of mentor is best suited to their needs depending on if they are seeking friendship and psychosocial support or want to better understand the operations of the organization.

Training for Formal Mentorships. Providing comprehensive training to both mentors and mentees in formal workplace mentor programs can improve understanding and buy-in for

role expectations and goals of the program (Allen et al., 2006a). In the absence of clear training and role definition, frustrations and stalled accomplishments can result (Eby & Lockwood, 2005). Allen et al., (2006a) found that receipt of training and perceived quality of the training contributed to mentors' perceived effectiveness of the program. Allen et al., (2006a) further discovered that focusing on the psychosocial function of mentoring for new mentors produced higher quality mentoring than focusing on the career function.

To offer effective formal mentorship programs to public health nurses, the same principles from the mentioned studies would be important to consider, namely clear role definition and comprehensive training for the mentors. Nurse mentoring researchers, Smith & Cantillon (2024), recognized that role definition is important for nurse mentor training. Encouraging the mentor to act as a facilitator of learning and support rather than as a perfect role model and trainer may reduce nurse mentor stress. Additional nurse mentoring studies revealed that using creative methods for nurse mentor training and mentee interaction such as board games or storytelling with reflection can increase nurse mentor interest and learning (Almeida et al., 2024; Durrant et al., 2024; Frechette et al., 2021).

Mentors' advanced knowledge and expertise facilitates a good learning environment for mentees (Ramaswami & Dreher, 2010). Research by Lankau & Scandura (2002) with hospital employees, including nurses, found that personal learning acquisition and role modeling during the mentor relationship contributed to higher intent to stay and subsequent mentee retention in the organization. Mentor training needs to include encouragement and strategies to promote the personal learning of mentees and opportunities for learning by watching the mentors in action.

With formal mentorship programs, both mentors and mentees need to be recruited. Mentees can be attracted to mentorship opportunities by discussing how mentorship at work has

benefits beyond retention including improved job satisfaction, career achievements, higher salaries, and promotions (Allen et al., 2004). Mentor involvement can be made financially attractive by incentivizing mentor participation as a career ladder component (Ward-Smith et al., 2023). Research-informed mentorship program kits, such as the one developed by the National League for Nurses, can assist public health organizations set up effective formal mentor programs (Baskin et al., 2020).

Internal vs. External Mentors

Employees may find support from mentors who are internal or external to their workplace. The impact external versus internal mentors have on mentees' outcomes has been explored by several researchers with differing results. Eby (1997) identified that career development may be augmented by having mentors outside the employee's workplace such as within a professional organization. However, the review of studies by Jones et al. (2016) found that internal coaches had more of a positive impact on employees' performance and skills than external ones. Higgins and Kram (2001) recognized that mentors both within and without the employees' workplaces should be accounted for to define the scope of employees' developmental networks.

When it comes to employee retention, having external mentors may lead to employees deciding to change employers. The developmental network model of Higgins & Kram (2001) proposed that having strong external mentors would lead to higher attrition. Internal mentors (or mentees) may begin a mentorship within the same organization and then transition to an external type as employees move to a new employer. When mentors and mentees remain in touch despite employer changes, the remaining party's access to new job opportunities can expand and lead to the other person of the pair also leaving the first organization (Ramaswami & Dreher, 2010). In a

longitudinal study of business school graduates, researchers found that those that maintained strong graduate school faculty and peer relationships from their past environment experienced lower job satisfaction in their current careers (Higgins et al., 2008). In their review of research studies on mentoring, Wanberg et al., (2003) noted that accounting for mentors' location was an area that needed more exploration.

Mentor Functions

To better understand mentoring, relationship aspects need to be defined. Mentor researchers use the term "functions" to define what ways the mentor impacts the life of the mentee. The two functions of career and psychosocial support have been used by Kram (1985) since her foundational workplace mentoring study. The career functions are defined as ways the mentor promotes the advancement of the mentee's career such as coaching, offering challenging assignments, exposing them to new professional settings and introducing them to influential people. The psychosocial functions include listening to the mentee process challenges, providing counseling, camaraderie, and role modeling. The psychosocial functions support the mentee's professional identity, confidence, and growth (Wanberg et al., 2003; Kram 1985).

Over the past decades, there have been differing opinions and strategies regarding assessing the function of role modeling. Some researchers have pulled role modeling out of the psychosocial construct and set it up as a third function (Wanberg et al., 2003; Scandura & Ragins, 1993; de Janasz & Godshalk, 2013, Scandura, 1992, Scandura & Viator, 1994, Weinberg & Lankau, 2011). Others have continued to view and study mentorship with the two original functions (Eby et al., 2013; Allen et al., 2004; Chao, 1997).

Career Function. Providing career growth support is a key function of mentoring. Mentors are often of higher rank or have longer tenure in an organization than their mentees and

can provide valuable perspectives regarding options and paths for career growth. Career functions that mentors provide mentees aim to advance employees in their careers with coaching guidance, providing opportunities to meet key leaders, providing protection from critics, explaining formal and informal organizational life, and offering new and challenging experiences (Kram, 1985; Lentz & Allen, 2010; Noe et al., 2002).

Psychosocial Function. The psychosocial function is central to mentor relationships and the benefits to mentees. Mentors provide emotional support and help mentees develop a strong sense of competence and professional identity through friendship, counseling, acceptance and listening (Kram, 1985; Lentz & Allen, 2010). Mentors help mentees navigate the integration of personal values and the challenges of organizational demands on their personal lives (Ramaswami & Dreher, 2010; Schultz, 1995). Higgins (2000) found that having one strong mentor relationship with high psychosocial support was more effective for job satisfaction for lawyers than having numerous mentors or other types of support offered. Mentorship may improve feelings of competence and confidence and can reduce voluntary early attrition of mentees (Kark et al., 2022). One study of nurse mentorship in Japan found that specialized mentor training in cognitive behavioral therapy techniques followed by group mentoring sessions with two mentors and several mentees reduced indications of burnout and attrition intention of the nurse mentees (Ohue & Menta, 2024). Freiheit (2017) found in a qualitative study of public health professionals that the onboarding period at public health agencies can feel overwhelming and employees may not receive enough initial support to gain baseline competence. Mentorship is well suited to providing extra psychosocial support to new public health nurses.

Role Modeling Function. Although Kram (1985) and early mentoring research placed role modeling inside the psychosocial function, other researchers including Scandura and Ragins

(1993) proposed it as a third function of mentoring. Having a mentor closer in rank to the mentee was found to be more helpful for role model learning (Allen et al., 2006a). Castro & Scandura's tool to measure mentor functions defines role modeling as one of three functional areas to assess in mentor relationships (Pellegrini & Scandura, 2005). Nurse mentor findings from Smith & Cantillon (2024) indicated that mentors may have reduced stress if they do not treat role modeling as a responsibility to teach their mentee how to do tasks perfectly, but rather an opportunity to support the mentees' learning through facilitation.

Mentor Networks

Conceptualizing mentor relationships as multiple developmental relationships rather than as relationships between two people has been studied by researchers over the past two decades. Higgins & Kram (2001) encouraged researchers to move beyond the one-on-one focus of mentorship and consider that mentorship is best understood as a network of developmental relationships. Dobrow et al., (2012) reviewed developmental network studies and confirmed that mentorships are best viewed as a multi-faceted network of internal or external relationships that promote the mentee's career growth. Halvorson et al., (2015) agreed that mentor networks, not individual mentor dyads, need to be studied when discovering the effect of mentorships for health science researchers.

Investigating developmental networks of mentees involve asking about any recent mentor relationships that may be within or outside the employee's workplace (Higgins & Kram, 2001; Noe et al., 2002). Eby (1997) identified that career building networks may include relationships outside the employee's organization. Wanberg et al., (2003) found evidence that having multiple mentors instead of a single mentor was associated with positive outcomes. In one study of lawyers, the intent to stay was more likely for employees with a developed mentor network

compared to a single mentor (Higgins & Thomas, 2001). In a study of the benefits of mentoring for nursing faculty, Ephraim (2021) discussed how group mentoring or mentoring networks can better support new nursing faculty and relieve pressure of trying to receive all mentoring needs from one person.

Racial Concordance in Mentorship

How similar or different mentors are compared to their mentees can be measured in various ways including gender, race, personal characteristics, and goals. Since the public health nurse workforce is mainly composed of white females, there is interest to increase diversity that reflects the communities served. The U.S. maternal child public health workforce needs a more diverse workforce according to Health Resources and Administration (HRSA) and can do so by preparing mentors who are culturally sensitive and racially diverse. In their Maternal Child Health Pipeline program for mentors, HRSA developers emphasize that mentors need to be prepared to address diversity needs of racism, imposter syndrome, institutional barriers, and discrimination of all types (Belcher et al., 2022).

Some researchers found that racial concordance did not influence the mentor relationship. Turban et al., (2002) suspected that racial and gender concordance may be less important to mentoring success than perceived similarities in other areas such as personal values as participants become acquainted. Eby et al., (2013) found that mentor-mentee similarities in values, personality and attitudes were more important in mentorship success than race or gender.

Given the choice, some mentees may prefer and find more support with racially concordant mentors. But even if racial concordance is beneficial, finding a mentor of the same race or ethnicity may not be easy if the mentee is a person of color. In a recent qualitative study of internal medicine residents of underrepresented racial groups, participants voiced that they felt

isolated and had few mentor choices who looked like them or had the same life experience (Harris et al., 2021). In their review of mentoring studies, Wanberg et al., (2003) identified that one area in need of more research in mentoring is how similarities and differences between mentors and mentees, including race, affect outcomes.

Measuring the Strength of the Mentor Relationship

Kram (1985) was perceptive to note that mentor relationships are of value and provide co-learning opportunities for both parties and can be considered strong and intense or weaker and less intense depending on the interpersonal connection (Kram, 1985; Dougherty et al., 2010). Higgins & Kram (2001) identified that the strength of the mentor relationship was one of two factors defining mentorships, the other being the mentor's location. Relationship strength was identified by mutual appreciation, reciprocity, and satisfaction with communication frequency (Higgins & Kram, 2001; Noe et al., 2002). In a study by Finkelstein (2012), respect and good communication were found to be key components of high-quality mentoring relationships. Whether or not a relationship is beneficial to both the mentor and the mentee contributes to relationship strength (Allen et al., 2006a). A strong psychosocial base of the mentor relationship is built by trust, mutual benefit, and appreciation for each other (Kram, 1983; Noe et al., 2002). In modeling the developmental network changes of business school graduates over time, Dobrow & Higgins (2019) measured relationship strength by assessing both emotional closeness and frequency of communication.

Organizational Efforts to Retain Public Health Nurses by Mentorship

Supportive Leadership. Supervisors and managers at public health agencies who exhibit mentor-like qualities can promote nurse retention. When a manager serves as a coach and role model to younger nurses, the result can be a more supportive work environment that promotes

professional development and psychological safety (Ulep, 2018). The perception of supportive leadership is highly important for young nurses. Mentorship can be part of leadership's supportive strategies for young nurses. Supportive leadership was identified as the most important factor for job satisfaction for Millennial nurses in a study of inpatient and outpatient nurses practicing in a large medical center (O'Hara et al., 2019). Psychiatric nurses identified mentor-like support from their supervisors as key for their retention (Perkins et al., 2023). Mid-career nurses shared that feeling valued by their leaders contributed to their decision to stay with their employer (Crossen & Hunter Revell, 2024). Eby et al., (2015) found that mentoring support from supervisors contributed to improved social behaviors with others at work. Wald (2020) reflected on the importance of trauma-informed and emotionally intelligent leadership in supporting public health professionals during the Covid-19 pandemic. Mentors and other public health leaders can impact the psychosocial well-being of public health nurses by being responsive and empathetic during times of workplace stress (Wald, 2020).

Formal Mentorship Programs. Leader support is necessary for mentoring programs to be successful. In a study of hospital nurse managers, managers acknowledged that mentorship supports the professional development and retention of new nurses while conceding that the time needed for mentoring is difficult to find in an understaffed organization (Berndtsson et al., 2024). Organizational efforts to establish formal mentoring programs need to focus on training the mentors to provide high levels of support. Mentor training that includes listening, counseling, coaching and principles of adult learning improves the capacity of mentors to support mentees (Ramaswami & Dreher, 2010). Formal mentoring outcomes have at times fallen short of informal mentoring experiences in quality and quantity of functions received (Allen et al., 2005; Chao et al., 1992). However, Wanberg et al. (2003), proposed that mentees can still gain much

from formal mentoring if they are satisfied with the relationships. Designing research-informed formal mentoring programs will increase the likelihood that good outcomes will be experienced (Stoeger et al., 2021).

Peer mentoring programs allow employees to learn from same-level colleagues, make friendships and receive valuable personal support. Peer coaching or mentoring can be a cost-effective mentoring model for new employees and those seeking to meet professional or personal goals (Parker et al., 2015). Learning through role modeling is more effective from a peer than from a superior (Allen et al., 2006a).

Group mentoring can be a viable option for organizations to provide mentoring when there are fewer mentors than people who desire mentoring. In a case study of a group mentoring program for university women, the group mentoring model enhanced the mentees experience beyond a typical dyad relationship because participants made beneficial connections with multiple mentors and peers (McCormack & West, 2006). Strategic collaboration, a group mentoring model that matched two senior university professors with a small group of younger faculty members, was found to provide both mentoring functions and peer support for the mentees (Wasburn, 2007).

Organizational Culture that Encourages Informal Mentorship. Although research is still needed to understand the full benefits and options of developing mentorship at an organizational level, evidence already exists that close supportive internal agency relationships improve organizational environments (Allen et al., 2017). Mentorship opportunities were equally beneficial for employees at frontline, managerial and senior leadership levels as discovered in research by Bozionelos (2004) in a university setting. If agencies invest and support mentoring relationships, employees at all levels and organizations could benefit (Bozionelos, 2004).

Whether or not public health organizational leaders develop formal mentoring programs or not, they can promote informal mentoring in two ways. First, by providing opportunities for interaction between employees of all levels of the organization, senior level, mid-level, and frontline employees can become acquainted and move into mentoring relationships informally (Kram, 1985; Turban et al., 2002). Informal peer mentorships, peer socialization, and work friendships are important relationships that can be encouraged at the workplace to improve employees' work environment and experience (Morrison & Nolan, 2009; Allen et al., 2017). Workplace design and opportunities to interact with others during training and work gatherings can be conducive to employees meeting each other and forming important informal relationships (Methot et al., 2018).

Secondly, developing a culture that rewards professional development, and mentoring can encourage informal mentor relationships to develop and support the growth of both mentors and mentees (Kram, 1985, Turban et al., 2002). Organizations can provide guidance on understanding the importance of developmental network relationships and encourage reflection and purposeful building of thoughtful collaborations at work (Christou et al., 2017).

State-led Efforts to Support Mentorship. State-led efforts to mentor and support public health nurses can also contribute to public health nurse job satisfaction and retention. In Georgia, the Department of Public Health piloted a nurse residency program with the goal of supporting new public health nurses in their roles (Ulep, 2018). In North Carolina, the Department of Public Health initiated a mentorship program for directors of nursing at local health departments (NCPHN, 2022; Watts Isley et al., 2024). The Region IV Training Public Health Center also has a mentor model that is offered for use at public health agencies (Region IV Public Health Training Center, 2021).

Gaps in Current Research and this Study

Public Health Nurse Focus

Much of the past research on how mentorship affects nurse retention included nurses in hospital settings. Only two studies focused exclusively on retention of public health nurses and included measurements of how mentorship influenced retention (Watts-Isley et al., 2022; Campbell et al., 2020). Because public health nurses' work, environment and job stressors vary from those in clinical settings, more targeted research is needed (Watts-Isley et al., 2022). This study addressed this gap by only including public health nurses as participants and having retention as the outcome of interest.

Mentorship Attributes and Public Health Nurse Retention

How various mentorship factors affect both public health nurses as mentors and mentees, including employee retention, is an area that needs more research (Wanberg et al., 2003). The same researchers also identified a gap in understanding how external mentors affect employees compared to internal mentors. External mentors may provide less support for employees to grow in their role and may increase the chance of early attrition (Wanberg et al., 2003). Understanding how different types of mentors affect public health nurses can better guide public health leaders in crafting conducive work environments for retention. This study asked participants to identify if their mentors were internal or external, thereby increasing understanding of the influence of the location of mentors on mentee retention.

Effectiveness of Formal vs. Informal Mentorship for Public Health Nurse Retention

Mentor relationships are considered informal or formal, depending on how they began, their structure and duration. Informal mentorships develop between individuals through mutual agreement for the primary benefit of the less skilled or less advanced person. Formal

mentorships develop through direction and guidance from the organization (Ragins & Kram, 2008). Watts-Isley's study demonstrated mentorship's benefit for public health nurse retention, but whether informal or formal mentorship has a stronger association with intent to stay for public health nurses is unknown (Watts-Isley et al., 2022).

A gap in the literature exists regarding how to best create formal mentor programs that provide mentoring functions and benefits to participants that are like (or better than) informal mentorships (Scandura & Pellegrini, 2010). Public health agencies could benefit from increased mentoring at the workplace if formal programs can be designed to produce good outcomes for mentors, mentees, and the organizations. As public health agencies adapt existing formal mentorship models or design their own, it is important to understand which model aspects contribute to PHN retention.

This study measured the intent to stay rate for public health nurses who report informal, formal and no mentor networks. Additionally, the three functions of mentoring and the strength of the mentor relationships were assessed for both informal and formal relationships. This study's findings contributed to the published literature by heightening understanding if there is a difference in public health nurses' intent to stay with their employers depending on what type of mentorship they have experienced.

The Effects of Being a Mentor for Public Health Nurse Retention

Having a mentor has been associated with the intent to stay with their agency for hospital and public health nurses, but it is not clear if being a public health nurse mentor is also associated with intent to stay (Watts-Isley et al., 2022; Brook et al., 2019; Cottingham et al., 2011). If public health mentors have higher retention than non-mentors, health department leaders could facilitate and encourage more of their experienced public health nurses to become

mentors to increase retention of experienced nurses. The agency would benefit from lower turnover costs and lower vacancy rates (Leider et al., 2023b; Nei et al., 2015). Public health nurses would benefit from less work overload because vacant positions for mandated services would be filled. The community would benefit from staff stability and more years of experience, and continuity of public health services (Williams et al., 2021). This study examined whether public health nurses who participated as mentors had higher or lower intent to stay rates compared to non-mentors.

The Effects of a Mentor-like Supervisor for Public Health Nurse Retention

Supervisory characteristics and support are important factors for nurse retention. In the 2021 PH WINS study, 57% of public health employees indicated that one reason that they stayed with their employer was satisfaction with their supervisor (Leider et al., 2023a). McGuire (2007) found that mentor-like supervisors provided more career benefits to mentees in the military setting than informal mentors. Nei et al., (2015) discovered having supportive leadership was conducive to nurse retention. Little is known if public health nurses, in particular, who have a supervisor who fills the role of mentor for them is an effective retention strategy. This study measured whether having a supervisor with mentor-like qualities was associated with an intent to stay with their employer for public health nurses.

Mentor Racial Concordance and Public Health Nurse Retention

Although racial concordance in mentoring was not associated with retention in some studies, the effect of racial concordance in mentoring for public health nurses is unknown (Turban et al., 2002; Dreher & Cox, 1996). A recent study showed that racial concordance within mentor relationships improved medical residents' experience (Harris et al., 2021). Latinx nurse leaders in a recent study indicated that having an ethnically similar mentor would have improved

their career experience (Canli & Aquino, 2024). It is not understood whether having a mentor of the same race is an important factor for public health nurses' intent to stay. This study compared the stay intention rates of public health nurses of color who had mentors with whom they did not share the same race or ethnicity with those who had at least one mentor of the same race or ethnicity in their network.

Reasons Why Public Health Nurses Might Return to Public Health

The reasons why public health nurses intend to leave or have left the field of public health are well documented including salary, job stress, lack of professional development, poor work environment and Covid-19 response exhaustion (Roth et al., 2022; Watts Isley et al., 2022; Pourshaban et al., 2015; Bryant-Genevier et al., 2021). There is a gap, however, in understanding why public health nurses may decide to return to the field.

This study surveyed former public health nurses to discover the reasons for their premature departure from public health and under what circumstances they might agree to return. These answers inform employers what circumstances or strategies might be effective to attract former public health nurses back into their agencies. Rehiring former public health nurses, including semi-retired nurses, could be a way to fill vacancies and restore knowledge depth to total public health nursing experience in public health agencies that have a high vacancy rate and inexperienced employees.

Developmental Network Patterns of Public Health Nurses

Since Higgins & Kram (2001) proposed a lens of developmental network to understand mentoring, there have been numerous studies that have applied their concepts to different careers including nursing faculty, medical faculty, other professors, graduates of business school, and Korean workers (Volkert, 2021; Xu & Payne, 2014; Christou et al., 2017; Cummings & Higgins,

2006; Lee, 2019). However, how public health nurses experience their network of mentor relationship has not been studied to my knowledge. This study used the developmental network model of Higgins & Kram (2001) and observed how it might explain public health nurses' intent to stay dependent on their mentor network.

Theoretical Framework

Social Network Theory

The theoretical basis for the study comes from Social Network Theory (SNT) and the developmental network model of Higgins & Kram (2001). Social Network Theory is a suitable lens for understanding the complexity of mentorship relationships because of its defined constructs and accompanying research results. The goal of this theory was to explain relationships as a complex series of connections that people build to meet their needs. Social Network Theory was developed by researchers to better understand a variety of group relationships including friendships, advice circles and work associations (Higgins & Kram, 2001; Brass, 1984; Krackhardt, 1990). Social network researchers developed concepts to explain how relationship characteristics influence participants in social circles. Constructs such as range, density, strength of ties and racial concordance are used to measure relationship dynamics and predict outcomes or network involvement (Higgins & Kram, 2001; Ibarra, 1995). Social Network Theory informed this study to better understand public health nurse mentorships using several of its constructs including strength of relationships and racial concordance.

Developmental Network Model

Foundational theoretical understanding of mentor relationships focused on one-on-one relationships of mentors and mentees. Researchers uncovered benefits of the traditional two-person relationship in multiple studies including impactful psychosocial and professional support

for development of the mentee (Scandura & Williams, 2004; Kram, 1985; Higgins & Kram, 2001). Career support could include increased access to influential relationships and career advice while psychosocial support could include counsel, camaraderie, and friendship (Higgins & Kram, 2001).

However, understanding mentorship relationships in terms of individual connections is incomplete. Mentorship is increasingly conceptualized as a network of relationships. Researchers became aware that mentorship relationships often exist in more dynamic and complex networks and should be understood in context with each other (Higgins & Kram, 2001). In line with the Social Network Theory, Higgins and Kram's developmental network model defined four developmental, or mentorship, types of relationships that employees can experience. Variables that affect the characteristics and outcomes of the network types depend on whether the mentors are external or internal to the mentee's organization and whether the mentor relationships are strong or weak (Higgins & Kram, 2001). A traditional network pattern exists when the mentor(s) are internal, and the relationship(s) are strong. A network is considered receptive when the mentor(s) are internal, and the relationship(s) are weak. The mentor network is called entrepreneurial when the mentor(s) are external to the mentees agency and the relationship(s) are strong. The type of network is considered opportunistic when the mentor(s) are external, and the relationship(s) are weak (Higgins & Kram, 2001).

Each network type has predicted results for the mentee. For this research study, the outcome of interest was how the network type affects employee retention. Higgins and Kram (2001) hypothesized that a traditional mentor network type (internal and strong relationships) would be most associated with agency retention since strong internal relationships would encourage agency affiliation. Conversely, an entrepreneurial network type (external and strong

relationships) would be most associated with employee attrition since mentor relationships could expose mentees to new opportunities outside of their current employer (Higgins & Kram, 2001).

This study used the term "mentor" interchangeably with Kram's and Higgin's term "developer" as these two terms are considered equivalent in Ragins' and Krams' Handbook (Ragins & Kram, 2007). Based on SNT, this framework was tested to see if mentor network type affects retention of PHNs. Dobrow et al., (2012) revisited developmental network theory, reviewing research that had shed light on mentorship in the subsequent decade. If a mentorship relationship was of mutual benefit to both the mentor and mentee, the relationship was considered strong. Xu & Payne (2014) noted that satisfaction with and strength of the mentor relationship, were key indicators of a mentorship's impact on mentees including the employee's intent to stay with the employer.

Key Terms Used in this Study

Public Health Nurse

Public health nurses' definition is critical to understanding their experience with retention. Public health nurses who work in local, state, regional, tribal, or federal health departments are more easily defined than those who work in community-based organizations, schools, and universities (Kneipp et al., 2022). For this study, any registered nurse working in local, regional, state, tribal or federal health department agencies or in pre-school through high school systems was considered a public health nurse. Additionally, registered nurses who self-identify with the public health nurse definition of the American Public Health Association were included as participants. According to the American Public Health Association's Public Health Nursing section, a public health nurse is a nurse who promotes and protects the health of populations using knowledge from nursing, social, and public health sciences (ANA, 2022).

Mentorship

Researchers studying mentorship have not always defined the mentor role consistently. This leads to ambiguity in participant answers and results (Dougherty & Dreher, 2007). Defining employee mentorship is accomplished referencing several studies. Higgins and Kram (2001) specify that mentors engage with mentees to promote their career growth by providing career and psychosocial developmental support. Both Higgins and Kram (2001) and Mezias and Scandura (2005) defined influential people who were inside or outside of the mentee's organization as important mentor contributors. Huybrecht et al., (2011) defined mentorship as a long-term relationship that provides support to new employees at work without evaluation or assessment components. Lankau & Scandura (2002) defined mentors in their study as people at the workplace with more advanced experience who take interest in the employee with the goals of mentee's career advancement and promotion. Meier (2013) emphasized the role modeling aspect of mentorship to nurture and support a new nurse colleague's personal and professional development. Ragin's & Cotton (1999) asserted that a mentor does not have to provide all the functions of mentorship and may only provide one.

In this study, a mentor was defined as a person, other than a supervisor, who takes an interest in helping someone else grow professionally by providing role modeling and support for learning new skills, psychosocial support, and/or support for career growth (Ragins & Cotton, 1999). This study's questionnaire defined a mentor for public health nurses as, "a person who takes an interest in helping someone else grow professionally by providing role modeling (for example, shadow opportunities such as inviting you on a home visit or teaching you about the research they are working on), psychosocial support (for example discussing professional identity as a public health nurse, providing support during challenges and being available to

listen to your concerns) and/or support for career growth (including explaining organizational culture, offering public health nursing career growth ideas, and introducing you to influential people).” Participants were asked to identify up to three mentor relationships that they had at the time of the survey or within the past year. Participants who did not have a mentor were asked if they desired one and the reasons why they did not have one. Former public health nurses were asked if they had a mentor at their last public health employer within the last year before they left that agency.

Mentor vs. Other Influential People

Mentor Role. Differentiating the role of mentor involves defining what the role includes and does not include. Eby and colleagues, in their chapter of mentor definition in The Blackwell Handbook of Mentoring, assert that mentor relationships are unique, dynamic, learning experiences that support the mentee through role modeling, psychosocial and career-related means with the purpose of mentee professional growth and development (Eby et al., 2010). However, non-mentors can provide any of the mentoring functions (career support, role modeling or psychosocial support). Ideally, the functions are most effectively experienced by recipients when there is a mentor relationship as well (Haggard et al., 2011). In other words, employee assistance can be a stand-alone experience for the purpose of teaching a certain activity in the absence of an ongoing supportive relationship, mutuality, or emotional closeness but it would not be considered a mentorship (Eby et al., 2010).

Supervisor Role. The supervisory relationship is a similar, yet distinct relationship, to mentorship. Unlike mentors, supervisors assess performance, have organizational authority over the nurses they supervise, assign work tasks and provide job orientation and onboarding instruction for employees to learn their roles (Johnson, 2007). Transformational leadership style

is more like mentorship than any other leadership style but attends more to the goals of the organizations rather than the individual mentee (Ragins & Godshalk, 2007). Still, some supervisors may take on functions of mentors such as providing psychosocial support, role modeling and career development guidance under some circumstances with good results (Johnson, 2007).

In this study, public health nurses were asked about their relationship with their supervisors to ascertain if the relationship also had mentorship qualities and if having a mentor-like supervisor was associated with intent to stay. Scandura & Williams (2004) found that supervisory mentors had more influence on mentees than non-supervisory mentors in the areas of organizational commitment, satisfaction at work and career optimism. This study assessed whether supervisory mentors increased PHNs' intent to stay at the same or different rate as non-supervisory mentors. This study also compared if intent to stay rates for public health nurses were different or the same for those who had supervisors who were like or not like mentors to them.

Coach Role. Coaching is like mentorship but usually is more goal oriented and may be self-limited once the coaching goal is complete (Gray, 2010). Internal workplace coaching has its place for performance improvement but lacks the long-term, comprehensive psychosocial benefits of mentoring (Jones et al., 2016).

Mentor vs. Non-mentor

For this study, a mentor was defined as a non-supervisor who provided work, career, and/or psychosocial support to a public health nurse over time to help the nurse succeed. A mentor may work at the mentee's organization or at another organization. The mentor usually has more experience than the mentee and may be a peer or have a higher rank in the

organization. This mentor definition is like that of researchers Van Emmerik et al., (2005) which leaves the definition open for internal and external mentors and those paired by formal and informal means. Each study participant was asked to determine if they had up to three mentors and defined those relationships with clarifying questions. The mentor may or may not have been a nurse as mentorship can occur cross-professionally.

For this study, the mentor relationship was defined as one that provides at least one of three benefits to a nurse: role modeling, psychosocial support, and/or assistance for career growth (Huybrecht et al., 2011; Newman, 2017; Chao, 2007; Dougherty & Dreher, 2007). Intent to stay with one's organization was asked of those who served as mentors and compared with non-mentors. A mentor was defined as a nurse who had served as a formal or informal mentor to a colleague at work within the past year. A non-mentor was defined as a nurse who had not served as a mentor to a colleague in the past year. The intent to stay rates of these two groups of public health nurses were compared to ascertain if providing mentorship may affect intent to stay with their public health nurse employer.

Formal vs. Informal Mentorship Structure

Mentorships can be formed spontaneously through the mutual agreement of individuals or matched by a third party as a planned strategy of an organization (Eby et al., 2010). Knowing how a relationship was formed is important when evaluating mentorship at work. However, Haggard et al., (2011) noted that in some research studies on mentoring, there has not been a distinction made whether the mentor relationships were formally or informally initiated. The origins of mentor relationships are important to know, however, since there are benefits and challenges to both types of mentorships. Which type of mentor relationship is better for mentee retention under what circumstances is still unclear and needs further study (Pfund et al., 2016).

For this study, formal mentorship was defined as matched by the organization in a planned mentor program such as a planned peer mentor program, a new hire program or a mentor program for employees learning a new role. The formal mentor relationship could have been established by the nurse's employer or provided through a professional, state or regional program. Informal mentorships were defined as those formed by individuals, independent of an employee-sponsored planned strategy.

Internal vs. External Mentors

Nurses may have mentors from inside or outside their organization due to various circumstances. Nurses may have had internally established mentorships that survived when one of the parties moved to a new organization, thus becoming external. Nurses may meet a colleague through a professional association or a conference and start a mentor relationship that would be considered external. Higgins and Kram (2001) theorized that strong external mentors would increase attrition away from the mentees' organization due to exposing the mentee to new career realities and employment opportunities. Dougherty & Dreher (2007) agreed that there may be a conflict of interest between the benefits of external mentors for the individual and the organization for the same reasons. However, there may be situations when external is preferable to internal mentorship from both the perspective of the mentee and the organization. One study found that finding external mentors for new nursing faculty improved their success at their new positions (Dunlap et al., 2023). Haggard et al., (2011) notes that many studies have unfortunately excluded the possibility of external mentors and have only asked participants about mentors within their workplace.

This study distinguished between internal and external mentor relationships to ascertain any association with retention that may be of interest to public health organizations. If having

external mentors is associated with more public health nurse turnover, public health employers would not be advised to unethically interfere with external mentorships, but they may want to strengthen opportunities for internal mentorships to tip the retention balance in their favor. Or public health leaders might want to be aware that when a key employee mentor moves away from the organization, reaching out to the exiting person's mentees with the intent to fill the void could contribute to staff retention. For this study, if the nurse reported more or an equal number of internal compared to external mentor relationships, the location of the primary mentor relationship determined the network definition since participants were asked to list their strongest mentor relationship first.

Strong vs. Weak Mentorship Ties

The developmental network theory of Higgins and Kram (2001) indicated that the strength of relationship ties may influence the decision-making of the mentee regarding organizational loyalty and longevity. According to Higgins and Kram's theory, when an employee experiences strong mentor-mentee relationships with internal mentors, it is more likely the employee will remain with the agency than if the relationships are weak. Higgins & Kram (2001) discussed that the strength of developmental relationships should consider reciprocity, frequent communication, and mutual positive regard. Haggard et al., (2011) agreed that ongoing communication should be a third measurement of mentorship strength. Xu & Payne (2014.) found that satisfaction with mentoring was more predictive of employee retention than the number of mentors. Dobrow & Higgins, (2019) measured relationship strength as psychological closeness and frequency of communication. These measures had a high rate of correlation with each other.

For this study, the strength of a mentor relationship was measured by mentee's perception of psychological closeness. If the average strength score of the mentor relationships was 3 or greater, the network was considered strong.

Racial Concordance of Mentees and Mentors

Homophily is the attraction of people to others like themselves. Researchers have found that relationships with people of similar backgrounds are easier to form and participants more likely enjoy trust, better communication, and mutuality than with others who are different than themselves (Lincoln & Miller, 1979; Kanter, 1977; Ibarra, 1995). In a qualitative study of Latinx nurse leaders, Canli & Aquino (2024) found that one of the challenges faced by Latinx nurses was a lack of mentors with whom they could relate freely. Rivera-Goba & Nieto (2007) found in their qualitative study of Hispanic nurses that while only 18% had ethnic concordant mentors, all would have liked a Hispanic mentor. Smith et al., (2001) recommended that one way to encourage minority PHN retention was to offer racially concordant mentors, even if the mentor needed to be external due to a lack of candidates at the public health agency.

This study investigated if public health nurses of color who have mentors of the same race or ethnicity as them in their network had different rates of intent to stay than public health nurses of color who had only non-concordant mentors. Racial concordance was considered positive for each relationship if the nurse's racial or ethnic self-designation was the same as the mentor's. If the public health nurse of color had at least one mentor of the same race or ethnicity as themselves in their network, their network was considered racially concordant.

Intent to Leave

The assertion that a nurse intends to leave the organization within 12 months was this study's indicator of attrition. Intent to leave, or the reverse, intend to stay, are reliable ways that

researchers have used to measure future staff attrition. In a review of nurse turnover studies, Nei et al., (2015) found correlation between intent to leave assertions and actual attrition among nurses. The reliability of the question was confirmed by Leider et al., (2023a) when they compared intent to leave questions with actual departures. Intent on leaving indications compared to departures were almost equivalent when considering the total public health workforce. However, public health executives and managers were more likely to state they were leaving than subsequently leaving and workers under 35 years old were more likely to leave than say that they were going to leave their agency (Leider et al., 2023a). Some of the respondents in the PH WINS study who had previously indicated that they planned to leave their public health employer ultimately decided to stay indicating that their workplace and their job satisfaction had improved (Bogaert et al., 2019). This finding gives hope to employers that intent to leave tendencies can be reversed if there are agency improvements to the work environment that improve staff morale.

Watts-Isley et al., (2022) asked NC public health nurses about their intent to leave in the next three years in their study and found that mentorship had a negative association with intent to leave their organization. Public health nurses who had mentors were also less likely to perceive that their agency had a problem with staff retention. The Watts-Isley study survey data was gathered in 2019 from frontline NC public health nurses before the Covid-19 pandemic.

In this study, currently employed and formerly employed public health nurses and public health nurse supervisors were surveyed to determine their intent to stay or leave their employer or their reasons for having already left their public health employer. This study assessed whether having a mentor (or being a mentor to others) since the Covid-19 pandemic was associated positively with intent to stay with their public health employer. The nurses' mentor network

pattern, type of mentorship experiences (formal vs. informal and strong vs. weak), racial concordance of mentors, and supervisor's style were also analyzed and compared with regards to intent to stay with their employer.

Chapter 3: Methodology

Study Design

This was a cross-sectional quantitative study collecting data by means of an online survey to examine the relationship between public health nurse retention and five variables related to mentorship. To allow participants to elaborate on their reasons for leaving their public health employers or why they would or would not be interested in returning to public health nursing, six open-ended questions were included which produced a limited amount of qualitative data.

Measures

For current public health nurses, retention was the outcome variable measured by indication of PHNs' intent to stay for the next 12 months with their current public health employer. There were five independent or exposure variables under investigation:

1. Formal vs informal mentorship
2. Traditional vs other developmental mentor network patterns
3. Experience of being a mentor vs no experience of being a mentor
4. Having a supervisor who acts as a mentor vs supervisor who does not act like a mentor
5. Racial concordance with mentor vs mentee and mentor who do not share the same ethnicity or race

Similar variables were examined for former public health nurses who had already left the public health nursing field. All five exposure variables of interest were categorical and dichotomous. Four of the measures were straightforward and required 1-2 survey questions to determine. The developmental network pattern measure was more complex, and categorization of developmental network type required more analysis depending on how many mentor

relationships each public health nurse had. Each measure is further defined in the following sections.

Formal vs. Informal. Determining the origin of each mentor relationship was accomplished by a single survey question, "Were you matched with this person by a formal mentor program (planned by your employer such as for new hires or peer mentor programs) or did the match happen informally (you and your mentor decided to start meeting and talking)?". The first mentor relationship each public health nurse chose was the relationship analyzed for mentor type. Participants were instructed to select their strongest current mentor relationship to describe first in the survey. Knowing the type of mentorship may increase understanding how mentorship affects intent to stay outcomes for public health nurses.

Experience Being a Mentor. Whether the public health nurse had been a mentor to another colleague at the time of the survey or in the past year was discovered using a single question, "In the past year, have you been a mentor to someone at work?". Serving as a mentor was analyzed to see how this experience may have been associated with public health nurses' intent to stay.

Having a Mentor-like Supervisor. One question was used to determine if public health nurses perceive that their supervisors acted like mentors towards them. After defining that mentor-like supervisors provide role modeling opportunities, psychosocial support and/or career growth support, the survey asked, "Do you consider your supervisor to be like a mentor to you?". Asking about participants' experience with this supervisory style allowed for analysis of how supervisors' style may affect PHNs' intent to stay.

Racial Concordance with Mentor. For this measure, participants were asked about their own and their mentors' ethnic and racial demographics. For participants and mentors, the

ethnicity question, “What is your ethnicity?” gave options of “Hispanic”, or “non-Hispanic”. The racial demographic question, “What race do you most identify with?” gave participants answer options of “African American or Black”, “Asian”, “Native American, American Indian or Alaska Native”, “Native Hawaiian or other Pacific Islander”, “White”, or “other”. If a participant’s and any mentor’s ethnicity or race were the same, the public health nurse was identified as having a racially concordant mentor. Intent to stay rates of Hispanic and non-white participants (BIPOC) were compared considering if they had a racially concordant mentor or not.

Developmental Network Patterns. The most complex measure in the study was the developmental network pattern. Higgins and Kram’s (2001) developmental network model used two variables that determine the type of mentor network an employee experiences: strength of the relationship ties and location of the mentors. Thus, identifying what type of mentor network a PHN experienced required several steps: definition of the strength of each mentor relationship, definition of the location of each mentor, and then determination of the type of the network. This study included only non-supervisory mentors in the mentor network analysis.

The four developmental network types defined by Higgins & Kram (2001) were Traditional (strong mentor ties with mentors in the same organization as the mentee), Receptive (weak mentor ties with mentors in the same organization as the mentee), Entrepreneurial (strong mentor ties with mentors outside the mentee’s organization) or Opportunistic (weak mentor ties with mentors outside the mentee’s organization) (Figure 1). According to Higgins & Kram’s model, employees with Traditional developmental networks are the most likely to stay with their employers and those with Entrepreneurial developmental networks are the most likely to leave their employers.

Figure 1: Developmental Network Typology

Traditional Developmental Network Strong mentorship ties AND in same organization as mentor(s) ***Most likely to stay***	**Receptive** Developmental Network Weak mentorship ties AND in same organization as mentor(s)
Entrepreneurial Developmental Network Strong mentorship ties AND in different organizations than mentor(s) ***Least likely to stay***	**Opportunistic** Developmental Network Weak mentorship ties AND in different organizations than mentor(s)

From Higgins, M. & Kram, K. (2001). Reconceptualizing Mentoring at Work: A Developmental Network Perspective. . 270. The Academy of Management Review, 26(2), 264-288. https://10.2307/259122. Fair use and modified with permission from the author.

Strength of Ties for a Mentor Relationship. The strength of mentorship ties was defined in the original theoretical paper by Higgins & Kram (2001) as a combination of three relational aspects: emotional connection, mutual benefit and communication frequency but there was no empirical measurement of tie strength in that paper. In their 2006 paper, Cummings and Higgins measured strength of ties as a three-dimensional concept that assessed length of relationship, emotional closeness and frequency of communication (Cummings & Higgins, 2006). In 2019, Dobrow and Higgins published longitudinal research on how developmental networks change. They defined relationship tie strength using two measures: emotional closeness and frequency of communication (Dobrow & Higgins, 2019). Comparing these two tie strength dimensions revealed that emotional closeness and communication frequency scores moved over time as

parallel concepts. If closeness was high (or low), frequency was high (or low). The slopes of change over time were also parallel and had similar slopes. Both the intercepts and the slopes of emotional closeness and communication frequency were significantly correlated (Dobrow & Higgins, 2019). When Lee (2019) measured relational tie strength in developmental networks, only one question was asked to determine tie strength: emotional closeness. In personal communication with Dr. Monica Higgins, the researcher confirmed that relationship strength could be accurately measured by either a question about emotional closeness or frequency of communication (Higgins, 2024 personal communication).

Because of the similarities of slope, intercept and correlation in the Dobrow & Higgins (2019) study and Dr. Higgins confirmation, I also decided to use one single question to measure tie strength, emotional closeness. I used the same question format and answer options as Dobrow & Higgins (2019) and Cummings & Higgins, (2006). However, I reversed the order of answers to indicate higher scores for closer relationships. This study's version of the question was as follows in a multiple-choice format: "Very close relationships are characterized by high degrees of liking, trust, and mutual commitment. Distant relationships are characterized by not knowing the person very well or by having very little liking, trust, and mutual commitment: How close are you to this person? (1) distant, (2) less than close, (3) close, (4) very close."

The emotional closeness scores ranged from 1-4 for each mentor relationship. The network strength was calculated as the average of all the emotional closeness scores for the participant. A total score of 3.0 or greater was considered "strong" and any score less than 3 was considered "weak". An average score was calculated rather than a sum since mentor networks can be of differing sizes and thus would skew the variable if participants with small networks were compared to those with larger ones. The average emotional closeness score was used in the

study by Dobrow & Higgins (2019) to determine network strength.

Calculating the Location of a Mentor Relationship. Location of the mentor was defined as working inside or outside of the employee's organization. In this study, the location of each mentor was measured by a question about where each mentor worked. The two potential answers (inside or outside of the nurse's organization) made this question dichotomous. If the participant stated that the mentor currently worked at the same employer, the mentor location was considered "internal". Working elsewhere defined the mentor location as "external".

Defining the Strength of Ties and Location of the Mentor Network. To determine if the public health nurse's developmental network was Traditional, Receptive, Entrepreneurial or Opportunistic, the network's overall mentor ties' strength and predominant location of the mentors were calculated by combining the information from each mentor relationship. If the participant only entered information for one mentor, the strength of ties and location of that mentor was equivalent to that of the network. For example, if the single mentor relationship was determined to have weak ties with an external mentor, the network would be considered Opportunistic.

If there was more than one mentor relationship, the network was labeled strong if the average emotional closeness score was 3.0 or greater since 3.0 was the score for a "close" relationship. For example, if the public health nurse had three mentor relationships with emotional closeness scores of 3.0, 3.0 and 4.0, the overall network strength was a score of 3.33 and considered strong.

The network was labeled internal if there were more internal mentors compared to external mentors. If there were an even number of mentors (i.e., one of each), the location designation defaulted to the location of mentor #1 since the instructions in the survey asked

participants to start with their strongest mentor relationship. If this same nurse identified two of the three mentors as working at the same organization, the network was considered internal. Thus, this strong, internal mentor network was labeled Traditional. For this study, if the developmental network was calculated to be other than Traditional, the nurse's network type was considered "Other" since the traditional network type was being tested to see if it was associated with staying with the employers as proposed by Higgins & Kram (2001). This variable was dichotomous since the Traditional network type was compared to all other network types in a collapsed group.

Data Collection

Data for the study came from a non-random, convenience sampling of current and former public health nurses living in three US states. The data was collected by surveying public health nurses from North Carolina, Minnesota and Oregon using the Qualtrics survey tool. The North Carolina Board of Nursing made registered nurse (RN) member lists available that were sorted for public health, community health and school health specialties. The Minnesota Department of Administration made the current public health nurse list available to researchers. The NC and MN lists included names, email addresses, home addresses, county of residence and RN license numbers. The Oregon Board of Nursing made their list of RNs with similar information and their employers' names available. North Carolina RNs with specialties in public health, school health and community health were included in the participant pool. The entire list of the public health nurses of Minnesota was invited to participate. Registered nurses in Oregon listing public and community health employers were sent invitations. Additionally, North Carolina RNs with public health, school health and community health specialties on a 2017 NC Board of Nursing list but no longer on the 2023 list were included. If a public health nurse reported that they had

moved to a state other than the three in the study, they were still included in the study.

Utilizing existing state boards of nursing lists to invite research participation increased the likelihood that respondents were registered nurses. Surveys were anonymously collected. No participant identifiers were requested or retained. Public health nurses from three states were included to increase the sample size and provided respondent diversity from across the United States, including a southeastern, midwestern and pacific northwest state.

The registered nurse lists included 7,458 current NC public health nurses, 1,325 former NC public health nurses, 981 MN public health nurses and 167 OR public health nurses for 9,931 potential participants. Of these potential participants, all the OR and active NC public health nurses had email addresses on the available lists. Those missing email addresses but having home addresses included 67 of the inactive NC public health nurses and 3 of the MN public health nurses. A total of 9,861 public health nurses with emails were invited to participate in the study. A total of 602 surveys were received for a response rate of 6.1%. Of the 602 respondents, 9 PHNs only answered 1 question and did not continue the survey, and another 67 nurses identified that they worked in fields other than public health, thus ending the survey for them. The final sample included 259 from former or retired PHNs and 267 from current PHNs. See Appendix E for a diagram of PHN recruitment.

All identified public health nurses on the lists with email addresses were offered the opportunity to participate. Sampling was not used. Surveys were sent out using the Qualtrics distribution feature following IRB and dissertation committee approval in the summer of 2024. Up to two reminders were sent to public health nurses who had not yet responded to complete the survey 1-2 weeks after the initial email. The survey was emailed to each public health nurse on the lists between July 1 and August 9, 2024. The survey closed to additional responses on

August 20, 2024. Originally, there were plans to send out USPS paper mailings if the response rate was below 10%, but this strategy was not chosen because most of the current PHNs had email addresses. Because the survey was anonymous, I did not know who the non-responders were, and the USPS mailing would have been sent to some who had already responded.

Survey Details

Pilot Study. A pilot survey was conducted with 21 public health nurses to test the survey length, distribution and wording. Feedback from the pilot tester guided me to reduce the length of the survey by eliminating a question about length of time as a nurse, reduce the number of mentor assessments from four to three, improve the survey introduction, troubleshoot sending the survey using the Qualtrics platform and calculate the average length of time participants took to complete the survey.

Final Survey. Most participants took less than 10 minutes to complete the survey. After the screening and demographic sections, respondents were guided through questions by the Qualtrics tool depending on their status as current or former PHNs, mentorship history and answers to questions about retention.

***Demographic*.** The survey included demographic questions including profession, current work status, age range (which translates to the generation of participant), gender, state of residence, race, and ethnicity. The work history questions included years working in public health nursing, years at current employer, level of nursing education achieved, current employer type, whether working full-time or part-time, whether working as a supervisor or consultant and if the agency had a formal mentoring program.

Mentorship Descriptions. This section of the survey asked participants to describe any mentor relationships for up to three mentors. Information about each mentor's race, ethnicity,

gender, and work location was ascertained. Participants were asked if the mentor relationships were established formally or informally. The Mentor Function Questionnaire's (MFQ-9) nine questions that rate the mentor functions (role modeling, career support and psychosocial support) were asked about the first mentor (See Figure 2). The strength of each mentor relationship was assessed using an emotional closeness question. The mentors' work location and the strength of the relationship questions allowed the mentor network to be categorized as one of four network patterns.

Figure 2: Mentoring Functions Questionnaire (MFQ-9)

MFQ-9 Responses: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
Career Support
1. My mentor takes a personal interest in my career
2. My mentor helps me coordinate professional goals.
3. My mentor has devoted special time and consideration to my career.
Psychosocial Support
4. I share personal problems with my mentor.
5. I exchange confidences with my mentor.
6. I consider my mentor to be a friend.
Role Modeling
7. I try to model my behavior after my mentor.
8. I admire my mentor's ability to motivate others.
9. I respect my mentor's ability to teach others.

Castro, S. & Scandura, T. (2004). Used with permission. Castro, S. L., & Scandura, T. A. (2004, November 3-6). The tale of two measures: Evaluation and comparison of Scandura's (1992) and Ragins and McFarlin's (1990) mentoring measures. Paper presented at the Southern Management Association Meeting, San Antonio, TX

Supervisor Characteristics. This section of the survey asked participants in a single question whether their supervisor acted like a mentor for them. The same demographic questions that were asked of the mentors and an edited version of the MFQ-9 that replaced "mentor" with "supervisor" assessed the supervisor relationship (Figure 2). Answers in this section determined if the public health nurse considered their supervisor to be like a mentor.

Additional Mentorship Experiences. Public health nurses were asked if they had been

mentors to someone else at work in the past year. This question added to the understanding whether being a mentor was associated with intent to stay at their public health employer. For public health nurses who did not have a current mentor, reasons why were explored with the option to choose as many answers as applied, such as the absence of a formal mentoring program at their agency or previous negative experiences with a mentor.

Retention Details. The survey ended for current public health nurses with questions about their intent to stay with or leave their employer in the next 12 months. Those who planned to leave were asked about their reasons for leaving such as retirement, low salary, or budget cuts. Those who planned to retire were asked if they would consider returning to a public health employer under certain conditions.

For Former Public Health Nurses. If the nurse was not a current public health nurse but had worked in public health nursing before, the same mentor and supervisor questions were asked about their experience at their last public health employer. Additionally, the former public health nurses were asked why they left their last public health employer and if they would consider returning to a public health nursing position under certain conditions such as if a higher salary was offered or part-time work was available.

Qualitative Questions. At the end of the survey for current and former public health nurses, questions allowed personally crafted answers. These open-ended questions provided qualitative data regarding intent to leave, reasons why nurses left public health employers and factors that may entice them back into public health nursing.

Generational Distinctions. Research has revealed generational differences in nurse retention trends with younger nurses most likely to leave agencies soon after being hired. The survey asked about the age of participants as a generational category. The generational categories

that are currently in the workforce include Silent/Traditionalists (born 1925-1945), Baby Boomers (born 1946-1964), Gen X (born 1965-1980), Millennials (born 1981-1996) and Gen Z (born 1997-2012). Grouping the age of participants can aid in discovering if certain independent variables may affect public health nurses from each generation differently and what factors could improve their intent to stay with their employers.

Mentor Function Measurement. One mentoring assessment tool used to measure the functions of mentoring is the Mentor Functions Questionaire-9 (MFQ-9). The MFQ-9 was developed by Castro & Scandura (2004) (Pellegrini & Scandura, 2005). The scale measures the three mentor functions of career support, psychosocial support and role modeling using nine questions on a 5-point scale. This scale measures three broadly agreed upon mentoring functions. Using an established questionnaire for mentoring adds to the research literature of mentor functions and the influence that each may have on the outcome variable of public health nurses' intent to stay. The 5-point scale ranges from "strongly disagree" to "strongly agree". The level of support received by the mentee in each function of mentoring may be a mediating factor for PHN retention. Model analysis included the MFQ-9 assessment to better understand PHN retention.

The PHN participants were asked questions about their mentor relationships for up to three mentors to assess their developmental network pattern. However, the MFQ-9 tool was only used for the first mentor relationship chosen by the participant. In the survey instructions, the participants were asked to describe their strongest mentor relationship first. Each MFQ-9 score for mentors and supervisors was assessed to see if the MFQ-9 scores were good indicators for intent to stay or intent to leave. The use of MFQ-9 scores is consistent with other researchers who have used the tool to measure mentor function levels (Rios, 2024; Adedokun, 2014).

Data Analysis

Tools and Materials Used to Analyze Data. Qualtrics was used to create, administer, and distribute the survey. Since all responses were anonymous with no identifying information collected, there was no need for a confidentiality compliant survey tool. Once the data was collected, the data was downloaded into an Excel spreadsheet. By combining network strength and location of mentors, each participants' type of developmental network was identified as Traditional (strong and internal) or "Other" if Receptive (weak and internal), Entrepreneurial (strong and external) or Opportunistic (weak and external) (Higgins & Kram (2001).

Visualization of Quantitative Data. All the variables were categorical except the MFQ-9 mentor function scores, mentor strength scores and network strength scores, which were discrete numerical data and were treated as numeric data. Demographic, outcome and independent variables of interest were visualized in frequency tables and segmented bar charts to understand an overview of the categorical data collected. Descriptive statistics of the key independent and outcome variables were presented in tables.

The research questions were analyzed comparing PHNs who indicated intent to stay compared to PHNs who indicated intent to leave voluntarily. Those who indicated intent to retire or anticipated job loss were not included in the research questions analysis since the goal was to improve retention by reducing intent to leave voluntarily. Some analysis was conducted as it pertained to understanding if retirees might return to public health. Participants who indicated they anticipated a job loss in the next year were excluded from the research question analysis because this reason was beyond the scope of this study.

***Key Variables*.** To understand the distribution key variables, certain data for current and former PHNs was visualized with frequency tables and optionally with bar charts:

Demographic variables

1. PHN working status – current, former and NA
2. Current and former public health employer- LHD, state., FQHC, community-based, school, university, hospital, other and NA
3. State of residence- NC, MN, OR, other and NA
4. Gender- male, female, and other and NA
5. Ethnicity – Hispanic and non-Hispanic and NA
6. Race- African American/Black, Asian, Native American, White, other and NA
7. Generation- Gen Z, Millennial, Gen X, Baby Boomer, Silent and NA
8. Years as PHN- less than 1 year, 1-2, 3-5, 6-10, 11-15, 16-20, 21-25, 26-30, over 30 and NA
9. Nursing education- diploma, ADN, BSN, Master's, DNP and NA

Work questions for current and former PHNs

10. Years at current or former PH employer - less than 1 year, 1-2, 3-5, 6-10, 11-15, 16-20, 21-25, 26-30, over 30 and NA
11. Formal program at work- yes, no, I don't know and NA
12. Supervisor or consultant- yes, no and NA

Mentor questions for current and former PHNs

13. Has/had a mentor- yes, no and NA
14. Has/had been a mentor – yes, no and NA
15. How matched- formal, informal and NA

Supervisor of current and former PHNs

16. Supervisor like mentor – yes, no and NA

Current PHN retention questions

17. Plans with current employer – retire, non-retirement reasons, involuntary, stay, other and NA
18. Non-retirement reasons – new PH employer, leave PH, leave nursing, stop working, own business, school, eldercare, childcare, moving, other and NA

Former PHNs retention questions

19. Reason left former PH employer – retire, non-retirement reasons, involuntary, stay, other and NA
20. Non-retirement reasons left former PH employer – new PH employer, leave PH, leave nursing, stop working, own business, school, eldercare, childcare, moving, other and NA
21. Consider returning – yes, no, not sure and NA
22. Conditions to return to PH – salary, benefits, flexibility, PT work, better supervisor, recuperation, childcare, eldercare, easier work, other and NA
23. Not returning reasons – retired, better fit, mental health, physical health, flexibility, Covid, salary, no PT, not planning to work, other and NA

MFQ-9 Scoring. The MFQ-9 mentor function scores for current PHNs' supervisors and primary mentors were visualized in a Likert chart. Tables showed the MFQ-9 questions and how supervisor and mentor scores were related to retention.

Developmental Network Type. The strength of ties and location of mentors were combined as described earlier to determine the type of developmental mentor network of each public health nurse. These were visualized in a 2 x 2 table with options being Traditional or Other.

Visualization of Qualitative Data. Six questions in the survey allowed for open-ended

answers and produced qualitative data: current PHNs' plans to leave their employer; current PHNs' thoughts about retirement and possible return to public health; current PHN's perspective on staying with their employer; former PHNs' reasons for leaving their employer; former PHNs' conditions desired to return to public health nursing; and former PHNs' reasons for not returning to public health nursing. The responses, or exemplars, were grouped by themes and sub-themes and displayed in descriptive charts. Themes emerging for each question were described with exemplar quotes from participants.

Statistical Analysis

Quantitative Independent Variables and Outcome Variable. The unadjusted analysis was performed first to understand the bivariate relationships in the research questions. The relationships between the outcome variable, intent to stay, and each of the independent variables (formal vs informal, developmental network type, experience of being a mentor, supervisor like mentor and racial concordance) were analyzed using Fisher's Exact Test and displayed using 2 x 2 tables and segmented bar charts. The results were examined for distribution patterns and initial impressions of the data. Additional tables were developed depending on the results of the analysis. Any interesting relationships between the outcome variable and exposure variables or between exposure variables themselves were visualized and discussed in the narrative.

Modeling. The percentage rate of public health nurses who intend to stay with their employer were analyzed considering the effect of each of the independent variables. Logistic regression was used to model the relationship between intent to stay (the response variable) and the explanatory and demographic variables. Possible covariate interactions involving generation, schedule, being a mentor, having a mentor-like supervisor, ethnicity and race were examined in the logistic models. Various logistic models were fit to the data and Receiver Operator Curves

(ROC) analysis was used to assess the final model(s). Data analysis was accomplished using the statistical software R Core Team (2023).

Qualitative Data. Qualitative analysis steps described by Yin (2016) were used for compiling data, disassembling data, reassembling data into themes, interpreting data and drawing conclusions about data. The program director for the East Carolina University Doctor of Public Health, Health Policy, Administration and Leadership program and I independently coded the qualitative data and then met to reach consensus on themes and sub-themes.

Summary of Findings

Demographic data were summarized in charts and graphs. Unadjusted findings of the research questions were summarized in descriptive charts, frequency tables and bar charts. Narrative descriptions of findings including data patterns and impressions were included. The adjusted models that best predicted public health nurses' intent to stay with their employer were discussed. Model testing methods used to determine the best predictive models were described. Observations of demographic or variable trends and interaction between variables were summarized. Qualitative data was summarized and discussed as results related to quantitative data on the same topic.

Obstacles Encountered and Overcome

Reaching Public Health Nurses to Include in the Study. Finding a way to invite many public health nurses to participate in the study without compromising the validity of the participants as verified registered nurses working in the public health field was a challenge. Sending the survey link to health directors or directors of nursing and asking them to share with the public health nurses in their agency was considered as a strategy. This would have reached many public health nurses at local health departments but would have had a risk that non-nurse public health staff would have answered the survey. In some public health programs, social

workers, health educators and other public health staff work alongside public health nurses on the same teams. In some cases, such as care management programs, social workers and nurses hold similar roles. There would have been a risk to the validity of the study if non-nurses participated.

Some health departments and community health organizations employ licensed practical nurses, certified medical assistants, certified nursing assistants, and registered nurses. If health department or community organization leaders were the ones to ask for participation, these healthcare workers may have mistakenly thought they were part of the target group and completed the survey. Posting the survey information on local, state, or national public health websites or distribution through public health listservs would have run the same risk of non-nurses participating in the study. One way to increase receptiveness to the survey but not jeopardize the validity of respondents was to ask the NC Chief Public Health Nurse to send out a memo to her public health nurse listserv encouraging them to watch their emails for the study and to reach out to me if they had any questions.

Utilizing state boards of nursing lists was a good way to target registered nurses only for the survey invitation distribution. However, most states' boards of nursing do not make their member lists available to the public. Those that do share their registered nurse lists do not always include emails or members' practice specialty, such as public health, as part of the list information. Using the internet, I was able to locate 47 states' boards of nursing or equivalent websites and additionally contacted several by email to clarify the makeup of their lists. I was unable to find any information for three state boards of nursing. Thirty-six boards of nursing do not make their lists available to the public, including for research purposes. One nursing board does not provide emails or addresses on their list. Four state boards of nursing make a list

available, but they do not include emails or practice specialty. Three available state board lists have emails, but no specialty listed, so public health nurses would not be the only ones receiving the invitation, thus increasing the chance that non-PHNs would participate.

Only one state, North Carolina, provides their registered nurse member lists with both specialty, emails and mailing addresses. The Minnesota Board of Nursing provides a list of only registered nurses with Bachelor of Nursing degrees and a public health certification that includes emails and mailing addresses. Oregon provides their list of registered nurses with emails, mailing addresses and employer names. The Oregon list does not specify nursing specialties, but the list can be filtered for health department and community-based employers that would likely hire public health nurses. Oregon nurses who are not public health nurses but received the survey invitation because their employers seemed to be likely public health employers, were able to decline to participate when they read the public health nurse definition in the survey.

Finding Former Public Health Nurses. I wanted to include former public health nurses in the study to investigate their reasons for leaving their public health agency and any difference their mentoring experience might be compared to current public health nurses who were planning to stay with or leave their employers. Where to find this population was a challenge. State boards of nursing that do release lists to the public make the list available as of the date of request. Thus, information about nurses who were on previous lists was no longer available. I did, however, locate a NC Board of Nursing RN list from January of 2017. Public health nurses who were on the 2017 list but no longer on the 2023 list were presumed to be inactive as public health nurses either because they changed specialty, retired, allowed their license to expire or moved to a new state to continue working in public health. Nurses who had name changes during the six elapsed years were cross referenced by their nursing license number to verify that they

were or were not still on the current list. Although the three 2023 RN lists could have included PHNs who had left the field recently, the bulk of the PHNs in the study who had left the field came from the 2017 filtered list.

Effectiveness of the Study Approach

The approach chosen for the study involved collecting new data from public health nurses in three states. The student could not answer the research questions from existing data available. Thus, to explore how public health nurses' intent to stay was associated with the five independent variables, new survey data was needed.

A conventional study approach was selected with original data collected from participants through an online survey. The only aspects of the study approach that were unusual were the use of a previous board of nursing list to identify former public health nurses and the grouping of participants by their generations. The older list was effective in including former public health nurses even though it included numerous inactive email address returns due to the age of the list. Grouping participants by their generation was an effective strategy since generational differences surfaced in stay intention rates.

The decision to only use outreach to public health nurses through their state boards of nursing lists may have limited the number of respondents. Inaccurate email addresses, failure of PHNs to notice email invitations, email provider firewalls and wariness to respond to unsolicited emails all reduced the response rate of the survey. Although the use of the lists increased the likelihood that respondents were public health nurses, using other avenues such as local health department connections or state public health organizations as the professional networks of public health nurses might have increased the number of participants in the study.

Chapter 4: Results

The results chapter reports the study sample's demographic characteristics, the research questions' results and other quantitative findings of interest. Qualitative findings for each open-ended question are presented.

Descriptive Characteristics of the Sample

Demographic Characteristics

Current and former public health nurses completed the survey during July and August of 2024. Of the 9,861 public health nurses invited to participate, 602 responded. The final sample included surveys from 259 former PHNs and 267 current PHNs.

Current PHNs. Current public health nurses in the sample were primarily female (97.8%), white (82%), and non-Hispanic (95.9%). The most represented generation was Generation X (born 1965 to 1980) with 47.6%, followed by Baby Boomers (born 1946 to 1964) with 30.3% and Millennials (born 1981 to 1996) with 18.7% of the respondents. Generation Z (born 1997 to 2012) and Silent Generation participants (born before 1946) made up less than 3% each. The most common highest nursing education degree achieved by current PHNs were BSN (53.6%), Masters (22.5%), and ADN (16.5%). Local health departments (44.2%), and K-12 schools (12.4%) were the most represented public health employers.

Nearly 20% of current PHN participants had been working in the nursing field for 16-20 years, 15% for 11-15 years, and 14% for 21-25 years. The largest percentage of current PHNs had been employed at their current agencies for 3-5 years (22.5%), 16-20 years (15.4%), 1-2 years (15%), 11-15 years (15%) or 6-10 years (14.6%). Most of the respondents worked full-time (82%) and more than 55% were frontline nurses. About one-fifth of the participants

were aware that there was a formal mentorship program at their agency. Full demographic details for current PHN participants can be found in Table 1.

Former PHNs. Like the current PHNs, the 259 former public health nurses in the sample were primarily female (97.3%), white (85.3%), and non-Hispanic (97.3%). However, the former PHNs were primarily from the generation of Baby Boomers with 65.3%, followed by Generation X with 21.2%, and Millennials with 8.9% of the respondents. Generation Z nurses with 0.8% and Silent Generation nurses with 3.1% of participants were the least represented groups. The most common highest nursing education degree achieved by former PHNs were BSN (41.3%), Masters (29.3%), and ADN (21.6%). As was the case with current PHN participants, the most represented former public health employers were local health departments (54.8%), followed by K-12 schools (11.6%). Most of the former PHNs had worked full-time (89.6%) for their last public health employer and 59.5% worked in frontline positions. Like current PHN participants, 21% of former PHNs knew of a formal mentor program at their previous employer. For more details of the demographic details of the former PHN participants, see Table 1.

Characteristics	**Current PHNs (2023) (n=267)**	**Former PHNs (2017-2023) (n= 259)**
Gender (%)		
Male	3/267 (1.1%)	6/259 (2.3%)
Female	261/267 (97.8%)	252/259 (97.3%)
NA	3/267 (1.1%)	1/259 (0.4%)
Race/ethnicity (%)		
White	219/267 (82%)	221/259 (85.3%)
Black	33/267 (12.4%)	26/259 (10%)
Native American	5/267 (1.9%)	3/259 (1.2%)
Asian	2/267 (0.7%)	0
Others	6/267 (2.2%)	5/259 (1.9%)
NA	2/267 (0.7%)	4/259 (1.5%)
Ethnicity (%)		
Hispanic	9/267 (3.4%)	5/259 (1.9%)
Non-Hispanic	256/267 (95.9%)	252/259 (97.3%)
NA	2/267 (0.7%)	2/259 (0.8%)
Race/Ethnicity (%)		

BIPOC	52/267 (19.5%)	36/259 (13.9%)
Non-BIPOC	213/267 (79.8%)	219/259 (84.6%)
NA	2/267 (0.7%)	4/259 (1.5%)
Employer (%)		
Local health department	118/267 (44.2%)	142/259 (54.8%)
State or Fed	22/267 (8.2%)	21/259 (8.1%)
FQHC	12/267 (4.5%)	7/259 (2.7%)
Community	25/267 (9.4%)	27/259 (10.4%)
School	33/267 (12.4%)	30/259 (11.6%)
University	11/267 (4.1%)	7/259 (2.7%)
Hospital	13/267 (4.9%)	9/259 (3.5%)
Other	33/267 (12.4%)	12/259 (4.6%)
NA	0	4/259 (1.5%)
Generation (%)		
Gen Z	6/267 (2.2%)	2/259 (0.8%)
Millennial	50/267 (18.7%)	23/259 (8.9%)
Gen X	127/267 (47.6%)	55/259 (21.2%)
Boomer	81/267 (30.3%)	169/259 (65.3%)
Silent/Traditional	1/267 (0.4%)	8/259 (3.1%)
NA	2/267 (0.7%)	2/259 (0.8%)
Nursing Education (%)		
Diploma	5/267 (1.9%)	10/259 (3.9%)
ADN	44/267 (16.5%)	56/259 (21.6%)
BSN	143/267 (53.6%)	107/259 (41.3%)
Masters	60/267 (22.5%)	76/259 (29.3%)
DNP	10/267 (3.7%)	8/259 (3%)
NA	5/267 (1.9%)	2/259 (0.8%)
Years as PHN (%)	**Current PHNs**	**Former PHNs**
< 1 year	2/267 (0.7%)	6/259 (2.3%)
1-2 years	12/267 (4.5%)	16/259 (6.2%)
3-5 years	26/267 (9.7%)	29/259 (11.2%)
6-10 years	37/267 (13.9%)	34/259 (13.1%)
11-15 years	41/267 (15.4%)	41/259 (15.8%)
16-20 years	54/267 (20.2%)	35/259 (13.5%)
21–25 years	38/267 (14.2%)	33/259 (12.7%)
26-30 years	24/267 (9%)	27/259 (10.4%)
30+ years	31/267 (11.6%)	34/259 (13.1%)
NA	2/267 (0.7%)	4/259 (1.5%)
Years at PH employer (%)		
< 1 year	10/267 (3.7%)	15/259 (5.8%)
1-2 years	40/267 (15%)	32/259 (12.4%)
3-5 years	60/267 (22.5%)	38/259 (14.7%)
6-10 years	39/267 (14.6%)	45/259 (17.4%)
11-15 years	40/267 (15%)	36/259 (13.9%)

16-20 years	41/267 (15.4%)	31/259 (12%)
21–25 years	21/267 (7.9%)	27/259 (10.4%)
26-30 years	8/267 (3%)	18/259 (7%)
30+ years	6/267 (2.2%)	13/259 (5%)
NA	2/267 (0.7%)	4/259 (1.5%)
Position time (%)		
Full time	219/267 (82%)	232/259 (89.6%)
Part-time	45/267 (16.9%)	23/259 (8.9%)
NA	3/267 (1.1%)	4/259 (1.5%)
Position type (%)		
Supervisor/consultant	117/267 (43.8%)	101/259 (39%)
Frontline	148/267 (55.4%)	154/259 (59.5%)
NA	2/267 (0.7%)	4/259 (1.5%)
Formal mentorship at agency (%)		
Yes	57/267 (21.3%)	55/259 (21.2%)
No	190/267 (71.2%)	191/259 (73.7%)
PHN does not know	18/267 (6.7%)	9/259 (3.5%)
NA	2/267 (0.7%)	4/259 (1.5%)

Table 1. Demographic Description of the "Staying on the Team" Study Sample

Mentorship Experience

Current PHNs. Over one-third (38.2%) of current PHNs had a mentor in the past year. Of those with mentors, 23.5% had more than one mentor. A mentor was desired by 15% of the current PHNs who did not have mentors. The most common reason for not having a mentor was the absence of a formal mentoring program at their agency. Nearly six out of ten current PHNs had mentored another colleague in the past year. Most current PHNs' primary mentors worked at the same employer (75.5%). Most primary mentors were female (92.2%), White (80.4%) and non-Hispanic (96.1%). The most common mentor network type was Traditional (61.8%), meaning the relationship(s) were strong and the mentor(s) worked at the same agency as the current PHN. Current PHNs experienced informal mentorship more frequently (83.3%) than formal ones (17.6%). See Table 2 for more details of the mentor experiences of current PHN participants.

Former PHNs. Only about one fifth of former PHNs (20.8%) reported having a mentor during the last year of public health employment and 14.8% had more than one mentor. Of the former PHNs, 44% did not have, but would have liked a mentor. Not having a formal mentorship program at their former employer (29.9%) was the most common reason that former PHNs listed for not having a mentor. Like their current PHN colleagues, nearly 60% of former PHNs had mentored another colleague in the last year of public health employment. Most former PHNs' primary mentors had worked at the same employer (74.1%). Most former PHNs' primary mentors were female (88.9%), White (79.6%) and non-Hispanic (87%). The most common mentor network type for former PHNs was Traditional (59.3%), and the most common relationship type was informal (63%). Formal mentor relationships had been experienced by 25.9% of former PHNs who had a mentor in their last public health employment year. Table 2 has more details about the mentor experiences of former PHN participants.

	Current PHNs (n=267)	**Former PHNs (n=259)**
Had a mentor (%)		
Yes	102/267 (38.2%)	54/259 (20.8%)
No	163/267 (61%)	201/259 (77.6%)
NA	2/267 (0.7%)	4/259 (1.5%)
Wanted a mentor (%)		
Yes	41/267 (15.4%)	114/259 (44%)
No	72/267 (27%)	34/259 (13.1%)
Unsure	49/267 (18.4%)	53/259 (20.5%)
NA	105/267 (39.3%)	58/259 (22.4%)
Reasons no mentor (%)		
Small agency	6/267 (2.2%)	8/259 (3.1%)
No formal program	30/267 (11.2%)	60/259 (23.2%)
Not interested	10/267 (3.7%)	1/259 (0.4%)
Negative mentor experience before	0	0
I don't know how to arrange	3/267 (1.1%)	0
Everyone is too busy	4/267 (1.5%)	2/259 (0.8%)
Supervisor support is sufficient	6/267 (2.2%)	4/259 (1.5%)
Colleague support is sufficient	8/267 (3%)	6/259 (2.3%)
Had one before	1/267 (0.4%)	1/259 (0.4%)
Mentor left agency	0	3/259 (1.2%)

Few options for mentors	4/267 (1.5%)	14/259 (5.4%)
Other	9/267 (3.4%)	9/259 (3.5%)
NA	186/267 (69.7%)	151/259 (58.3%)
Had been a mentor (%)		
Yes	152/267 (56.9%)	153/259 (59.1%)
No	100/267 (37.5%)	91/259 (35.1%)
NA	15/267 (5.6%)	15/259 (5.8%)

Table 2: Mentorship Experience by PHN Category

Supervisor Relationships

Current PHNs. Current PHNs' supervisors were predominately female (84.3%), White (75%) and non-Hispanic (92.1%). Nearly half (48.7%) of the current PHNs considered their supervisors to be like mentors. For more information about current PHNs' experiences with their supervisors, see Table 3.

Former PHNs. Former PHNs' supervisors were primarily female (87.3%), White (78%) and non-Hispanic (92.3%). Only about one third (34%) of the former PHNs considered their supervisors to be like mentors to them. For more information about former PHNs' experiences with their supervisors, see Table 3.

	Current PHNs (n=267)	**Former PHN (n=259)**
Supervisor's gender (%)		
Female	225/267 (84.3%)	226/259 (87.3%)
Male	22/267 (8.2%)	18/259 (6.9%)
NA	20/267 (7.5%)	15/259 (5.8%)
Supervisor's Ethnicity (%)		
Hispanic	3/267 (1.1%)	5/259 (1.9%)
Non-Hispanic	246/267 (92.1%)	239/259 (92.3%)
NA	18/267 (6.7%)	15/259 (5.8%)
Supervisor's ethnicity same as PHN (%)		
Yes	193/267 (72.3%)	201/259 (77.6%)
No	57/267 (21.3%)	43/259 (16.6%)
NA	17/267 (6.4%)	15/259 (5.8%)
Supervisor's Race (%)		
White	200/267 (75%)	202/259 (78%)
Black	39/267 (14.6%)	34/259 (13.1%)
Native American	3/267 (1.1%)	2/259 (0.8%)
Asian	3/267 (1.1%)	1/259 (0.4%)

Others	3/267 (1.1%)	3/259 (1.2%)
NA	19/267 (7.1%)	17/259 (6.6%)
Supervisor's race same as PHN (%)		
Yes	190/267 (71.2%)	195/259 (75.3%)
No	57/267 (21.3%)	48/259 (18.5%)
NA	19/267 (7.5%)	16/259 (6.2%)
Supervisor is like a mentor (%)		
Yes	130/267 (48.7%)	88/259 (34%)
No	120/267 (44.9%)	156/259 (60.2%)
NA	17/267 (6.4%)	15/259 (5.8%)

Table 3. Characteristics of Supervisor Relationships

PHNs Retention Plans or Decisions

Current PHNs. When asked about their retention plans in the next 12 months, 63.3% of current PHN participants planned to stay with their public health employer, while 17.2% planned to leave voluntarily, 11.2% planned to retire and 2.6% anticipated a job loss. One out of every twenty PHNs (5.6%) did not share their retention plans. For more details about the current PHN respondents' retention plans and decisions, see Table 4.

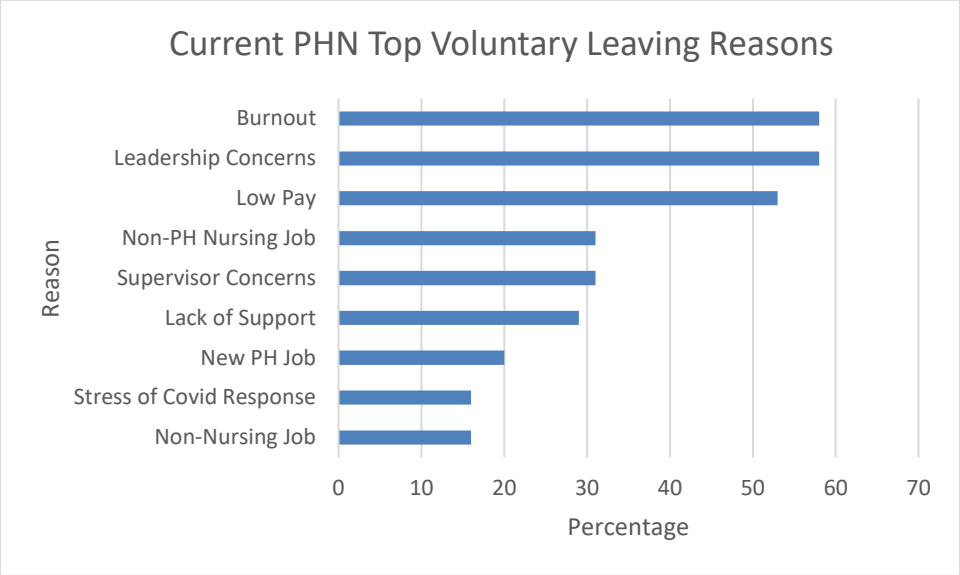
Retention intentions of all PHNs (%)	**Current PHNs (n=267)**	**Former PHNs (n=259)**
Stay	169/267 (63.3%)	NA
Leave voluntarily/Left voluntarily	46/267 (17.2%)	89/259 (34.4%)
Retire/Retired	30/267 (11.2%)	122/259 (47.1%)
Job loss anticipated/Job lost	7/267 (2.6%)	0
Other	0	12/259 (4.6%)
NA	15/267 (5.6%)	36/259 (13.9%)

Table 4: Retention Intentions of "Staying on the Team" Study Sample

Current PHNs Reason to Leave. When current PHNs were asked their employment intentions, 46 (17.2%) indicated they planned to leave in the next 12 months. When asked why they were planning to leave their employer, more than one answer was allowed. Nurses listed burnout or exhaustion and unsupportive leadership (58% each) as their most common answers. Low salary was the next most common reason for leaving (53%). An unsupportive supervisor and moving to a non-public health nursing job (31%), lack of support (29%), new public health

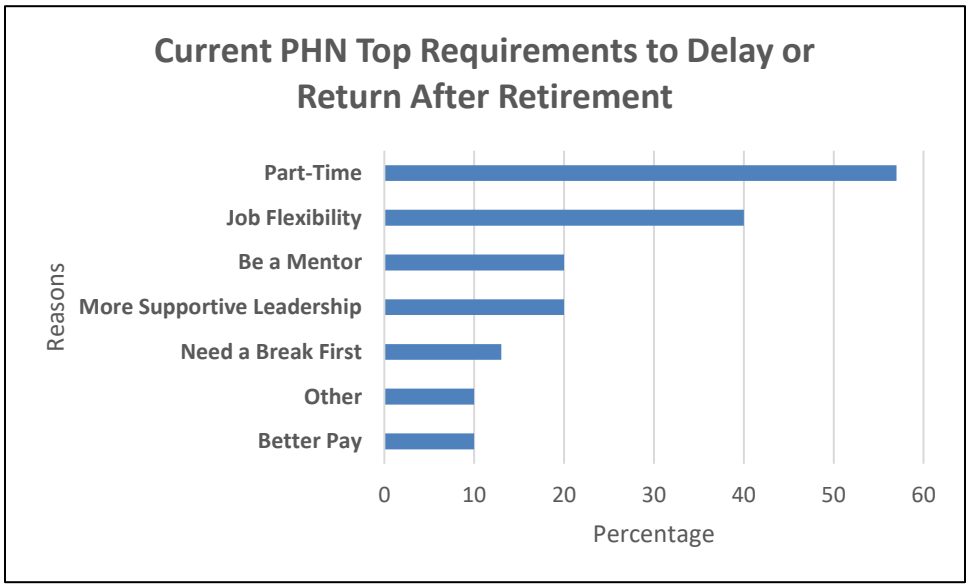
nursing job (20%), with the stress of the Covid pandemic response and finding a non-nursing job (16%) rounded off the next most common reasons for leaving. For more details, see Figure 3.

Figure 3: Current PHN Top Voluntary Leaving Reasons



Current PHNs Plans to Delay Retirement or Return to Work. Thirty current PHNs (11.2%) indicated that they planned to retire in the next 12 months. These PHNs were asked if there were any circumstances that might influence them to delay retirement or return to public health nursing after retirement. The opportunity to work part-time was the most common answer at 57% followed by a flexible, work from home option (40%). Six current PHNs planning to retire said that having the opportunity to be a mentor and having more supportive leadership would encourage them to postpone or return (20% each). Four PHNs said that they might return after taking a work break for a while (13%). Increased pay was a requirement for 10% of retiring PHNs to stay or return and 10% stated that nothing would change their minds from retiring and not returning. For more details, see Figure 4.

Figure 4: Current PHN Top Requirements to Delay or Return After Retirement

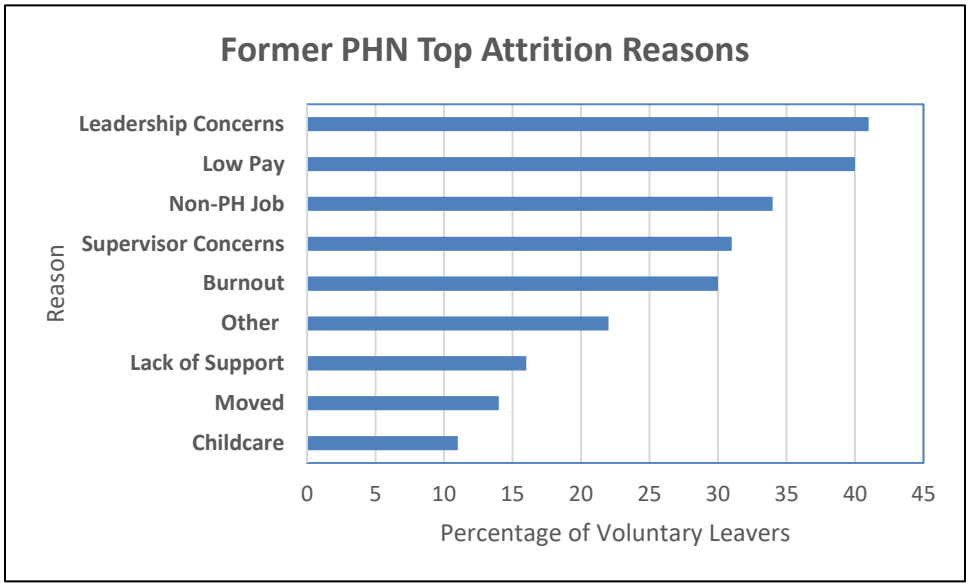


Former PHNs. Former PHNs in the study had left their public health agencies due to retirement (47.1%), voluntary reasons (34.4%) or other reasons (4.6%). Almost one in seven PHNs (13.9%) did not explain why they left their public health employer. For more details about the former PHN respondents' retention plans and decisions, see Table 4.

Reasons Former PHNs Left. Information shared by former PHN data was analyzed for a better understanding of PHN attrition, retirement and re-recruitment opportunities. More than one answer was allowed for each of the attrition questions. Registered nurses in the study who had formerly worked in public health agencies reported leaving their agencies because of retirement (47.1%), voluntary reasons (34.4%) and other reasons or no answer (18.5%). When asked why former PHNs left their public health agency voluntarily, former PHNs listed unsupportive leadership (41%), low pay (40%), unsupportive supervisor (31%), and burnout (30%). Lack of support (16%), moving away (14%), taking care of children (11%), health

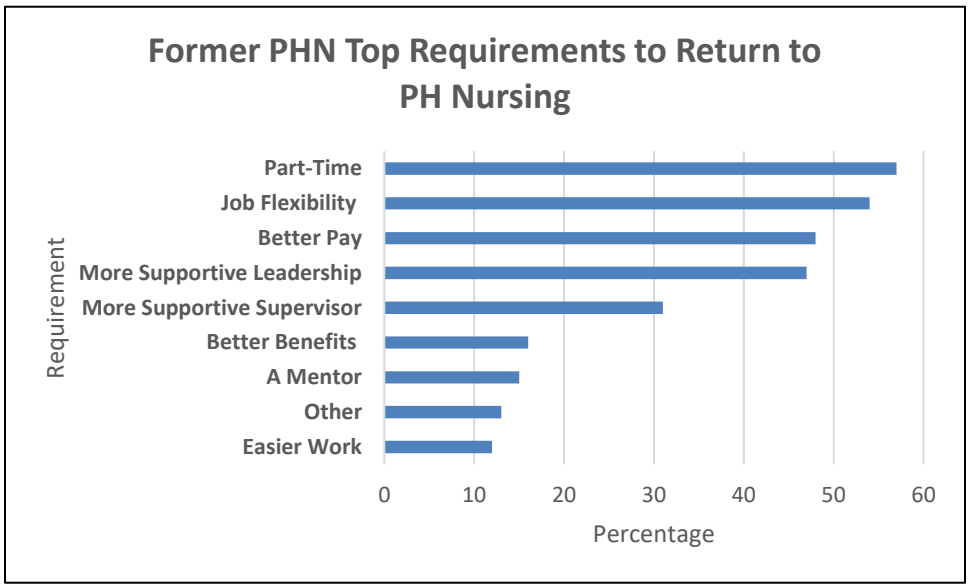
reasons (10%) and going back to school (9%) were also selected as reasons PHNs left their public health employers. Additionally, a new non-public health nursing job was listed as a reason to leave for 34% of former PHNs. For more details, see Figure 5.

Figure 5: Former PHN Top Attrition Reasons



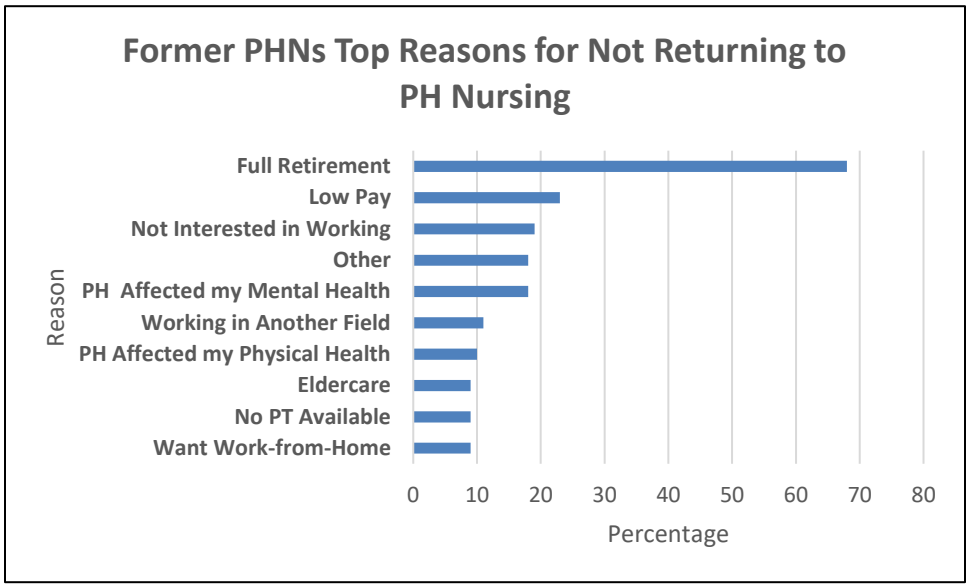
Former PHNs Requirements to Return. Half of the PHNs (50.6%) who had left public health for all reasons indicated that they would be or might be willing to return to a public health position. The two most common requirements that they listed to return to public health were part-time work (57%) and a flexible (including work from home) schedule (54%). Better pay (48%), more supportive leadership (47%), a supportive supervisor (31%), better benefits (16%) and having a mentor (15%) were also listed as requirements to return to public health work. For more details, see Figure 6.

Figure 6: Former PHNs Top Requirements to Return to PH Nursing



Reasons Former PHNs Will Not Return. About four in ten former public health nurses (42.5%) stated that they would not return to public health work. Retirement was the most common reason former PHNs stated for not returning to public health work at 68%. Low pay (23%), not wanting to work (19%), public health work seen as detrimental to their mental health (18%) or physical health (10%), working in another field (11%) and no part-time or work from home jobs available (9% each) were reasons that former PHNs did not plan to return to public health work. Providing eldercare was a reason that 9% stated for not returning to public health work. For more details, see Figure 7.

Figure 7: Former PHNs Top Reasons for Not Returning to PH Nursing



Quantitative Results

Research Questions

All the research questions pertained to current PHNs in the study. Retention was defined in the study as the current PHN's intention to stay at their public health employer within the following year. The retention rate was determined by those who indicated staying at least one year compared to those staying plus those leaving voluntarily. PHNs who were planning to retire, those who anticipated an involuntary job loss or did not answer the questions were not included in the denominator since voluntary leaving was the main category under study to improve retention.

All five research questions and other variable testing were analyzed using Fisher's Exact Test. The odds ratios without adjustment for covariates were obtained from Fisher's Exact Test. Results are statistically significant when the p-value is less than 0.05 and no formal adjustments

were made for multiple comparisons. Alternative hypotheses are two-sided (i.e., the odds ratio is not equal to 1). Logistic regression analysis was used to examine the relationship in the question after adjusting for covariates (e.g., schedule, generation, ethnicity etc.). Bivariate results of each research question are shown in Table 5 below.

For baseline information, the retention intentions of current PHNs with any mentor were compared to current PHNs without a mentor. Sample PHNs who received any type of mentorship were slightly more likely to indicate intent to stay (81%) than those who did not have a mentor (77%). This difference was not statistically significant with a p-value = 0.6; Odds ratio = 1.26. The MFQ-9 results for primary mentors also did not reveal a difference in retention rate. None of the nine questions in the assessment resulted in p-values that were less than 0.05 (Appendix D).

	1. Mentor Type Formal vs. Informal N=78	**2. Network Type Traditional vs Other N=78**	**3. Non-Mentor vs Mentor N=214**	**4. Mentor-like Supervisor Yes vs No N=213**	**5. BIPOC Mentor Yes vs No N=15**
% Stay	93% vs 78%	82% vs 79%	84% vs 75%	88% vs 67%	70% vs 80%
Missing (n)	24	24	53	54	6
P-value	0.3	1	0.1	0.0002	1
95% CI	[0.51, 181.82]	[0.27, 4.35]	[0.84, 3.83]	[1.72, 8.33]	[0.09, 112.09]
Odds Ratio	4	1.15	1.75	3.7	1.66
Difference?	No	No	No	Yes	Cannot be determined

Table 5 Current PHNs Research Questions' Unadjusted Results

Research Question #1

Is the retention rate different for public health nurses who have formal compared to informal mentor(s)?

The PHN retention rate was not significantly different between those with formal or informal mentoring experience. With unadjusted results, the odds of retention were 4 times higher for PHNs receiving formal mentorship, with a p-value of 0.3. When adjusting for variables of ethnicity and generation, formal mentorship showed an increased odds ratio of 5.88 and a p-value of 0.17. See Table 6 below.

N=78	Bivariate	Multivariate Model 4
Control Variables	None	Ethnicity, Generation2
Area Under the Curve (ROC)	0.58	0.75
Odds Ratio	4	5.88
95% CI	[0.51, 181.82]	[0.76, 192.3]
P-value	0.3	0.17
Statistical Difference?	No	No

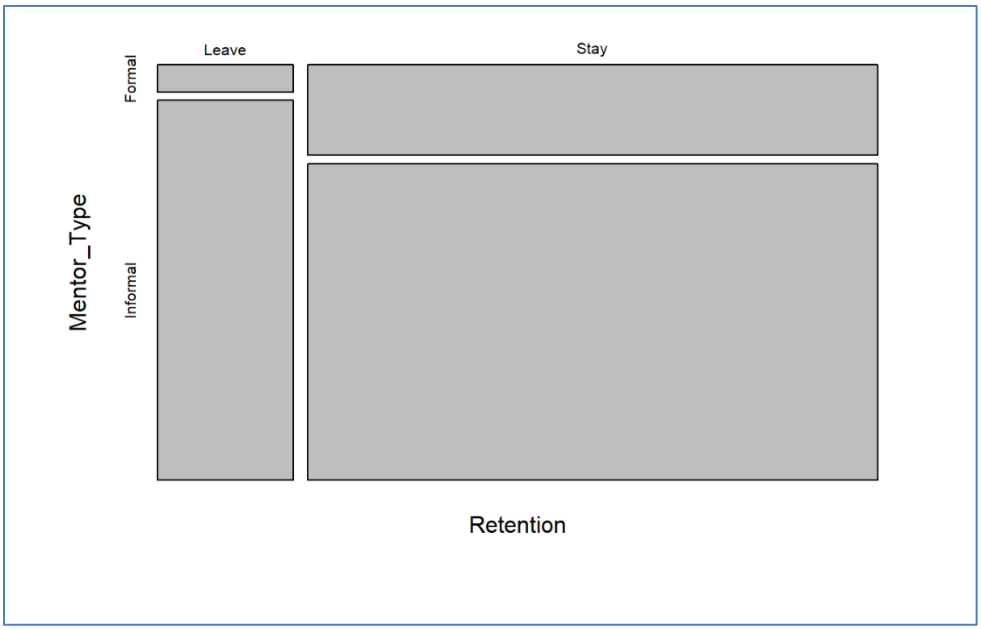
Table 6: Research Question 1: Retention and Mentor Type Results

2 x 2 Table. PHNs in the study who had received formal mentorship indicated a higher rate of stay (93%) compared to those who received informal mentorship (78%). The difference was not statistically significant with a p-value of 0.3; Odds ratio = 4 with a 95% CI [0.51, 181.82]. Unadjusted results for formal and informal mentor rates are displayed in the following 2x2 table (Table 7) and Figure 8. The bar chart shows that while PHNs with formal mentorship had higher retention, the sample size is small (Figure 8).

Mentor Type		
Retention	**Formal**	**Informal**
Leave	1/15 = 0.07	14/63 = 0.22
Stay	14/15 = 0.93	49/63 = 0.78

Table 7: Formal vs Informal Mentorship and Retention Rate

Figure 8: Bar Chart of Retention and Mentor Type



The odds ratio indicates that the sample odds of leaving for those with formal mentors is 4 times the corresponding odds for those with informal mentors. In the sample, PHNs with informal mentorship and no mentorship had nearly the same retention intention (78% vs 77%).

Controlling for Other Variables. When logistic regression modeling was used to evaluate mentor type and retention, the simple model (Retention~Mentor_Type) revealed that the relationship was not statistically significant with a p-value = 0.2; Odds ratio = 4; Estimate = -1.29. When looking at the influence of Mentor_Type on Retention while controlling variables,

several dichotomous explanatory variables were considered.

Certain variables were not used in any of the logistic regression models. The small sample size limits how many degrees of freedom could be fit into the models. Categorical variables with multiple categories, such as race or employer type, used more degrees of freedom in the models than the "rule of 10" recommends which suggests using one degree of freedom for every 10 events in the less frequent category. For small sample sizes, there may be confidence in the accuracy of results if one degree of freedom is used every 5 or more events (Vittinghoff & McCulloch, 2007). For this research question, since only 15 PHNs received formal mentorship, the degrees of freedom should be limited to no more than two variables that were dichotomous. Gender and State were not selected to be included in the modeling because of lack of diversity in the sample with 97.8% of participants being female and 89.1% being from one state (NC). Four variables were not selected because they were not dichotomous and would have used too many degrees of freedom in the models, including Race, Generation, Length of Employment, and Employer. Proxy alternatives to the multiple category variables that were tested in the models to conserve degrees of freedom included BIPOC for Race, and Generation 2 for Generation and Length of Employment. A proxy for Employer was not included because when this variable was collapsed into two categories (local health department and other employers) there was no retention difference between the two groups with a p-value = 1.

Variables tested to see if they impacted Mentor_Type's odds ratio were: Eth(ethnicity of PHN), Generation2 (younger and older age), Sponsored (if agency had a formal mentor program), Guide (if PHN was also a mentor), Schedule (if PHN worked full-time or part-time), BIPOC (if PHN was Hispanic or non-White), CSUP_Mentor (having a mentor-like supervisor) and Position (if PHN was a supervisor or frontline nurse). There were four dichotomous

variables that changed the Mentor_Type estimate or had the lowest p-value. Ethnicity (p-value = 0.12), Generation2 (p-value = 0.02), Schedule (p-value = 0.08) and CSUP_Mentor (p-value = 0.02).

The selected individual variables were added to the base model to evaluate its impact on estimate of Mentor_Type. Subsequently, more than one variable was added to test various combinations for the best model. To find the best fitted model, considering sample size, six models were tested with variables Eth, Generation2, Schedule, and CSUP_Mentor.

None of the models had a p-value of 0.05 or less. Model1: Retention~Mentor_Type +Eth+GEN2 +Sched +CSUP_Mentor had 70 degrees of freedom and a p-value of 0.33. Model2: Retention~Mentor_Type+Eth+Sched had 73 degrees of freedom and p-value of 0.25. Model3: Retention~Mentor_Type+Gen2+Sched had 72 degrees of freedom and 0.36 p-value. Model4: Retention~Mentor_Type+Eth+Gen2 had 73 degrees of freedom and a p-value of 0.17. Model5: Retention~ Mentor_Type +Gen2+CSUP_Mentor had 73 degrees of freedom and a p-value of 0.36. Model6: Retention~Mentor_Type+Sched+ CSUP_Mentor had 73 degrees of freedom and a p-value of 0.49.

The area under the curve ROC test for the simple model, Retention~Mentor_Type, was 0.58, i.e., the model explained retention only 8% better than chance. The ROC values for the six tested models were as follows: Model1 with 0.84, Model2 with 0.72, Model3 with 0.79, Model4 with 0.75, Model5 with 0.81 and Model6 with 0.74.

The best fitting model was Model4 Retention~Mentor_Type+Eth+Generation2 since it had the lowest p-value of 0.17 while having 73 degrees of freedom. The odds ratio remained similar at 5.88 and the estimate remained negative at -1.37. In summary, multivariate testing with logistic regression revealed there was not enough evidence to reject the claim of no effect of

mentor type on PHN retention.

Research Question #2

Is the retention rate different for public health nurses with a traditional mentorship network pattern (strong internal agency mentor relationships) compared to those with other types of mentorship network patterns?

There was not enough evidence to reject the claim of no effect of mentor network type on PHN retention. With unadjusted results, the odds of retention were 1.15 in favor of traditional mentor network types with a p-value = 1. When adjusting for variables (generation and having a mentor-like supervisor), the relationship leaned toward traditional mentor network types showing slightly worse retention with an odds ratio of 0.79 and a p-value of 0.72. See Table 8 below. In other words, the unadjusted analysis showed that PHNs with Traditional mentor networks had a higher retention rate than those with other types of networks and when covariates were added, PHNs with other network types had a higher retention rate. Mentor networks were defined by their strength and mentor location. The network was considered Traditional if the network was strong (as indicated by the average of the closeness question(s)) and internal to the PHN's agency. All other network types (either weak relationships, external or both) were defined as Other. Of the 78 PHNs networks, 54 were categorized as Traditional and 24 were other types of mentor networks.

N=78	Bivariate	Multivariate Model 3
Control Variables	None	Generation2, CSUP_Mentor
Area Under the Curve (ROC)	0.52	0.79
Odds Ratio	1.15	0.79
95% CI	[0.27, 4.35]	[0.35, 5.2]
P-value	1	0.72
Statistical Difference?	No	No

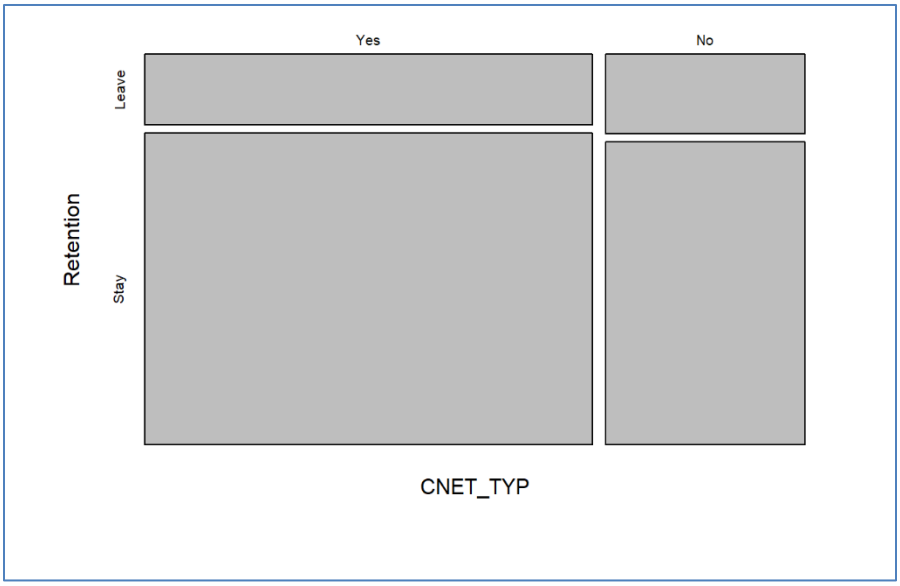
Table 8: Research Question 2: Retention and Mentor Network Type Results

2x2 Table. PHNs in the study with a Traditional network had slightly higher stay intention rates (82%) compared to those with other network types (79%). The network types did not have a statistically different stay intention rate with a p-value = 1; Odds ratio = 1.15 with a 95% CI [0.27, 4.35]. The odd ratio indicates that the sample odds of leaving for those with a Traditional mentor network is 1.15 times the corresponding odds for those with other mentor networks. Unadjusted traditional and other mentor network types of retention rates are displayed in the following 2x2 table (Table 9) and Figure 9.

Mentor Network Type		
Retention	**Traditional**	**Other**
Leave	10/54 = 0.19	5/24 = 0.21
Stay	44/54 = 0.82	19/24 = 0.79

Table 9: Mentor Network Type and Retention Rate

Figure 9: Bar Chart of Retention and Mentor Network Type



Note: CNET_TYP equals "yes" means that the mentor network type was Traditional.

If only network strength is examined, 83% of the networks were reported to be strong compared to 16% that were considered weak. Of those with strong mentor networks, 83% indicated stay intentions compared to those who with weak mentor networks with a 69% rate of stay intentions. PHNs in the study with strong mentor networks had higher stay retention intentions with a p-value = 0.3.

If only the location of mentor network is examined, 81% of the PHNs had internal networks compared to 19% who had external networks. Of those with internal networks, 79% indicated an intention to stay compared to those with external networks with an 87% rate of stay intentions with a p-value of 0.7.

Controlling for Other Variables. First, CNET_TYP (current PHN mentor network type) was analyzed alone to see the effect on retention using logistic regression modeling. Subsequently, explanatory variables were added to the model to find a good fitting model. The model Retention~CNET_TYP, had an odds ratio of 0.86, estimate of -0.24 and p-value of 0.81. This indicated that sample odds of staying for those with a non-Traditional mentor network was

0.86 times the corresponding odds of those with a Traditional mentor network.

When looking at the influence of CNET_TYP on retention while controlling variables, Gender, State, Race, Generation, Length of Employment and Employer were not selected for the model because of reasons described earlier in Q1. Variables tested to see if they impacted CNET_TYP's odds ratio were: Eth, Generation2, Sponsored, Guide (had been a mentor), Schedule, BIPOC, and Position, Mentor_Type and CSUP_Mentor. There were five dichotomous variables selected: Eth (p-value = 0.15), Generation2 (p-value = 0.99), Schedule (p-value = 0.049), Mentor_Type (p-value = 0.2) and CSUP_Mentor (p-value = 0.009).

To find the best fitted model, considering sample size, with the lowest p-value, seven models were tested. Once controls were added the relationship shifted in favor of nontraditional networks having a higher odd of retention for the study participants. Models 1-6 all had odds ratios in favor of other network types and retention.

None of the models had a p-value less than 0.05. Model1: Retention~ CNET_TYP+Eth+ Schedule + CSUP_Mentor had 72 degrees of freedom and a p-value of 0.7. Model2: Retention~CNET_TYP +Gen2+Schedule had 72 degrees of freedom and a p-value of 0.78. Model3: Retention~CNET_TYP+GEN2+CSUP_Mentor had 73 degrees of freedom and a p-value of 0.72. Model4: Retention~CNET_TYP+Schedule +Mentor_Type +CSUP_Mentor had 72 degrees of freedom and a p-value of 0.76. Model5: Retention~ CNET_TYP+Schedule +CSUP_Mentor had 73 degrees of freedom and a p-value of 0.83. Model6: Retention~ CNET_TYP +Eth+CSUP_Mentor had 74 degrees of freedom and a p-value of 0.77. Model7: Retention~CNET_TYP+Eth+Schedule had 73 degrees of freedom and a p-value of 0.98.

The area under the curve ROC test for the simple model Retention~CNET_TYP was minimal at 0.52. The ROC values for the models were the following: Model1 with 0.79, Model2

with 0.77, Model3 with 0.79, Model4 with 0.74, Model5 with 0.73, Model6 with 0.74 and Model7 with 0.67. Models using Mentor_Type were not selected because of missing data and having only 15 events which limited its use for models with more than one variable.

The best fitting model was Model3: Retention~CNET_TYP+Gen2+ CSUP_Mentor which had an OR of 0.79, reversed the estimate to 0.36 and had a p-value of 0.72 with 73 degrees of freedom.

In summary, there was not enough evidence to reject the claim of no effect of the influence of mentor network type (Traditional vs Other) on retention.

Research Question #3

Is the retention rate different for public health nurses who have been mentors compared to those who have not?

There was not enough evidence to reject the claim of no effect between serving as a mentor (Guide) and retention using unadjusted analysis (with an OR = 1.75 and p-value of 0.1). However, when variables were controlled, non-mentors had higher retention rates than mentors with an odds ratio of 2.7 and p-value = 0.037. This shows weak evidence to reject the claim of no effect between being a mentor and retention. See Table 10 below.

N=214	Bivariate	Multivariate Model 7
Control Variables	None	Generation2, Schedule
Area Under the Curve (ROC)	0.57	0.72
Odds Ratio	1.75	2.22
95% CI	[0.84, 3.83]	[1.07, 4.84]
P-value	0.1	0.037
Statistical Difference?	No	Yes

Table 10: Research Question 3: Retention and Being a Mentor Results

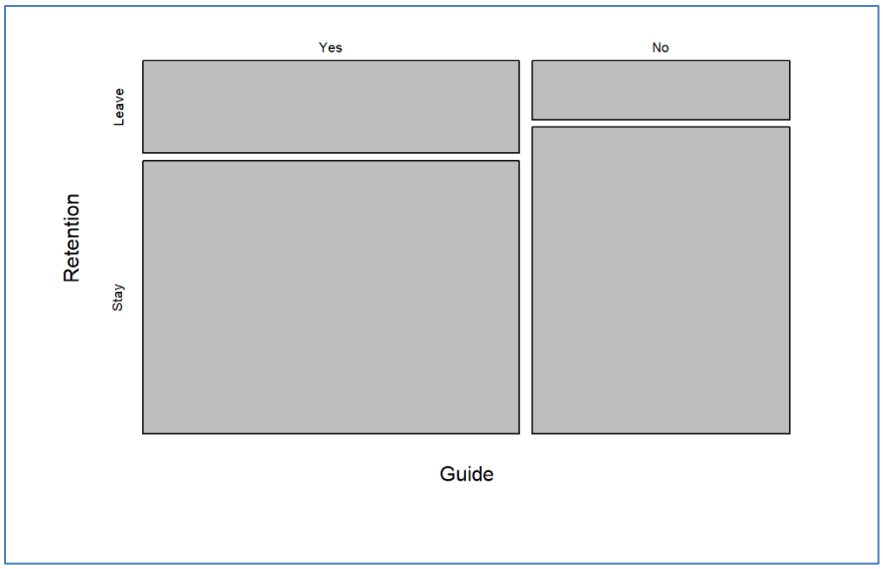
2x2 Table. Over half (59.3%) of current PHNs in the sample had been a mentor in the past year. PHNs who had not been mentors were more likely to intend to stay (84%) compared to those who had been mentors (75%) with a p-value = 0.1; odds ratio:1.75 with a 95%; CI [0.84, 3.83]. The unadjusted odd ratio indicates that the sample odds of staying for non-mentors was

1.75 times the corresponding odds for those who had served as mentors. See Table 11 and Figure 10.

Been a Mentor		
Retention	**Mentor**	**Non-mentor**
Leave	32/127 = 0.25	14/87 = 0.16
Stay	95/127 = 0.75	73/87 = 0.84

Table 11: Serving as Mentor and Retention Rate

Figure 10: Bar Chart of Retention and Being a Mentor



Several mentor factors affected retention rates. Like other Millennial PHNs, Millennial mentors were more likely to leave their employers than GenX/Boomer mentors with a p-value= 0.008; odds ratio = 3.9 with a CI [1.38 11.16]. Like other PHNs, mentors who had mentor-like supervisors were more likely to stay with their employers with a p-value= 0.009; odds ratio = 4.57 with a CI [1.75, 13.07].

Other mentor factors' unadjusted retention rates did not have p-values below 0.05. Mentors who worked fulltime were somewhat more likely to stay with their employer with a p-value = 0.2. Mentors with six or more years of employment had somewhat higher stay rates compared to the sample mentors with five or less years' employment with a p-value = 0.2. PHN mentors who worked in an agency with a formal mentorship program had a somewhat higher intent to stay than those who were mentors in an agency without a formal program, but this difference was not significant with a p-value = 0.5. Mentors who had mentors themselves had a higher rate of intention to stay compared to mentors without a mentor with a p-value = 0.5.

Controlling for Other Variables. Being a mentor was analyzed alone to see the effect on retention. Subsequently, covariates were added to the model to find a good fitting model. The simple model, Retention~Guide, had an odds ratio of 1.76, estimate of 1.58 and p-value of 0.11. This indicated that study participants who had not been mentors had 1.58 increased odds of staying at their employer compared to participants who had been mentors.

When looking at the influence of being a mentor on Retention, several dichotomous explanatory variables were considered. Gender, State, Race, Generation, Length of Employment and Employer were not selected for the model because of reasons described earlier in Q1. Variables tested to see if they impacted mentor's odds ratio or estimate were Eth, LOE2 (length of employment categories of 0-5 years and 6+ years), Generation2, Sponsored, CNET_TYP, Schedule, BIPOC, and Position, Mentor_Type, CSUP_Mentor and Mentor. There were five dichotomous variables selected: Generation2 (p-value = 0.99), CNET_TYP (p-value = 0.76), Schedule (p-value = 0.05), Mentor_Type (p-value = 0.2) and CSUP_Mentor (p-value = 0.0003). Models with CNET_TYP and Mentor_Type were subsequently not considered since they had missing data limiting their events to 15 making them unsuitable for models with more than one

variable included. One or both variables were included in models 1, 4, 5, 6, 8, 9, 10 and 11 so these models were excluded as final logistic regression model choices, leaving models 2,3,7 and 12 as acceptable options.

Two of the twelve models (Model7 and Model12) had p-values that were statistically significant. Model1: Retention~Guide +CNET_TYP+Mentor_Type had 74 degrees of freedom and a p-value of 0.58. Model2: Retention~Guide+Generation2+ CSUP_Mentor had 208 degrees of freedom and a p-value = 0.074. Model3: Retention~Guide+ Schedule+ CSUP_Mentor had 208 degrees of freedom and a p-value = 0.075. Model4: Retention~Guide+CNET_TYP + Mentor_Type+CSUP_Mentor had 73 degrees of freedom and a p-value= 0.64. Model5: Retention~ Guide+ Mentor_Type + CSUP_Mentor had 74 degrees of freedom and a p-value= 0.62. Model6: Retention~Guide + Generation2 + CNET_TYP had 73 degrees of freedom and a p-value=0.59. Model7: Retention~Guide+Generation2+Schedule had 208 degrees of freedom and a p-value= 0.037. Model8: Retention~Guide+ Generation2 + Mentor_Type had 73 degrees of freedom and a p-value= 0.6. Model9: Retention~Guide + CSUP_mentor + CNET_TYP had 74 degrees of freedom and p-value =0.58. Model10: Retention~Guide +Schedule+CNET_TYP had 73 degrees of freedom and a p-value= 0.39. Model11: Retention~Guide +Schedule+ Mentor_Type had 73 degrees of freedom and a p-value = 0.4. Model12: Retention~Guide+ Generation2+Schedule+CSUP_Mentor had 206 degrees of freedom and a p-value = 0.04.

The area under the curve ROC test for the simple model Retention~Guide was minimal at 0.57. The ROC values for the models were Model1 with 0.63, Model2 with 0.74, Model3 with 0.7, Model4 with 0.74, Model5 with 0.73, Model6 with 0.71, Model7 with 0.72, Model8 with 0.74, Model9 with 0.7, Model10 with 0.66, Model11 with 0.7 and Model12 with 0.76.

To find the best fitted model, considering sample size, with the lowest p-value, twelve

models were tested. The best model was Model7, Retention~Guide+Generation2+Schedule. The odds ratio changed from 1.76 to 2.22. The estimate for Guide changed from 1.58 to 2.09 with a p-value of 0.037 with 208 degrees of freedom. The area under the curve for Model7 increased from 0.57 to 0.72.

In summary, the unadjusted analysis and 2 of the 4 usable models (Model2 and Model3) did not show enough evidence to reject the claim of no effect of being a mentor on retention. However, after controlling for Generation2 and Schedule (Model7) and Model12 (Generation, Schedule and CSUP_Mentor), there is weak evidence to reject the claim of no effect of being a mentor on retention, with PHN mentors more likely to leave their agency.

Research Question #4

Is the retention rate different for public health nurses who have a mentor-like supervisor compared to those who do not?

In the unadjusted analysis, the retention rate was higher for PHNs in the study who had a mentor-like supervisor than for PHNs who did not have a mentor-like supervisor (OR = 3.7 and p-value = 0.0002). After adjusting for covariates, there was still evidence to reject the claim of no effect of mentor-like supervision and retention. See Table 12 below.

N=213	Bivariate	Multivariate Model 6
Control Variables	None	Generation2, Guide
Area Under the Curve (ROC)	0.66	0.74
Odds Ratio	3.7	3.1
95% CI	[1.72, 8.33]	[1.59, 6.67]
P-value	0.0002	0.002
Statistical Difference?	Yes	Yes

Table 12: Research Question 4: Retention and Having a Mentor-like Supervisor Results

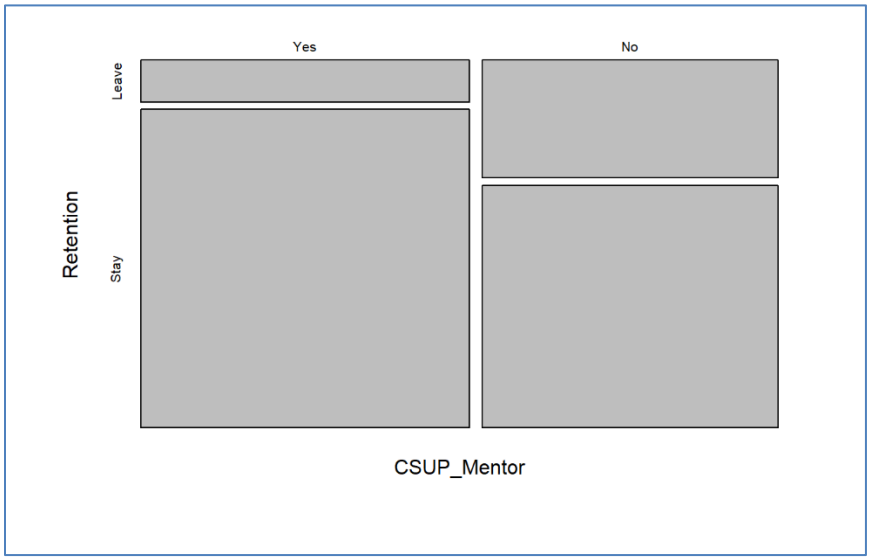
2x2 Table. Measuring whether PHNs perceived their supervisors to be like mentors was conducted through a single question developed by the student after defining the functions of mentors, “Do you consider your supervisor to be like a mentor to you?” and a series of questions

from the supervisor version of the MFQ-9 tool (Figure 2). PHNs who had a mentor-like supervisor had a higher intent to stay rate using both methods. Using the single question, PHNs who had a mentor-like supervisor were more likely to indicate stay intentions (88%) compared to those without (67%) with a p-value of 0.0002; odds ratio = 3.7 with a 95% CI [1.72, 8.33]. The odds ratio indicates that the sample odds of staying for those with a mentor-like supervisor was 3.7 times the corresponding odds for those without a mentor-like supervisor. See Table 13 and Figure 11 below.

Mentor-like Supervisor		
Retention	**Yes**	**No**
Leave	13/112 = 0.12	33/101 = 0.33
Stay	99/112 = 0.88	68/101 = 0.67

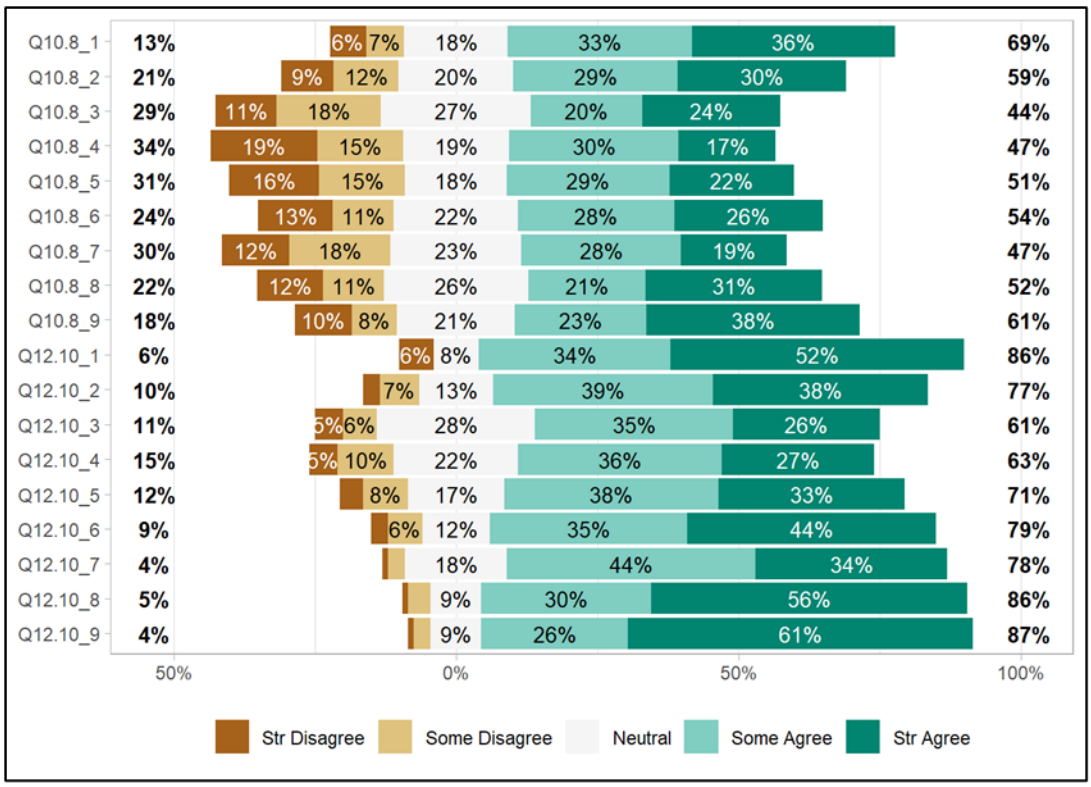
Table 13: Mentor-like Supervisor and Retention Rate

Figure 11: Bar Chart of Retention and Having a Mentor-like Supervisor



High scores on the MFQ-9 indicated that sample PHNs felt their supervisor was mentor-like. MFQ-9 questions were asked about both primary mentors and supervisors. MFQ-9 scores for primary mentors (Q10.8_1 to Q10.8_9) and current PHNs supervisors (Q12.8_1 to 12.8_9) are compared in Table 14. The full list of MFQ-9 questions is found in Figure 2 and Table 15.

Table 14: MFQ-9 Primary Mentor and Supervisor Answers.



Note: Questions 10.8 series pertain to primary mentors and questions 12.10 series refer to supervisors. Questions are explained in Table 15. Castro, S. & Scandura, T. (2004). Used with permission. Castro, S. L., & Scandura, T. A. (2004, November 3-6). The tale of two measures: Evaluation and comparison of Scandura's (1992) and Ragins and McFarlin's (1990) mentoring measures. Paper presented at the Southern Management Association Meeting, San Antonio, TX

When asked questions from the MFQ-9 assessment tool about the relationship with their supervisor and stay intentions, questions about interest, goals, time together, sharing confidences, friendship, modeling, motivating and teaching had p-values of 0.05 or less (See Table 15).

Table 15: Supervisor MFQ-9 and Retention P-Value Results.

MFQ-9 Question	P-Value
1) My supervisor takes a personal interest in my career.	0.0007
2) My supervisor helps me coordinate professional goals.	< 0.0001
3) My supervisor devotes special time and consideration to my career.	0.0007
4) I share personal problems with my supervisor.	0.5
5) I exchange confidences with my supervisor.	0.006
6) I consider my supervisor to be a friend.	0.001
7) I try to model my behavior after my supervisor.	0.001
8) I admire my supervisor's ability to motivate others.	0.0004

9) I respect my supervisor's ability to teach others.	0.02

Castro, S. & Scandura, T. (2004). Used with permission. Castro, S. L., & Scandura, T. A. (2004, November 3-6). The tale of two measures: Evaluation and comparison of Scandura's (1992) and Ragins and McFarlin's (1990) mentoring measures. Paper presented at the Southern Management Association Meeting, San Antonio, TX

Controlling for Other Variables. Having a mentor-like supervisor was analyzed alone to see the effect on retention. Subsequently, explanatory variables were added to the model to find a good fitting model. The model Retention~CSUP_Mentor had an odds ratio of 3.7, estimate of -3.6 and p-value of 0.00032. Several dichotomous explanatory variables were considered when looking at the influence of CSUP_Mentor on Retention. Gender, State, Race, Generation, Length of Employment and Employer were not selected for the model because of reasons described earlier in Q1. Variables tested to see if they impacted CSUP_Mentor's odds ratio or estimate were: Eth, LOE2, Generation2, Sponsored, CNET_TYP, Schedule, BIPOC, and Position, Mentor_Type, Guide and Mentor. There were six dichotomous variables selected: Generation2 (p-value = 0.99), CNET_TYP, (p-value = 0.88), Mentor_Type (p-value = 0.39), Eth (p-value = 0.19), Guide (p-value = 0.12) and Schedule (p-value = 0.12). Subsequently, models with either Mentor_Type or CNET_TYP were not selected as suitable models due to missing data which resulted in having only 15 events each. Thus, models 1 and 2 were not selected as final models.

To find the best fitted model, considering sample size, six models were tested. In Model1: Retention~ CSUP_Mentor+CNET_TYP + Generation2, the estimate changed from -3.6 to -1.92. The odds ratio was changed from 3.7 to 3.4 indicating favor of retention for PHNs who have a mentor-like supervisor with a model p-value of 0.05 for the CSUP_Mentor estimate with 73 degrees of freedom. In Model2: Retention~ CSUP_Mentor+ Mentor_Type+Generation2 the estimate changed from -3.6 to -1.68 with a p-value of 0.09. The odds ratio changed from 3.7 to

3.4 with 73 degrees of freedom. In Model3, Retention~CSUP_Mentor + Eth + Schedule the estimate stayed the same at -3.6 with a p-value of 0.0004. In Model4, Retention~CSUP_Mentor + Eth + Guide the estimate stayed the same at -3.6 with a p-value of 0.0003. In Model5 Retention~CSUP_Mentor + Schedule + Guide the estimate changed from -3.6 to -3.5 with a p-value of 0.0005. In Model6 Retention~ CSUP_Mentor +Guide + Generation2 the estimate -3.6 to -3.04 with a p-value of 0.002.

The areas under the curve when the ROC analysis was run was 0.66 for the simple model. ROC areas for the models were: Model1 (0.79), Model2 (0.81), Model3 (0.69), Model4 (0.7), Model5 (0.7) and Model6 (0.74). The best fitting model was Model6 with the OR and estimate staying similar and a p-value = 0.002.

In summary, adjusting for covariates had only a minor impact on the estimated OR and the relationship remained statistically significant between mentor-like supervisor and retention. The relationship between generation and retention is explored after the results of the research questions. There is evidence to reject the claim of no effect of having a mentor-like supervisor and retention, with those with mentor-like supervisors more likely to stay.

Research Question #5

Is the retention rate different for Black, Indigenous and People of Color (BIPOC) public health nurses who have racial or ethnic concordant mentors compared to those who do not?

BIPOC PHNs with a same race/ethnicity supervisor had a stay intention rate (70%) compared to those with a non-similar supervisor (80%), with a p-value = 1. There was not enough evidence to reject the claim of no effect of having a racially concordant mentor and retention for BIPOC PHNs with OR= 1.66 and p-value = 1. Adjusted results could not be

determined due to small sample size. See Table 16 below.

N=15	Bivariate	Multivariate
Control Variables	None	Sample size too small to determine
Odds Ratio	1.66	NA
95% CI	[0.09, 112.08]	NA
P-value	1	NA
Statistical Difference?	No	NA

Table 16: Research Question 5: Retention and BIPOC PHNs with Similar Mentor Results

Background analysis of BIPOC PHNs indicated Hispanic PHNs or PHNs who identified as a race other than "white" (BIPOC) had lower stay intentions (73.8% compared to 79.8%) compared to non-BIPOC PHNs with a p-value = 0.4.

Black PHNs (n= 33) in the study had similar stay intentions as white PHNs (80.8% vs, 79.2%). However, Hispanic PHNs (n= 9) in the study were less likely to indicate an intent to stay than non-Hispanic PHNs (66.7% vs 79.1%). BIPOC PHNs were somewhat more represented in the younger generations than older ones with a p-value = 0.5. BIPOC percentages of each generation: Gen Z was 33.33%, Millennial was 26%, Gen X was 18.9% and Boomer was 16%. There were no BIPOC nurses of the Silent generation.

In the study, BIPOC PHNs were slightly more likely to report having a mentor (40%) compared to non-BIPOC PHNs (38%) a p-value = 0.8. BIPOC PHNs with any mentor had similar intentions to stay compared to BIPOC PHNs without any mentor with a p-value = 1. While 40% of the BIPOC PHNs indicated that they had mentors (21 of 52 BIPOC PHNs), only 15 of 21 BIPOC nurses who had mentors completed the detailed mentor questions.

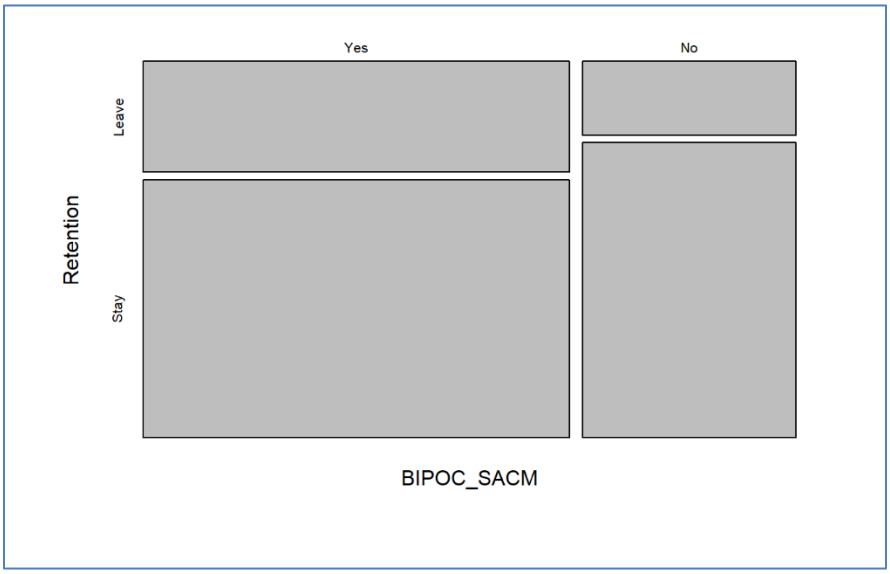
2x2 Table. BIPOC PHNs with a similar race/ethnicity mentor had lower stay intention rate (70%) than those with a non-similar mentor (80%) with a p-value = 1; odds ratio = 1.66 with a 95% CI [0.09, 112.08]. Of note was that the sample size for this research question was small

since only 15 BIPOC PHNs had completed all the mentor questions which contributed to a wide confidence interval for the odds ratio. Contributing to the difficulty to determine an answer for this research question was that none of the Hispanic PHNs with a mentor (n=4) had a Hispanic mentor. See the following 2x2 table (Table 17) and Figure 12 below.

BIPOC PHN with Similar Mentors		
Retention	**Yes**	**No**
Leave	3/10= 0.3	1/5=0.2
Stay	7/10=0.7	4/5=0.8

Table 17- BIPOC PHNs with Similar Mentors and Retention Rate

Figure 12: Bar Chart of BIPOC PHN Retention and Having a Similar Mentor



As seen with all sample PHNs in Research Question #4, BIPOC PHNs who had a mentor-like supervisor reported somewhat higher stay intentions (79%) compared to BIPOC PHNs without a mentor-like supervisor (67%). However, the p-value was 0.5.

Controlling for Other Variables. The small sample size prevented the running of logistic regression testing for this research question. In summary, research question #5 was difficult to answer because of a small sample size and missing data. There was not enough evidence to reject the claim of no effect of having a concordant mentor for BIPOC PHN retention.

Other Significant Quantitative Findings for Current PHNs

In addition to the research questions explored above, other variables in the study were examined to understand their relationship with PHN retention or other variables. Four variable relationships with p-values of 0.05 or less were discovered as follows: Generation2 and

Retention, Generation2 and having a mentor-like supervisor, having a mentor-like supervisor and a mentor, and having an employee sponsored mentor program and Mentor_Type.

Generation and Retention

PHNs from Gen X (47.57%), Boomer (30.34%) and Millennial (18.73%) groups were the most common current PHN respondents. Gen Z (2.25%), Silent (0.37%) and unknown (0.75%) generations had the fewest respondents. All (n=6) of the Gen Z PHNs indicated an intent to stay. Excluding the youngest and oldest generations that had the fewest respondents, Gen X respondents had the highest stay intention rate (84.3%) followed by Boomers (82%). Millennial respondents had the lowest stay intention rate (56.8%) with a p-value = 0.002.

When GenX and Boomer PHNs were combined because their retention indications were similar, and compared to Millennial PHNs, the higher leave intention of the Millennial PHNs in the sample was even clearer with a p-value = 0.0004; odds ratio = 3.85 with a 95% CI [1.75, 8.49]. See the 2x2 table for reference.

Generation		
Retention	**Millennial**	**GenX/Boomer**
Leave	19/44=0.43	27/165=0.16
Stay	25/44=0.57	138/165=0.84

Table 18- Generation and Retention Rate

Generation and Mentor-like Supervisor

When PHNs' mentor-like supervisor experience was analyzed by generation, Millennial PHNs reported having less experience with a mentor-like supervisor than their older or younger

peers. Slightly over a third (36%) of Millennial PHNs compared to over half (55%) older PHNs (GenX and Baby Boomer PHNs) reported have a mentor-like supervisor with a p-value of 0.03; odds ratio = 0.47 with a 95% CI [0.23, 0.95]. See the 2x2 table for details.

Generation		
Mentor-like Supervisor	**Millennial**	**GenX/Boomer**
Yes	17/47=0.36	107/196=0.55
No	30/47=0.64	89/196=0.45

Table 19- Mentor-like Supervisor and Generation

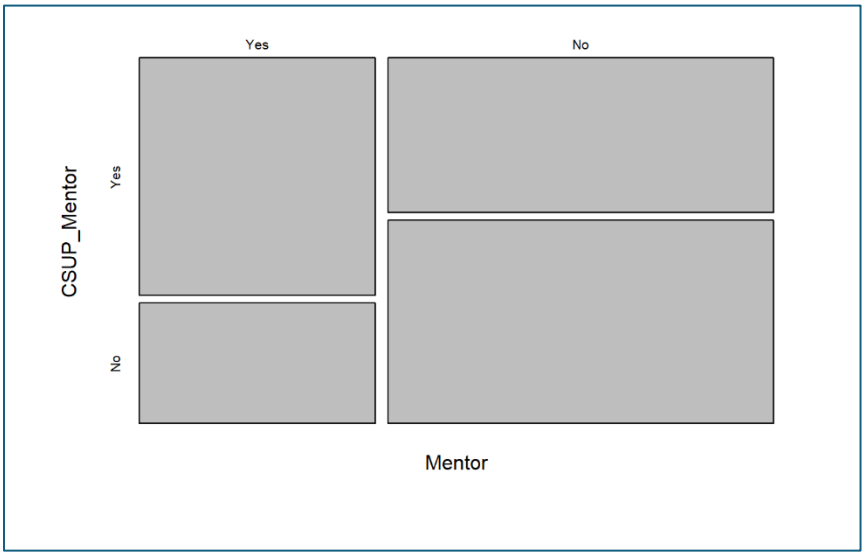
Having a Mentor-like Supervisor and a Mentor

Current PHNs who had mentors were more likely to also have mentor-like supervisors. Two thirds of PHNs who had mentors also had mentor-like supervisors. Over half of those without mentors also did not have mentor-like supervisors with a p-value of 0.0004; odds ratio = 2.58 with a 95% CI [1.47 4.57]. See the 2x2 table, (Table 20) and Figure 13 below.

Has a Mentor		
Mentor-like Supervisor	**Yes**	**No**
Yes	63/95=66%	67/155=43%
No	32/95=34%	88/155=56%

Table 20: Has a Mentor and a Mentor-like Supervisor

Figure 13: Bar Chart of Having a Mentor and a Mentor-like Supervisor



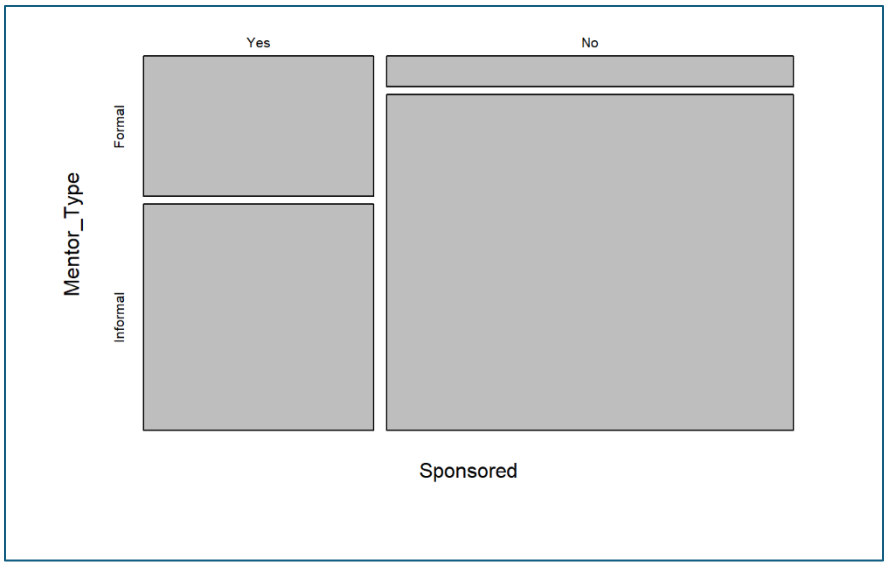
Employee Sponsored Mentor Program and Formal Mentorship

When assessing mentor type the PHN had experienced in their primary mentor relationship and whether an agency had a formal mentorship program, PHNs from an agency that had a formal program reported formal mentorship at a higher rate (38%) compared to if they worked in an agency without a formal program (8%) with a p-value of 0.0007.; odds ratio = 6.65 with a 95% CI [1.94, 26.89]. See Table 21 and Figure 14 below for reference.

	Mentor Type	
Sponsored Program	**Formal**	**Informal**
Yes	13/34=0.38	21/34=0.62
No	5/60=0.08	55/60=0.91

Table 21- Current PHNs' Mentor Type and Agency Sponsored Program

Figure 14: Bar Chart of Mentor Type and Sponsored Mentor Program



Other Quantitative Findings for Current PHNs

Other variable relationships were examined relative to retention or covariates. There were five relationships of interest that did not have p-values of 0.05 or less with bivariate testing, namely Employer and Retention, State and Retention, education level and Retention, employer-sponsored mentor program and Retention and generation and Mentor_Type.

Employer and Retention

Of the PHN work locations, PHNs working at community agencies, FQHCs and schools had the highest leave intentions (28%, 25%, and 24.24% respectively) while those working at state/federal, and universities had the highest rates of stay intentions (81.82% each). Since most of the participants worked at local health departments, a closer look at LHD retention was examined. Local health department PHNs in the study had a stay intention rate of 78.9%. This

rate was higher than those who worked at FQHC, community or school employers and lower than those who worked for state/federal agencies, universities or hospitals with a p-value = 0.4. When sample LHD PHNs were compared with all other PHNs (as a collapsed category), LHD PHNs' retention was almost the same as all other PHNs with a p-value = 1.

State of Residence and Retention

North Carolina was the state of residence for 89.1% of the respondents. PHNs from MN and OR represented 4.1% and 3.4% respectively. PHNs from other or unknown states represented 1.1% and 1.9% respectively. Of the current NC PHNs, 80.8% intended to stay in the next 12 months, which was somewhat higher than the other states' rates with a p-value = 0.06. However, since nearly nine tenths of the respondents were from one state (NC) in the sample, state differences should not be inferred.

Education Level and Retention

The most common nursing degree of respondents was BSN. Over 92% of the respondents had a nursing education of ADN (16.47%), BSN (53.56%) or master's degree (22.47%). When comparing the PHNs with the three most common degrees in the study, BSNs, master's and ADNs had similar rates of stay intentions (79.7%, 76.1% and 73% respectively). All the diploma nurses (n=5) and 87.5% of the nurses with doctoral degrees intended to stay with their employers. There was little difference in stay intentions in association with the education level with a p-value = 0.8.

Position (Supervisors/Consultants vs. Frontline PHNs) and Retention

Supervisors or consultants comprised 43.8% and frontline PHNs 55.4% of respondents.

PHN supervisors or consultants had a slightly higher rate of intent to stay (83%) compared to frontline PHNs (76%) with a p-value = 0.2.

Employer Sponsored Mentor Program and Retention

Survey participants reported that over one fifth of their employers (21.3%) sponsored a formal mentoring program while 71.2% of employers did not have a formal mentoring program at work and 6.7% of the PHNs did not know if their agency had a formal mentorship program. PHNs who worked at an agency with a formal mentorship program had a somewhat higher rate of intent to stay (83%) than those who worked at an agency without a formal program (78%) with a p-value of 0.5.

Generation and Mentor Type

PHNs of each generation in the study (except Silent) reported receiving both formal and informal mentorship. The rates of Millennial, Gen X and Boomer PHNs who had mentors were similar at 36%, 36.2% and 39.5% respectively. All six of the Gen Z respondents reported having mentors. Informal mentorship was the most common type of mentorship (82% of mentorships) for all age groups in the sample. When comparing mentor type and generation, Millennial PHNs had the lowest participation in formal mentorship (11%) compared to Gen X/Boomers who had formal mentorship percentages of 20% with a p-value = 0.5.

Other Quantitative Mentorship Findings for Former PHNs

Experience of Being a Mentor

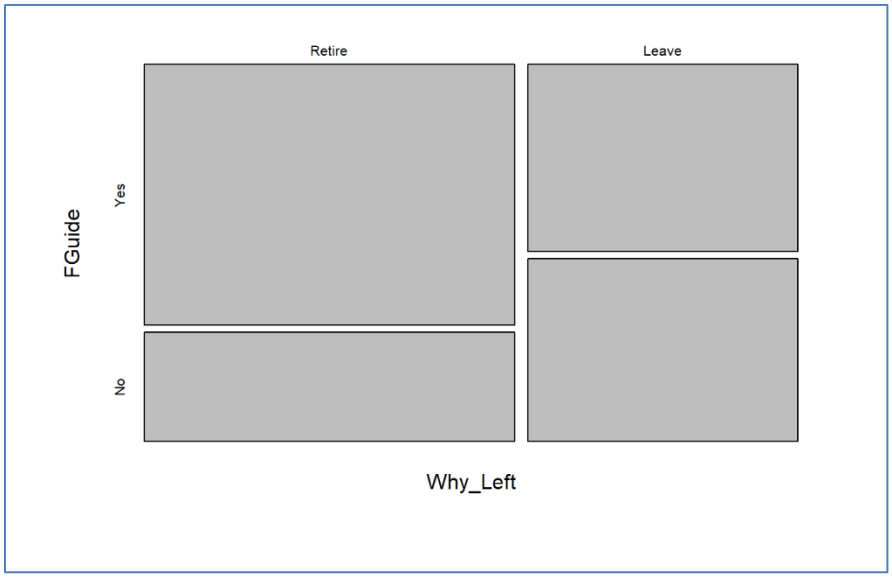
Former PHNs who retired and left voluntarily in the study were asked if they served as a mentor to a colleague during their final year in public health nursing. More retirees (70%)

compared to leavers (51%) had served as mentors with a p-value of 0.004; odds ratio = 2.33 with a 95% CI [1.27, 4.29]. See Table 22 table and Figure 15 for details.

Former PHNs Reason for Leaving		
Been a mentor	**Leavers**	**Retirees**
Yes	45/89=0.51	86/122=0.7
No	44/89=0.49	36/122=0.3

Table 22: Former PHNs and Served as a Mentor

Figure 15: Bar Chart of Former PHNs' Reason for Leaving and Having Been a Mentor



Experience with Mentors

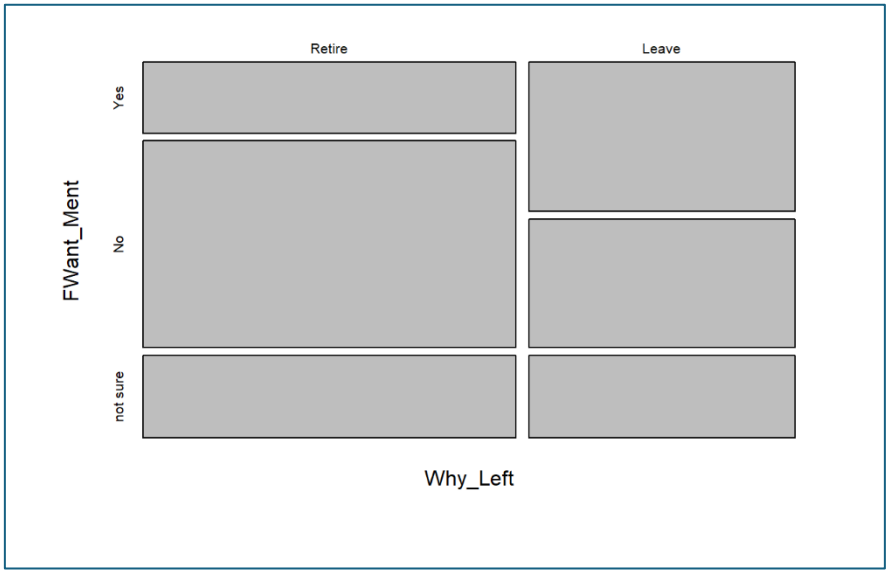
PHNs who had retired and those who had left voluntarily had similar rates of having a mentor their last year employed in public health, 18% for retirees and 20% for leavers with a p-value of 0.72. However, when former PHNs without a mentor were asked if they would have liked one, twice as many leavers (41.4%) compared to retirees (19.7%) would have liked a mentor and 23% were not sure if they would have liked a mentor with a p-value of 0.0014. See

Table 23 and Figure 16 for details.

Former PHNs Reason for Leaving		
Desired Mentor	**Leavers**	**Retirees**
Yes	36/87= 0.41	24/122= 0.20
No	31/87= 0.36	70/122=0.57
Not Sure	20/87= 0.23	28/122= 0.23

Table 23: Former PHNs and Desired a Mentor

Figure 16: Bar Chart of Former PHNs' Reason for Leaving and Desired a Mentor



The remaining mentor relationship variables did not differ significantly between former PHNs who retired or left voluntarily (leavers). Retirees and leavers had similar experiences regarding the strength of mentor relationships. Retirees rated their primary mentor relationship closeness to be less than close (13.6%), close (68.2%) and very close (18.2%). Leavers had slightly lower ratings with less than close (16.7%), close (66.7%), and very close (16.7%) ratings

with a p-value =1. Of the 40 former PHNs who had had a mentor in their last year of public health nursing employment, 27.5% had formal mentors. More retirees (32%) than leavers (22%) had formal mentors with a with a p-value of 0.7. Former PHNs who left voluntarily had a higher rate of Traditional mentor networks (78%) than retirees (59%) with a p-value = 0.3. Retirees reported a higher rate of employee-sponsored mentor programs at their last public health agency than leavers (25% vs 17%), with a p-value of 0.2.

Experience with Mentor-like Supervisors

The former PHNs who retired and left voluntarily were compared to see if there was a difference in having a mentor-like supervisor the last year of their public health employer. The rates were similar between the two groups, with 35% of retirees and 37% of leavers reporting mentor-like supervisors with a p-value of 0.88. Both rates were somewhat lower than those of current PHNs in the study (48.7%).

Qualitative Findings

Public health nurse participants were asked to share any thoughts at the end of the survey. Current PHNs were asked about their intent to leave, stay, or retire. Former PHNs were asked why they left the field of public health nursing, what requirements they had for returning or reasons they would not return to public health nursing. Qualitative responses were received from 51.7% of current and 60.6% of former PHNs. Exemplars were categorized in themes and subthemes.

Current Public Health Nurses

Planning to Leave. There were 46 current PHNs who indicated a plan to leave their agency in the coming year. They were invited to share about their intention to leave in an open-

ended format, “Please share any thoughts you have about leaving your employer.” Of the 46 nurses who indicated leaving intentions, 27 (59%) offered details about that decision. If a PHN gave more than one reason, each exemplar was placed in their respective sub-theme. The qualitative data were categorized into the themes of leadership and workplace environment. See Table 24 below.

Theme	Sub-Theme	Exemplars
Leadership	Lack of support (n=13)	“I have exceeded expectations in my role time and time again, yet I feel increasingly under appreciated.” (73)
	Loss of public health focus (n=3)	"Leadership is non-productive and no longer feels like “Public Health”. Moving towards business with no appreciation of staff." (59)
	Lack of clinical knowledge (n=3)	"I’m sad to leave my current job. I love the job but the leadership is terrible. The public health director of (my) County public health is not a nurse or social worker and is not qualified to be supervising professional staff. The new supervisor they hired has NO public health experience … I can’t stay in the unprofessional and unsupportive environment anymore. (167)
Workplace Environment	Unrealistic expectations, overwork (n=8)	"During that time, I have been expected to take on more and more responsibiliy [*sic*] to the point where safety for myself and my clients is now a concern. I am one of the only nurses at my agency and I lack the support, tools, and systems to do my job effectively." (73)
	Pay (n=6)	"I love public health. However, the salary does not compensate for the amount of work I am responsible for nor the after-hours of unpaid time I have to give." (146)
	Burnout and exhaustion (n=6)	"I used to feel excited and optimistic that what we do and what we teach people here made a real difference. Now, I feel cynical and ambivalent. I think that is my cue to find something else to do." (101)
	Bureaucracy and excessive paperwork (n=4)	"Corporate public health has become an exhausting list of metrics and boxes to tick off. These metrics and workflows are created by non clinical staff and are not intervention or patient focused. We cannot focus on providing actual care to our patients d/t the extensive minutia of non clinical tasks" (140)
	Lack of advancement opportunities (n=3)	“Advancing my degree to become a Psychiatric Mental Health NP. No opportunities for advancement in my current job. My employer does not value level of education/preparedness for nurses. They are focused on hiring and attracting the “cheapest” nurse possible. They are not invested in educational advancement of nurses.” (194)

Table: 24: Most Common Themes and Sub-Themes of Leaving PHNs (27 PHNs). Note: The number of exemplars is captured using “n”.

Leadership. The most verbalized dissatisfaction with agency leadership was the lack of support the PHN received. Thirteen PHNs wrote how they felt unsupported and undervalued by leaders in their agencies. One PHN wrote,

> During that time, I have been expected to take on more and more responsibility to the point where safety for myself and my clients is now a concern. I am one of the only nurses at my agency and I lack the support, tools, and systems to do my job effectively. (73)

Having leaders who were not clinically trained or knowledgeable about the public health clinical work concerned was mentioned by three PHNs. Three PHNs shared concerns about the perceived loss of public health mission being shared by leaders.

Work Environment. Outgoing PHNs expressed dissatisfaction with the work environment of their public health agencies. Eight PHNs explained that they were discouraged by unrealistic expectations, leading to overwork. This sub-theme included how PHNs were expected to accomplish the same amount of work with less time or resources due to vacancies and inexperienced staff. One current PHN planning to leave stated,

> I have little to no patient interaction because I am tied to my desk returning emails and updating policies, and I never feel like I get anything done because I am pulled in 1,000 directions to cover open nursing positions, callouts, or asked questions that no one else here has the knowledge to answer. (101)

Dissatisfaction with pay was another category that six PHNs planning to leave elaborated on. PHNs noted that inflation was outpacing their salaries and that they were not being compensated fairly for their work. One nurse stated, “Cost of living in (my area) has reached an all time high and wages do not match the cost of living (62)

Four current PHNs shared that their work had become tedious and consuming due to an increase in documentation, paperwork and processes. These tasks took them away from the

meaningful work of public health. The stress of excessive paperwork, overworking, poor leadership and unrealistic expectations contributed to burnout. Six PHNs expressed exhaustion and burnout with words such as “cynical”, “burnt out”, “excessive burnout”, and “pulled in 1,000 directions” One PHN shared, “Overwhelming workload and little to no support of nursing in the agency.” (144) Three PHNs expressed an interest in higher education or advanced training but were pessimistic about finding positions within their agency that rewarded their advancements.

Planning to Stay. Of the current PHNs in the survey, 63.3% (n=169) indicated they planned to stay at their public health agency in the next year. The PHNs were invited to share more about their plans with, “Please share any thoughts you have about staying with your employer.” Over half of those staying (53.8%, n=91) shared about their plans. The nurses shared thoughts in two categories: reasons to stay and barriers to retention. Both categories included themes of leadership and workplace environment. Retirement and work benefits were combined into a third theme for the stay category. If nurses’ data covered more than one theme or sub-theme, their exemplars were included in each applicable section. See Table 25a for details of themes and sub-themes of planning to stay.

Category	Theme	Sub-Theme	Exemplars
Stay Reasons	Benefits and Retirement	Stay until retirement (n=17)	"At this point, I am vested and want to stay here until I retire." (231)
		Current benefits/ salary/advancement (n=5)	"I enjoy my job and have really good benefits." (50).
	Workplace Environment	Enjoys PH Nursing (n=32)	"It's the best job I've ever had, though not perfect. I plan to stay as long as I live in the area" (143)
		Community Impact (n=8)	"I have been with the organization for almost 13 years and the impact we make on the community is greater than it has ever been." (187)
		Workplace relationships (n=7)	"I love my job and my co-workers! We are truly a team and a family." (263)
		Flexible schedule (n=6)	"I plan on staying with my employer mostly because of the schedule and flexibility." (19)
		Work life balance (n=4)	"They offer work-life balance-No weekends, no holidays, no "on-call", 40 hours/wk." (198)
	Leadership	Support (n=7)	"My school is very supportive of the school nurses." (183)
		Mentorship (n=6)	"Mentors are key to helping new nurses navigate their role as well as helping fellow nurses new to an organization. As my previous DON commented, "It takes at least a year to figure out where your spoke fits the wheel." My manager and DON mentored me and other nurses new to public health. They were key to the success of many a great nurse for public health." (96)

Table 25a: Most Common Stay Reason Exemplars of Staying PHNs (91 PHNs)

Stay Reasons. This group of nurses focused on retirement, pensions and other benefits. Seventeen PHNs relayed that one reason they were staying at their job was to earn a pension for retirement.

In terms of a positive work environment, PHNs who planned to stay had many positive thoughts about how much they loved public health nursing. Over a third of exemplars in this section talked about their love for their work and commitment to the mission of public health nursing. Their enjoyment of the work was fueled by the impact they felt they were having on their community and the good relationships they experienced at work with colleagues. One nurse shared, "I love the work that we do and I can see myself doing this for most if not all of my nursing career." (14) Good work life balance, including a flexible schedule, were other reasons the PHNs were planning to stay at their employers.

The staying PHNs were positive about support from leaders and how mentorship was something they had enjoyed at work. One nurse shared, “My employer is the best employer I have ever worked for. I feel like everyone there is a family. I feel cared about and supported.” (58) However, not all the exemplars were positive ones. Table 25b displays the barriers to retention that the staying nurses shared.

Category	Theme	Sub-Theme	Exemplars
Barriers to Retention	Workplace Environment	Low pay (n=9)	“We are not in public health for the money (obviously, starting grads start off minimum of $10k more than seasoned staff), but the ability to get closer in salaries would be amazing!” (158)
		Feeling stuck (n=6)	“I wish I had alternative options but feel compelled to stay with my current job for retirement, salary and retirement needs.” (22)
		Unrealistic expectations (n=3)	“There’s not enough time to do all the things needed. The staffing has somewhat stabilized since COVID, but now we’re having to retrain an entire workforce from the beginning. State and Federal funds are never enough to cover cost of providing services, plus mandates and requirements (that are not required in private sector) prohibit us from seeing more patients, which also decreases our ability to run a true business model.” (158)
	Leadership	Lack of support/value (n=7)	“It is the upper management that I have issues with. I am tired of hearing "I have an open door policy and want to hear your concerns"... when the actual response to multiple emails, voice mails and even attempts to see someone in person are overlooked. Calls and emails are never returned and I have quit looking for the "open door". Our local health department has had the most turn over in the past 4-5 years that I have seen since I went to work in PH in 1998. I don't see it getting any better.” (207)

Table 25b: Most Common Barriers to Retention Exemplars of Staying PHNs (91 PHNs)

Barriers to Retention. Although this group of nurses indicated a plan to stay with their employers, they also shared disincentives to retention. The most common workplace environmental barrier to retention was low pay. Nine nurses listed lower-than-average nursing salaries, unfair pay scales at work that rewarded new hires above seasoned employees and low salaries compared to other jobs in the community. Partly due to wanting to retire with a pension, six nurses felt trapped in their jobs. Three PHNs highlighted unrealistic expectations at work that made their work challenging.

Although most of the exemplars about leadership were positive from this group of PHNs, seven nurses made discussed lack of support from their leaders which contributed to their feeling unappreciated. One nurse shared, “Appreciation for employees (all of them-from custodial staff, management support, nursing and other areas) is truly a thing of the past.” (207)

Planning to Retire. Of the thirty current PHNs planning to retire in the next year, seventeen (57%) shared about their intent to retire. Retiring PHNs were asked if they would like to give more details about their plans with the invitation, “Please share any thoughts you have about retiring.” The data was categorized into three themes: personal/family time, anticipation and career reflections. See Table 26 below

Theme	Sub-Theme	Exemplars
Personal/Family Time	Work less (n=9)	“I am retired but have the opportunity to work at my public health agency part time and on call. I appreciate being able to work as a RN in this setting on a part time basis.” (185)
	Family time (n=4)	“I feel I have given my best years to others and now want some time for me and my family before I am to old to do the things I want.” (90)
Anticipation	Celebrating retirement (n=7)	“Can not wait to retire!!” (94)
	Early retirement (n=3)	“I just took a slightly early retirement due to more needed income & because job is physically exhausting. I will now work 1 day/wk instead of 2.” (46)
Career Reflections	Love being a PHN (n=3)	“I enjoy my job and my patients. I served my client's and also their mothers/fathers. I can't remember everyone of my client's names as there are just too many to count; but when out in my community citizens come up to me and hug me and address me as "Ms. Deborah" and that makes me realize that they have been my patients at some point. I am a teacher by nature and heart and that is what makes me love what I am doing for my community.” (249)
	Leadership (n=2)	“It would be beneficial to have a formal mentorship program at the Health Department. A lot of things are not written or consistent and it hard to train and mentor others. Many nurses with a wealth of experience are retiring and taking all the knowledge with them.” (83)

Table: 26: Most Common Exemplars of Soon Retiring PHNs (17 PHNs)

The PHNs in the study who are planning to retire soon were looking forward to it. Freedom to work less and enjoy doing what they wanted with their extra time was a common sentiment. Spending more time with family members was something they anticipated. Retirement was framed as a deserved and celebrated season. Three PHNs wrote about their

careers and reflected on what they enjoyed and accomplished.

Former Public Health Nurses

Public health nurses who were no longer working in the field were given the opportunity to share about their experiences of why they left, what might encourage them to return to public health or why they would not want to return to public health, if that was indicated.

Reasons Why Former Public Health Nurses Left the Field. The former PHNs were invited to share more about their decision to leave with, "Please share any thoughts about why you left public health nursing." Of the 259 former PHNs in the study, 149 (58%) shared why they decided to leave their public health nursing job. Exemplars from former PHNs about why they left were categorized in themes of retirement, leadership and workplace environment. See Table 29a (about retirement and leadership) and Table27b (about workplace environment) below for details on themes and sub-themes of former PHNs.

Theme	Sub-Theme	Exemplars
Retirement	Time to retire (n=21)	"Retired after 34 years of service, had met my personal goals for the job (315)
	Caregiving (n=8)	"I was caregiver for my parents who were in declining health" (443)
	Personal health (n=8)	"The physical expectations were too much for my abilities at that time before my joints replacement surgery." (283)
	Family time (n=4)	"I was ready to retire and spend more time with my family who lives out of state" (277)
	Work less (n=3)	"I retired the community health leadership role but stay in the organization in other nonclinical roles. I work remotely now a few hours weekly." (426)
Leadership	Lack of support (n=27)	"Other reasons were the extreme short staffing and turnover of the nurses on my team, and what I felt was a severe lack of support within the public health department." (450)
	Unprofessional (n=25)	"I would have but not with this poor leader, numerous, greater than 15 left this field due to her poor leadership skills…(455)
	Unfair treatment (n=16)	"I was discriminated against and false allegations were made against my license." (270)
	Favoritism (n=8)	"I retired but was tired of all the favoritism shown to employees who didn't do their job, were given positions they were not qualified to hold because they were friends of their immediate supervisor." (368)
	Non-clinical (n=5)	"My supervisor was not a nurse, this made the relationship challenging" (454)
	Unethical practices (n=5)	"The agency was sold by the county to a for profit buyer whose ethics were questionable at best." (392)
	Department consolidation (n=3)	"Changes in the agency (consolidation w/DSS) drastically changed the culture & work environment leading to poor morale." (433)

Table27a: Most Common Retirement and Leadership Exemplars of Former PHNs (149 Former PHNs)

Retirement. Almost half of the former PHNs (47%) left their public health agency because they retired. They highlighted that retirement was the time in their lives to enjoy after long careers in public health nursing. The rest of the retirement exemplars featured four ways they planned to spend their time: caregiving for family members, taking care of their own health needs, spending time with family and working part-time.

Leadership. Former PHNs participants shared many concerns about the leadership of their former employer. Feeling a lack of support from leaders was the most frequently expressed concern. Twenty-seven former PHNs who chose not to continue in a job where they felt unsupported and undervalued by those in charge wrote details about their concerns. Twenty-five nurses disliked that some leaders demonstrated unprofessional behaviors. PHNs communicated

their thoughts about leaders' favoritism, unfairness and prejudice making their lives difficult and their work more challenging. One nurse recalled, "The health department director at our county health department was very unfair and disrespectful to the nursing staff. She was rude and unprofessional. She was never supportive of any nurses." (481)

Five former PHNs reflected on perceived unethical decisions of their superiors. Five PHNs expressed dissatisfaction that their leaders did not have a clinical background and felt their nursing concerns were unheard. One PHN expressed her concerns about non-clinical leadership this way,

> After working through the pandemic, I experienced extreme frustration with the politics of my agency. There was no avenue to promote changes within the organization framework and I became very frustrated. Within the framework of my agency, I was the Lead Nurse and had very little understanding of my role from administration above and my supervisor (who was is not a healthcare professional) did not have the same understanding of my role as I did. (483)

Three former PHNs participants shared that their county leadership had decided to consolidate their local health department with other county agencies which had perceived poor results for public health. One of the results expressed was loss of control to make public health decisions. One nurse shared,

> I loved working in Public Health, up until the decision to consolidate occurred. With this decision, much went downhill... The Board of Commissioners did NOT understand the value or benefit of an autonomous Public Health Department and wanted to call all of the shots, even when the

direction they wanted to take was so obviously wrong, counter to the science, and/or a personal attack of the Public Health leader/representative… (494)

Table 27b displays work environment reasons that contributed to former PHNs leaving their agencies.

Theme	Sub-theme	Exemplars
Workplace Environment	Stressful workplace (n=26)	"Incivility was intolerable, mean girls club caused 7 resignations in lads than 6 months. It was an extremely toxic workplace." (362)
	Overwork/ unrealistic expectations (n=22)	"We were staffed at 50-60% capacity and booked at 110%+ capacity for over a year. It wasn't safe and after meeting with management repeatedly, none of the feedback from clinical staff was acknowledged and no changes were made. "(382)
	Pay (n-19)	"I think that pay is the biggest thing keeps nurses from being a public health nurse. The pay is way to low for such an important job." (435)
	Bureaucracy and paperwork (n=15)	"I was tired and emotionally drained by nursing and the overwhelming paperwork. The continued responsibility required without adequate support staff to accomplish required caseload needs." (379)
	Exhaustion / burnout (n=14)	"I had a classic case of burn-out doing home visiting for 21 years." (305)
	Covid pandemic (n=8)	"The Covid pandemic was extremely stressful for all of us in the office…The most difficult aspect was disruption of regular routine, polices, and protocols with limited guidance from other sources…" (289)
	High Turnover (n=8)	"Had no faith in the clinical competence of the leadership team; critical thinking skills were not valued by leadership; consistent high turnover rate of RNs was discouraging. (395)
	Lack of Advancement (n=8)	"I would have stayed longer if there was more room for advancement." (391)
	PH work not appreciated (n=6)	"Funds to support good public health programs not available." (432)
	Lack of mentoring (n=5)	"Lack of hands on support when I asked for help with a skill I had not performed in a long time. (440)
	Lack of work life balance (n=5)	"Too much time having to take call on weekends/nights/holidays."(440)
	Not challenging (n=4)	"I felt stagnant and was doing almost the same thing every day. I wanted to work in an environment that was more dynamic and where I could grow and learn new things." (430)

Table 27b: Most Common Workplace Environment Exemplars of Former PHNs (149 Former PHNs)

Work Environment. Former public health nurses shared that the workplace had become unpleasant. Camaraderie that was once present had been replaced by discord. Former PHNs complained of work situations that were stressful, unpleasant and political. One nurse summarized, "The Health Department where I worked had become a toxic workplace." (494)

Nurses relayed that their work felt like a heavy load to bear due to overwork, unrealistic expectations, excessive rules of bureaucracy and unnecessary paperwork. Four nurses relayed that they felt underutilized and left public health nursing to find more challenging roles that used more of their clinical skills.

Low salary was a common complaint from the former PHNs. Nurses were disappointed that they could not afford to work as a PHN and raise a family and had not received pay increases for several years. Pay inequity between experienced and new employees was a concern. Not making enough income to keep pace with family needs was expressed. One nurse wrote, "The pay was extremely low. For a single parent with two children and a 9 to 5 job, it was almost impossible to afford groceries, much less summer care." (280)

Former PHNs shared that work overload, working overtime, lack of support for the field of public health, lack of mentoring and workplace stress contributed to exhaustion, burnout, high turnover and poor health. Responding to the Covid pandemic, working more because of agency vacancies and having unrealistic demands placed on them at work were mentioned in relation to burnout. One respondent reflected,

> I originally planned to continue working for several more years, but I was burned out after two years of the COVID pandemic. Other reasons were the extreme short staffing and turnover of the nurses on my team, and what I felt was a severe lack of support within the public health department. (450)

Lack of advancement opportunities was a sub-theme that eight discontented former PHNs shared. They wanted to stay, but also wanted to grow in their careers, and did not see how to do both.

Former PHNs' Requirements to Return. When asked if a public health position was a possibility for the former PHNs, half of the former PHNs (n=131) stated that they were open or

unsure if they would return to public health. Of these possible returnees to public health nursing, 67 (51.1%) shared preconditions they had to return to public health nursing by responding to this invitation, "Please share any thoughts about what would bring you back to public health nursing." Although seven of these nurses indicated they were open to returning, they later wrote that they were not considering returning to public health at all. The exemplars of possible public health nursing returnees (n=60) were coded in themes of the workplace environment and leadership (see Table 28).

Theme	Sub-theme	Exemplars
Workplace Environment	Part-time (n=19)	"I think offering part time positions with scheduling flexibility is essential for working mothers!" (382)
	Pay/Benefits (n=10)	"I would definitely require a livable wage." (280)
	Flexible schedule (n=9)	"Interesting opportunities or duties that I would enjoy with a flexible schedule to work from home" (346)
	Right opportunity (n=8)	"…I would consider going back if I knew someone who was working somewhere amazing and supportive at an org doing great work and they convinced me to come there. I used to work in homeless shelters in (another city) and I'd love to do that kind of work again someday if a good opportunity arose." (423)
	Leadership position (n=4)	"Would return to an agency that recognized and valued my knowledge and expertise in public health…." (395)
	Less stress (n=4)	"Less Stress...For work loads to be more equitable." (428)
	Less bureaucracy (n=4)	"Better pay, work that felt more impactful and less like just checking boxes to satisfy state requirements." (356)
	Close to home (n=4)	"If a position came open with the local PH dept" (291)
Leadership	Support (n=11)	"So I love the work itself, but I would want to be much more careful about prioritizing myself and my mental health a little higher. A job would have to be beneficial to me enough to outweigh any difficult times. In other words, salary alone does not make my decisions. I will always see a supportive, collaborative work environment where learning and growth are encouraged." (289)
	Leadership change (n=4)	"I would not return there with current administrative staff." (49)
	Fair treatment (n=3)	"Somewhere I could trust to be treated and supported better." (419)

Table 28: Most Common Return Requirement Exemplars of Former PHNs (60 Former PHNs)

Workplace Environment. The return requirements of the former PHNs included job logistics factors such as number of hours, location of the work, work schedule and proximity to their home. A desire for part-time work was the most common requirement. Both retired PHNs and those who had young children at home expressed a desire to work less than 40 hours per

week. Nurses lamented that part-time public health nursing positions were hard to find, “I would have stayed if there were part time positions but there were none. ..I loved my job! I would return immediately if there was a part time position.” (391)

Ten former PHNs who were retired or had moved to better paying nursing positions outside of public health would not consider returning to public health nursing unless the wage was worth it to them. Four nurses added that a leadership position would also be a requirement for them to return.

Finding a public health position with less stress, less paperwork and more focus on clients was important to former PHNs. One former PHN shared.

> I love public health nursing but the fact is that it's more taxing than many other outpatient roles ...I'm at stage in my career and life where I don't want to put that much emotional energy into my work. I was dedicated public health RN for over 10 years and that may have been enough. (423)

Eight respondents mentioned that for the right opportunity, they would return to public health nursing. The details of their ideal position included job specifics, role details, work environment and compensation.

Leadership. **S**upport from leadership was a common condition to return to public health work, mentioned by eleven former PHNs. Former experienced and retired PHNs reflected that having support and feeling appreciated at work was crucial to them. One nurse shared, “Would return to an agency that recognized and valued my knowledge and expertise in public health (experience as a nurse manager, state consultant, and subject matter expert at the state level).” (395)

Three former PHNs stated that they would consider returning to public health if they

thought they would be fairly treated. Choosing an agency that gives nurses a voice, works collaboratively and listens to frontline staff would be a priority for them. One nurse shared, "Also, more clinical staff need to be invited to decision making tables." (382)

Reasons Former PHNs Will Not Return. Former public health nurses who indicated they were not open to returning to a public health position were allowed to share their thoughts with an open-ended text box, "Please share any thoughts about not returning to public health nursing." Of the 110 former PHNs who did not plan to return to public health nursing, 30% (n=33) shared their reasoning. The most common exemplars related to retirement, workplace environment and leadership concerns. See Table 29 below for details.

Theme	Sub-theme	Exemplars
Retirement	Age/health (n=13)	"I'm not gainfully employed, but I'm having a ball doing volunteer work which utilizes the skills I learned in Public Health.". (370)
Workplace Environment	Stress (n=7)	"I absolutely loved my job in school nursing in so many ways and for the many years I worked in that position.. But as time went on, it became more stressful with the annual increase in responsibilities, especially too as I aged. The stress outweighed my love for the job." (410)
	Low Pay (n=3)	"As an ERRN, with many years experience, new hires were making more than I was with less responsibility." (350)
Leadership	Lack of support (n=7)	"Supervisors did not do much related to supporting new or seasoned PHNs." (429)
	Unprofessional (n=6)	"I was a PHN for many years and mostly enjoyed it. My last job and supervisor ruined it for me…Leadership at HD knew how bad this supervisor was and they did nothing about it." (414)

Table 29: Most Common Not Returning Exemplars of Former PHNs (33 Former PHNs)

Retirement. Thirteen of the former PHNs' exemplars related that they were at an age and stage of life that they were not interested in working anymore. Retirement suited them and they expressed contentment about not working or noted that they were caregiving for family members, which prevented having paid employment.

Workplace Environment. Not wanting to return to a stressful work situation was a common sentiment with seven PHNs who did not plan to return to public health nursing. Three former PHNs cited low pay as a reason they would not consider returning to public health.

Leadership. Leaders' lack of support for staff and understanding of their day-to-day work were shared by seven former PHNs. Experience with leaders who exhibited poor leadership skills or insensitive styles were also reasons former PHNs decided to stay away from future public health positions.

Chapter 5: Discussion, Implications, Summary and Conclusion

Discussion and Interpretation of Findings

Both current and former PHNs expressed high regard for public health nursing work. Many nurses reported satisfaction with their chosen careers and were planning to stay in their positions. Even discouraged PHNs often mixed their negative experiences with praise about the work itself. This mix of positive and negative work experiences led to ambivalence for some current and former PHNs when describing their intent or decisions to leave the field as the fulfillment of the job outweighed the dissatisfying factors. But for others, the push to leave was too great, resulting in attrition mixed with regrets about what they missed about the job. The intent to leave rate for this study was 17% in the next 12 months. Other studies, including Charlie (2017), also asked PHNs about leave intentions in the next 12 months with 13% indicating that was their plan, Watts-Isley asked PHNs about leave intentions in the next three years and 33% of the nurses indicated this projection. This chapter will discuss and interpret the study's findings related to PHN retention, make recommendations to improve the retention of public health nurses, acknowledge strengths and limitations of the study, and note areas that merit further research.

Retention and Mentorship

The research questions focused on PHNs' relationships with mentors and how mentorship may impact PHN retention. Each of the research questions' results and any implications are discussed in turn.

Research Q #1: Formal Mentorship. Research Question #1 results showed that although PHNs with formal mentor programs had higher retention rates than those with informal mentors (93% vs. 78%) with an odds ratio of 4 for the sample PHNs, the confidence interval was wide, and the p-value was not statistically significant. The number of events was small, especially for those who experienced formal mentorship, and may have affected the results. Distinguishing between formal and informal mentorship in future studies with a larger sample size is recommended to determine any PHN retention difference between formal and informal mentorship.

Reflecting a desire for mentorship, 44% of former PHNs would have liked a mentor. Nearly three quarters of the PHNs in the study did not have formal mentorship programs available to them at their agency and this was the top reason mentioned for not having a mentor by those who wanted one. In this study, 35% of current PHNs had neither a mentor nor a mentor-like supervisor. Providing formal mentoring options within the agency may allow PHNs to find a mentor for support if desired. Only 28% of the PHNs in this study with formal mentorship experience indicated the mentorship originated outside their employers. In-agency mentoring programs offered PHNs better access to formal mentorship.

A retention benefit from formal over informal mentorship was found in research by Newman (2017) when they compared their nurse residency participants' retention rate with nurses who had other types of mentors. In a review of studies, new graduate nurses who worked in hospital settings had higher retention rates if they received agency-sponsored mentoring (Vidal & Olley, 2021). However, several early mentor researchers found more benefits from informal mentorships for mentees (Chao et al., 1992; Ragins & Cotton, 1999; and Scandura & Pellegrini, 2010). One of the persisting gaps in mentorship research is that some researchers have

not distinguished whether the mentorship under discussion was formal or informal in origin (Wanberg et al., 2003). Perhaps one reason that formal mentorship showed more promise for retention in this study is that formal mentor programs have advanced in quality since the early years of mentor research. Wanberg et al. (2003) noted that employers began designing formal mentor programs several decades ago so that the results gained would be as good as informal mentorships. As formal mentor programs increase in popularity and quality in public health organizations, perhaps improved retention will be one of the positive outcomes.

Research Q#2: Mentor Network Type. Research Question #2 assessed whether mentor network type would influence retention for PHNs. Mentor researchers, Higgins & Kram (2001) proposed that employees who have a strong, internal mentor network would be more likely to remain with their employer. The analysis of current PHNs in this study did not show an influence of mentor network type on retention intention. Only non-supervisory mentors were included in the mentor network analysis. Supervisors and their mentoring influence were measured in Research Question # 4. Perhaps if supervisory mentors were included in the networks, there would have been more evidence to reject the claim of no effect between mentor network type and retention.

Research Q#3: Being a Mentor. Research Question #3 investigated whether serving as a mentor had influence on retention. Although the unadjusted results and two adjusted models for mentors and retention had p-values of more than 0.05, mentors in the study had a lower retention rate than non-mentors when adjusted for generation and work schedule. This was an unexpected finding. Rowan et al., (2024) had found that being a mentor contributed to nurse retention in their study of hospital nurses. However. finding that being a mentor may increase the risk for mentor attrition supports the caution of Hermansson et al. (2024) who discussed that

nurse mentors may leave their positions if there is role ambiguity, insufficient training, understaffing or mentor isolation.

Mentors in the study who were part-time or did not have a mentor themselves had somewhat higher attrition rates. However, PHN mentors who had mentor-like supervisors or were of the GenX or Boomer generations had statistically significant lower leave rates than those who were not. Perhaps mentors earlier in their careers found mentoring to be burdensome and the role added to their job stress. Or perhaps some PHNs became mentors because they had already decided to leave their agency and wanted to pass on their professional knowledge before they moved on. Part-time PHNs may have found being a mentor too much added stress for the limited hours they have in their workweek.

Possible explanations for PHN mentor attrition risk in this study are that mentors experienced a lack of structure and support for their role or that the mentoring led to overwork which contributed to wanting to leave their positions as described by hospital nurse mentors in a qualitative study (Hermansson et al., 2024). In another study, nurse mentors who felt primarily responsible for their mentees' learning, rather than seeing their role as facilitating mentee learning, had an increased stress level that contributed to wanting to leave their positions (Smith & Cantillon, 2024). One study advised that nurse mentors need co-mentor support and reserved time in their calendars to improve their experience as mentors (Lysfjord & Skarstein, 2024).

Having a mentor or mentor-like supervisor while being a mentor may provide extra support for PHN mentors. Public health agencies may prevent unintended nurse mentor attrition by developing well-planned and structured mentoring programs that support mentors, set aside sufficient time and opportunities for mentor-mentee engagement and mentor-mentor interaction. Choosing nurses to be mentors who have been with the agency for at least six years, work full-

time, and have their own mentor or a mentor-like supervisor may reduce mentors' attrition risk. More research is needed to understand what mentors need to support them in their role and why being a mentor may be a risk for attrition.

Research Q#4: Mentor-like Supervisors. Research Question #4 found that PHNs who had mentor-like supervisors may have improved retention. When supervisors were identified as mentors for the PHNs using either the single question or the MFQ-9 tool, there was evidence to reject the claim of no effect of mentor-like supervision on retention.

This finding was not surprising as other studies have found that supervision style is influential for nurses' satisfaction when working in other settings. Research from O'Hara et al. (2019) found that supportive leadership was the biggest factor contributing to job satisfaction in a hospital study of Millennial nurses. When supervisors acted in supportive, mentoring ways for Millennial psychiatric nurses, retention was improved in a study by Perkins et al. (2023). A supportive and participatory leadership style was found to be one of the most important factors for nurse retention in a review of studies regarding nurse turnover (Nei et al., 2015). In the 2021 PH WINS survey, over half of the public health employees indicated that satisfaction with their supervisor was one of the main reasons they stayed with their employer (Leider et al., 2023a). Crossen and Hunter Revell (2024) found that mid-career nurses valued supportive supervisors who showed them appreciation. A qualitative study of Millennial nurse retention by Bibbins (2021) identified supportive leadership as one of the main reasons why Millennial nurses stayed with their employers. Collaborative leadership styles like servant leadership and coaching were found to be positively received by Millennial nurses (Faller & Gogek, 2019).

PHNs in the study responded positively to mentor-like supervisors who offered role modeling, psychosocial support and career coaching. Training supervisors to be mentor-like in

their style may encourage PHNs to stay with their employers. Putting the results of this research question and results of the cited studies into public health practice could help agencies with PHN retention.

Research Q#5: Retention Influence of Similar Mentors for Black, Indigenous and People of Color (BIPOC) PHNs. The sample size with missing data for Hispanic and non-white PHNs was too small to determine if mentors of the same ethnicity or race might influence retention. The sample's lack of diversity reflects the same situation in the NC PHN workforce. The NC Institute for Public Health identified that the public health workforce in NC was 2% Hispanic and 9% non-white (NCIPH, 2020). Although the number of Hispanic and non-white PHNs was small in this study, an encouraging trend was noted in that the percentage of BIPOC PHNs in this study was higher in the younger generations. BIPOC nurses comprised 26.8% when the Millennial and Gen Z PHN sample groups were combined. Unfortunately, because the sample size was small, information about what influences retention of BIPOC PHNs was undeterminable. More research is needed to discover factors that encourage retention of BIPOC PHNs so there is greater diversity in the PHN workforce that more closely mirrors communities' demographics.

Aside from the five research questions, there were other findings worth noting from both the current and former PHN data analysis.

Retention of Millennial Public Health Nurses

Retaining Millennial public health nurses' merits attention for public health leaders. In this study, Millennial public health nurses had a lower intent to stay rate (p-value = 0.0004) than GenX and Boomer PHNs. When Millennial PHNs had a mentor-like supervisor, they had a higher intent to stay than those who did not have a mentor-like supervisor. However, Millennial

PHNs rated supervisors as mentor-like at a lower rate than by GenX and Boomer PHNs. Supervisors missed the sweet spot of mentor-like supervision with Millennial PHNs in the study. Supervisors of Millennial PHNs may need additional coaching to better connect with the Millennial nurses on their teams so that more Millennial PHNs perceive their supervisors as supportive to them.

Millennial nurses' shorter employment stays are supported by previous studies (Ulep, 2018; O'Hara et al., 2019; and Keith et al., 2021). Having a mentor-like supervisor may be a tangible way to encourage the retention of Millennial nurses. Supervisory behavior can influence Millennial nurse retention, as heard from nurse participants in focus groups led by Waltz et al (2020). Lack of advancement opportunities at work and low pay were attrition themes that were mentioned by current and former Millennial public health nurses in this study. Having advancement opportunity was a key retention factor for Millennial nurses found by Keith et al (2021). Galuska et al., (2023) found that cross-training and role enrichment were attractive retention strategies for Millennial nurses.

Retention and Workplace Environment

Both current and former PHNs shared commonalities regarding staying, leaving and retiring. The common work environment retention concerns identified by the survey PHNs of job stress, low pay, pay inequity, and lack of advancement opportunities are discussed in the following sections.

Stress of the Job. A stressful workplace environment was described in the qualitative sections of this survey, especially by former PHNs and those planning to leave within a year. Vacancies, overwork, unrealistic expectations, excessive paperwork, insufficient time to chart, expectations to see clients in short visits, and incivility of colleagues contributed to stressful

workplaces. Even though the Covid-19 pandemic response had subsided since the mass vaccination efforts of public health nurses in the early years of the pandemic, stress of the Covid-19 pandemic response still contributed to a stressful workplace for 8% of former PHNs and 16% of PHNs planning to leave. The finding that job stress contributed to PHN attrition agreed with recent nurse retention studies. The Covid-19 pandemic response contributed to public health nurse burnout and intent to leave in a qualitative study by Gwon et al (2023). The contribution of work overload and work stress on public health nurse attrition was found by Watts-Isley et al. (2022). Friese et al. (2024) identified that overwork and increased job stress contributed to attrition for hospital nurses in Michigan.

Dissatisfaction with Pay. Discontentment with pay was brought up by current and former PHNs when asked why they were planning to leave or why they had left their public health agency. For current PHNs who were planning to leave, low salary was the third most common reason given for leaving with 53% of PHNs listing it. Low pay was the second most common reason why former PHNs had left their employers and a top reason some PHNs did not plan to return to public health nursing, second only to retirement plans. Even PHNs who were planning to stay mentioned low salary as a dissatisfier in the qualitative questions. Many current and former PHNs discussed the low pay that they were currently receiving or had received in their former role. The pay was described as uncompetitive in the general nursing market, less than deserved, not enough for a livable wage and unfairly elevated for new hires.

That public health nurses in this study were dissatisfied with pay agreed with the 2021 PH WINS survey that found low pay was the top reason public health employees under 35 years old planned to leave their employer (Leider et al., 2023a). For Canadian PHNs in a study by Henderson et al (2004), low pay was a main driver of PHN attrition. Watts-Isley et al (2022)

found that 43.1% of frontline NC PHNs were unhappy with their pay. For public hospital nurses, pay was a leading reason for higher intent to leave rates for Millennial nurses (Mancuso, 2020).

Internal Inequity of Pay. Apart from the level of pay the PHNs received, internal inequity of salary was mentioned as a concern in the open-ended questions. Both current and former PHNs with experience complained that new hires were offered higher salaries and bonuses than they were receiving after working years for the organization. They did not see fairness in this arrangement and felt undervalued because of it.

Lack of Advancement Opportunities. The inability to grow and be promoted within their public health organizations was shared in the qualitative sections of the survey by both current and former PHNs. PHNs who had pursued higher education could not always find new positions within their agency that utilized their new skills. PHNs who felt stagnant and uninspired to stay in the same PHN role desired a change. This attrition contributor was confirmed in the 2021 PH WINS survey of public health employees which found that lack of advancement opportunities was second on the list of reasons public health workers planned to leave voluntarily (de Beaumont, 2023). In their review of studies of Millennial nurses' job satisfaction, Keith et al. (2021) related that Millennial nurses seek specialized education more than previous generations and look for advancement opportunities within their workplace. Not finding opportunities to grow in their career at their workplace can contribute to nurses' attrition (Keith et al., 2021). Lack of advancement and growth opportunities at work were identified by Watts-Isley et al. (2022) as attrition contributors with public health nurses.

Retention and the Role of Public Health Leadership

Public health nurses' experience with the leaders of their agencies influenced their intentions to stay or leave their public health nursing positions. Both current and former PHNs

shared perspectives on how their experiences with agency leadership, both positive and negative, affected their intent to stay or leave their workplaces.

Supportive Leaders and Supervisors. Supportive agency leadership was mentioned as a reason that public health nurses in the study planned to stay in their public health nursing roles. Nurses appreciated leaders who listened to them, valued them and understood the challenges of their work. Having a mentor-like supervisor provided a retention influence for PHNs in this study. Using the MFQ-9 assessment to measure supervisory relationships, PHNs who reported having supervisors who took a personal interest in their careers, helped them with professional goals and devoted time to their professional growth had a higher intention to stay rate. PHNs who reported having a supervisor for whom they had respect and admiration, wanted to model their supervisors' professional behaviors of teaching and motivation of others or considered their supervisors as confidantes or friends were more likely to intend to stay with their agency.

The importance of having supportive agency leadership for nurse retention has been found in other studies. Supportive leadership was key for Millennial nurses' job satisfaction in a hospital nurse study by O'Hara et al., (2019). In the 2021 PH WINS public health employee survey, 18% of public health employees cited satisfaction with their agency leadership as a reason they were planning to stay with their employer (Leider et al, 2023a; de Beaumont, 2023). In a survey of Millennial nurses by AMN Healthcare, mid-career nurses expressed a desire to be supported by their leaders (AMN Healthcare, 2018). Reflecting on that survey, Faller & Gogek (2019) recommended nurse leaders use a servant leadership style or a coaching approach with Millennial nurses to engage and collaborate with them. Diosdado (2023) found that Millennial nurses' intent to stay was strengthened by strong relationships in the workplace. In the scoping review of McClain et al. (2022), the characteristics and strategies of nurse leaders that

contributed to nurse retention included being dependable, supportive, communicative, fair, and available to nurses that they supervised. Providing supervision with role modeling was a leadership strategy that was highlighted in these studies (McClain et al., 2022).

Poor Leadership and Lack of Support. Conversely, perceived poor leadership was a main dissatisfier and reason participant PHNs gave for leaving or planning to leave in this study. Both current and former PHNs, those staying and leaving, noted poor leadership as a retention barrier and complained about suboptimal public health agency leadership in the open-ended questions. The shortcomings of leadership, namely, lack of support, favoritism, unfair treatment, and disconnection with staff realities were pointed out by the participants. Only the PHNs on the brink of retirement expressed little dissatisfaction with leadership. Complaints of leadership as a key driver of public health nurse attrition manifested in the 2021 PH WINS study as dissatisfaction with organizational culture (37%) and leadership change (16%) (de Beaumont, 2023). When summarizing the attrition influence of leaders on Millennial nurses, McClain et al (2022) found that leaders who were perceived as rigid, distant, inconsistent and poor communicators contributed to nurses' attrition.

Lack of support, a leadership issue, stood out as a main complaint in this study. Both current and former public health nurses reported they felt undervalued and unsupported by leadership, their supervisors, or their agency. Both current and former PHNs confided that, in some cases, leaders without clinical backgrounds were perceived to provide less support to PHNs than previous leaders who were nurses or physicians. In the two most recent PH WINS surveys, complaints about both lack of support and lack of recognition became more common from the 2017 to the 2021 surveys of public health workers and were reasons cited for planning to leave (de Beaumont, 2023).

Public Health Nurse Burnout and Attrition

Burnout was a common reason current and former PHNs reported for leaving their public health employers in this study. For current PHNs, burnout was the most common reason for wanting to leave (58%) and former PHNs listed burnout as the fifth most common reason for having left voluntarily at 30%. Burnout and exhaustion were mentioned in context of both leadership complaints and workplace overwork and stress. For affected nurses, burnout was expressed as both pushing them out the door of the public health nursing position and preventing them from wanting to return. This finding aligns with a review of studies of Millennial nurses that found burnout was a common factor leading to nurse attrition (McClain et al., 2022). The psychological stress of burnout and exhaustion can contribute to Millennial nurses' desire to seek other opportunities and leave their employers (O'Hara et al., 2019). In the PH WINS studies of 2017 and 2021, work overload and burnout increased from 23.1% to 43.1% as a reason why public health workers cited for planning to leave their employers (de Beaumont, 2023).

Retention of PHNs Nearing Retirement and Re-Recruitment of Retired PHNs

Viewed as an end-of-career goal and a well-deserved reward, retirement was brought up both by current and former PHNs. Nurses nearing retirement within the next year were the most animated about retirement. For some still years away from retirement, the goal of reaching retirement with a pension was acknowledged as a primary reason to stay with their public health agency. One strategy to maintain a well-educated and fully staffed public health nurse workforce is to retain near retirement nurses or re-recruit retired public health nurses. In this study, only 10% of the retiring nurses indicated that they would not delay or consider returning to public health work under any circumstances, which leaves 90% who would be open to the idea of continuing to work under certain conditions. This agrees with the findings of the 2021 PH WINS

survey which found that only 15% of public health workers planning to retire in the next five years planned to leave the workforce entirely. Retirement for PHNs receiving a pension allows some flexibility when they will retire and if they want to work part-time in retirement (de Beaumont, 2023). Sheppard et al, (2022) found that retiring nurses value good relationships with their agencies. Exploring opportunities to encourage delayed retirement or return to work after retirement could be strategies to reduce intellectual drain and retain key public health nurses. Retaining retiring nurses is a viable strategy for the nursing workforce to explore (Foster, 2019).

Retiring PHNs are Interested in Staying on The Team (Part-Time). Over half of both former PHNs and current PHNs planning retirement in this study indicated that they would consider returning to a public health nursing position or staying with their current employer if a part-time position was available. Offering more part-time employment to PHNs may be a strategy to retain near retirement PHNs and re-recruit retired and former PHNs back into the workforce. The Southend University NHS retire and return strategy included options for nurses to work part-time (Southend University Hospital, 2019). Part-time employment was a key reason experienced nurses would agree to delay early retirement in a survey of hospital nurses aged 50 and older (Myer & Amendolair, 2014).

Flexible Work Desired. Soon retiring and retired PHNs in this study also pointed to flexible schedule alternatives as a retention or returning influence for them. In this study, a flexible work schedule that included a work-from-home option was an incentive for continuing to work for 40% of retiring PHNs and 54% of those who had already left the field. Myer & Amendolair (2014) also discovered that a flexible work schedule, including a choice of workdays and hours, was important to older nurses.

Strengths of the Study

Mentorship Relationship Detail

This study asked detailed questions about PHNs' mentor relationships including demographics of the mentors, racial and ethnicity matching with mentors, information of up to three mentor relationships, type of mentorship (formal or informal), closeness of the mentor relationships, and whether their supervisor acted like a mentor for them. This study increased the understanding of the influence of mentorship on PHN retention.

Former PHNs Included

This study sought out the perspectives of former PHNs to better understand their experiences. Information about their reasons for leaving their agencies, mentor experiences and level of interest in returning to public health nursing contributes to the understanding of former and retired public health nurses' lived experiences. The information gleaned from their responses could contribute to retention and re-recruitment of former PHNs.

Anonymity

Since the survey was anonymously collected, participants experienced psychological safety to share their true sentiments regarding their current and former employers, mentors and supervisors. Their answers are not identifiable. Any qualitative answers that included specific agency or local level details were omitted in the final report.

Limitations of the Study

Sample Size

The study's sample size limited findings for the research question regarding having similar mentors. The relationship between mentor type and retention was not confirmed to be able to reject the claim of no effect. Greater sample size may have provided more evidence to support the influence of these variables.

Low Response Rate

The low response rate may have affected the results of the study. It is unknown if responders were more or less likely to leave their employers and if their reasons were similar or dissimilar to respondents. However, the response rate of 6.1% was like a Michigan nurses' workplace study by Friese et al (2024) who had response rates of 8.3% in 2022 and 7.4% in 2023. Future research with a larger sample size could determine with more certainty if mentor similarities or formal mentorship contribute to PHN retention.

Missing Data

Missing data, especially for Research Questions #1 about mentor type and #5 regarding racially concordant mentors, may have affected the ability to answer those questions well. Missing data for mentor type and mentor network type restricted the use of these variables in modeling. Qualitative data was only available for 51.7% of current PHNs and 60.6% of former PHNs. It is unknown if those who did not answer had perspectives similar or different than those who did answer.

One State

Although PHNs from three states were targeted for the study, most of the respondents were from a single state. Factors that could have influenced this imbalance were that more PHNs' email addresses were available from NC, the student was better known in NC and the Chief Public Health Nurse of NC shared information about the study to statewide PHN leaders. Readers are cautioned not to generalize the results to other states' PHN workforce because of this regional limitation.

Three Generational Spread

Although there are five generations in the public health nursing workforce, most

respondents in this study were from only three: Millennial, Gen X and Baby Boomer. Gen Z and Silent generation nurses made up less than 3% of the respondents of current PHNs and less than 4% of former PHNs. As Gen Z PHNs are the next emerging generation of nurses, it will be important to target research to better understand how to recruit and retain them in the public health workforce in future studies.

Cross-Sectional

This study was cross-sectional in structure. As such, former PHN respondents were asked to recall relationship details with past employers, mentors and supervisors that might have happened several years previously. A longitudinal format or collection of data at multiple time periods could shed more light on how mentorship influences PHN retention.

Summer Season Collection

The data collection months for the survey were July and August of 2024. This may have reduced public health nurse participation especially for school nurses who might have been on break from work. This could have affected PHNs who provided their work email addresses to their boards of nursing since they may not have received the invitation to participate until the window of enrollment was passed.

Conclusion

Recommendations for Public Health Practice

The study sought to determine if the PHN retention rate was different depending on mentorship factors. The following section presents the main findings of the study with recommendations for public health practice.

Capacity Building for Public Health Nurse Supervisors and Leaders. Having a mentor-like supervisor was found to be a benefit for PHN retention rates in this study. Agency

leadership style and actions were also on the minds of PHNs in the study. Actions to improve the skills of both supervisors and agency leaders may improve PHN retention.

Mentor-like Supervisor Style. Supervisory style and approach may impact public health nurse retention. Teaching PHN supervisors to be mentor-like could be accomplished when onboarding new supervisors, during annual supervisor training and when supervisors participate in mentor training. Normalizing mentor-like supervision throughout the agency might promote retention at multiple levels.

Leaders' Performance. Unsupportive leadership concerns received top ranking for why current PHNs were planning to leave and why former PHNs left their employers in this study. Attention to how leaders in public health agencies interact with and affect public health nurses may improve PHN retention. Agencies that encourage and train their leaders to be supportive, fair, empathetic and receptive to hearing from the PHNs on their teams may encourage PHN retention.

In their scoping review of Millennial nurse retention studies, McClain et al (2022) described two umbrella areas of intervention for improved retention: leadership improvement and workplace environment change. Leaders' behaviors determine the quality of organizational communication, opportunities for nurse engagement in the workplace and the health of the work environment. Pro-retention experiences of trust building, feelings of appreciation, opportunities for advancement and participation in decision-making are possible in organizational cultures where leaders invest in their teams (McClain et al., 2022). Public health agencies experiencing high PHN attrition may benefit from leadership discussions and shifting their approach to leading their agencies with these supportive strategies in mind.

Formal Mentorship Programs for Public Health Nurses. Formal mentorship programs

have shown retention benefits in previous nursing studies (Vidal & Olley, 2021; Newman, 2017). In this study, formal mentorship showed possible retention benefits compared to informal mentorship. Being a mentor indicated an attrition risk. Balancing these two findings and related studies, the following observations and recommendations are extended regarding mentorship at public health agencies.

Agencies Benefit from Having a Formal Mentorship Program. Both PHNs and their employers may benefit from having well-designed formal mentoring programs available to their staff. Mentorship is a strategy that may help to reduce PHN burnout and attrition (Watts-Isley et al, 2024). Having an agency mentor program may provide access to mentors for more nurses. Retaining PHNs in the agency saves money. According to a recent study, the costs of planning, programming, training and materials needed to run a mentorship program would soon pay for itself by saving agencies the costs of nurse replacement, estimated to be $52,350 each (Gill Bonanca, 2024). Mentor programs can be designed in-house or with the help of mentoring models such as the Robert Wood Johnson Foundation Mentoring Program Toolkit (Choi et al., 2017). Using creative mentee interaction methods, such as sharing stories and subsequent reflection moments, may improve the effectiveness of mentoring (Durrant et al., 2024). Mentor programs can be tracked and evaluated through established mentoring online platforms or internal agency methods (Johnson et al., 2024).

Offer Formal Mentorship Widely. Experiencing and desiring mentorship was not exclusive to young nurses in this study. Nurses of all ages participated as mentees in the study. Although many mentor programs are designed for new nurses only, when planning formal mentorship programs, it may be beneficial to open the mentorship opportunity widely to more nurses since mentorship can assist in learning new roles, supporting career advancement and

providing psychosocial camaraderie. Mentorship programs could have tailored tracks for new nurses, nurses in new roles, nurses wanting to learn new skills or nurses primarily seeking psychosocial support. Johnson et al. (2024) recommended offering group mentorship for more than just new nurses since other nurses may need support for role advancement or emotional support. Since mentorships take time and commitment from staff members, public health leadership support is required for mentoring programs to be widely available to public health nurses (Berndtsson et al., 2024).

Choose Established PHNs as Mentors and Support the Mentors. Selecting mentors who have more experience in the agency may be beneficial to retain PHN mentors. Being a mentor may be more taxing on PHNs early in their careers. Structuring formal mentor programs to include clear mentor role definition, mentor training in psychosocial interventions (such as cognitive behavioral therapy techniques), ongoing mentor support through mentor coaching, co-mentor support, and group mentorship with more than one mentor supporting a group of mentees may improve the mentors' experience. Mentor training that includes a variety of methods, including training games, to build trust, camaraderie and adaptation to the role may improve the mentors' experience (Almeida et al., 2024). Ideally, mentors would have a mentor-like supervisor to support them in their mentor role, which may also improve mentor retention. Providing recognition and incentives for mentors, such as credit for career ladder progress or points on their annual performance appraisals, may encourage PHN mentors to continue in the role and attract new mentors to volunteer (Johnson et al., 2024).

Train Supervisors to be Mentor-like. This study sheds light on the benefits of having a mentor-like supervisor for PHN retention. Incorporating this knowledge into PHN supervisor training and onboarding, annual supervisor training, mentor training and formal mentoring

curriculum would widen the benefits of mentorship beyond those who directly participate in mentor programs. Mentors who are already supervisors could be encouraged to be mentor-like to their own teams as well as their mentees. Mentees who are supervisors (or aspiring to be) could receive coaching for their own professional growth and training to be more mentor-like in their approach with colleagues.

Focus on Millennial PHNs. This study spotlights the growing need for public health agencies to focus strategies to support the Millennial public health nurse. Millennial nurses in this study had a lower retention rate than older nurses and reported a lower rate of mentor-like supervision. Public health leaders may wish to pay particular attention to Millennial PHNs' retention interests by offering supportive mentor-like supervision and mentorship opportunities. This study confirmed other research studies that have found that Millennial nurses are more likely to stay in a supportive workplace that includes attention and engagement from leaders, higher pay, opportunities for professional growth and part-time options for employment (O'Hara et al., 2019; Waltz et al., 2020; Keith et al., 2021). Because of the aging of the PHN workforce, younger nurses need to be recruited and retained so the public health work can continue uninterrupted. PHNs in their late 20's through early 40's are looking for fair pay, advancement opportunities, good work relationships and work life balance. Part-time positions and flexible work schedules may be particularly attractive to Millennial PHNs. Public health agencies may improve the retention of this important nurse subset by offering fair salaries, formal mentorship, supportive supervision, accessible career ladders, role cross-training and job flexibility.

Address Public Health Nurse Burnout. PHNs' mental health challenges were brought out in this study. Burnout and exhaustion tied for the top reason current PHNs in the study were planning to leave their agency. PHNs who are overworked, exhausted and emotionally drained

will not do their best work and may decide to leave their positions altogether. However, hiring replacement nurses will not solve vacancy problems if current nurses continue to leave because of exhaustion. Public health leaders who prioritize the wellness and satisfaction of their current PHN staff members may improve their retention prospects. Addressing underlying contributing factors of leadership shortcomings and workplace environment stressors could mitigate and prevent PHN burnout. Streamlining paperwork and documentation expectations, reducing PHN vacancies that add to overwork for existing nurses, offering mentorship, and providing time for supportive supervision, appreciation and workplace camaraderie may reduce PHNs' job stress. Nurse mentor programs that include specialized training for mentors in therapeutic methods for group application with mentees showed promise for the reduction of work stress and burnout (Ohue & Menta, 2024).

Restructuring PHN Positions to Accommodate Retired and Parenting PHNs. This study included former public health nurses in ways that had not been explored previously. Making more job accommodation for near retirement, retired and parenting PHNs could result in retention or re-recruitment of experienced PHNs. Seasoned PHNs in this study signaled an interest in staying engaged with or returning to work in public health if offered alternatives to full-time, in-office work. Offering part-time positions may increase a public health agency's attractiveness for retired, soon-to-retire and parenting PHNs. Developing meaningful work-from-home positions in areas such as communicable disease tracking, telehealth care management, staff training, or public health program management could result in win-win situations for both the PHN and the agency. Offering part-time public health clinic-based, care management or school nurse positions could be attractive to PHNs who desire part-time work while filling important agency vacancies. Former and retired PHNs may be an untapped workforce pool for

public health agencies to consider in their recruitment plans.

Summary and Opportunities for Further Research

The important issue of PHN retention merits continued research. This study suggests the benefits of mentor-like supervision for PHN retention. This study contributes to the understanding of formal mentorship and PHN retention, the reasons PHNs decide to leave their agencies and the special challenges of retaining Millennial PHNs, all of which require more research to understand fully.

The possibility that being a mentor might contribute to attrition for some PHNs was a finding that merits more investigation to see if this is confirmed in further studies, what are the contributing factors, if this applies to formal and informal mentors equally, and what are viable solutions to reducing mentor attrition. This study advanced the understanding of the experiences of retired and former PHNs. More research would be beneficial to confirm how to re-recruit this PHN subset back into the public health nursing workforce. To better reflect the communities that public health agencies serve, more research is needed to understand how to support more BIPOC PHNs to enter and remain in the workforce. Finally, one variable not studied that may have an association with PHN retention is having access to a pension fund for retirement. Since many PHNs are local government employees, understanding if having a pension plan is associated with retention would be helpful to explore in future research.

References

AMN Healthcare (2018). Survey of Millennial Nurses: A Dynamic Influence on the Profession. https://www.amnhealthcare.com/industry-research/survey-of-Millennial-nurses-2018/

ANA (2022). Public Health Nursing: Scope and Standards of Practice (3rd Ed.). Silver Spring, MD. ANA.

ASTHO (2022) Legislative Overview Series: 2022 Public Health Spotlight: Covid-19 Pandemic Further Strains Public Health Workforce. https://www.astho.org/topic/report/

Adedokun, A. D. (2014). Mentoring, leadership behaviors, and career success, of african american female faculty and administrators in higher education (Order No. 3611841). Available from ProQuest Dissertations & Theses Global. (1504639769). Retrieved from https://www.proquest.com/dissertations-theses/mentoring-leadership-behaviors-career-success/docview/1504639769/se-2

Allen, T. D., Day, R., & Lentz, E. (2005). The Role of Interpersonal Comfort in Mentoring Relationships. Journal of Career Development, 31(3), 155-169. https://10.1007/s10871-004-2224-3

Allen, T. D., Day, R., & Lentz, E. (2005). The Role of Interpersonal Comfort in Mentoring Relationships. Journal of Career Development, 31(3), 155-169. https://10.1007/s10871-004-2224-3

Allen, T. D., & Eby, L. T. (2003). Relationship effectiveness for mentors: Factors associated with learning and quality. Journal of Management, 29(4), 469-486

. https://10.1016/S0149-2063(03)00021-7

Allen, T. D., & Eby, L. T. (2010). In Allen T. D., Eby L. T. (Eds.), The Blackwell handbook of mentoring: a multiple perspectives approach. (Paperback ed.). WILEY. https://10.1002/9780470691960

Allen, T. D., Eby, L. T., Chao, G. T., & Bauer, T. N. (2017). Taking Stock of Two Relational Aspects of Organizational Life: Tracing the History and Shaping the Future of Socialization and Mentoring Research. Journal of Applied Psychology, 102(3), 324-337. https://10.1037/apl0000086

Allen, T. D., Eby, L. T., & Lentz, E. (2006a). Mentorship Behaviors and Mentorship Quality Associated with Formal Mentoring Programs: Closing the Gap Between Research and Practice. Journal of Applied Psychology, 91(3), 567-578. https://10.1037/0021-9010.91.3.567

Allen, T. D., Eby, L. T., Poteet, M. L., Lentz, E., & Lima, L. (2004). Career Benefits Associated With Mentoring for Protégés: A Meta-Analysis. Journal of Applied Psychology, 89(1), 127-136. https://10.1037/0021-9010.89.1.127

Allen, T. D., Lentz, E., & Day, R. (2006b). Career Success Outcomes Associated With Mentoring Others: A Comparison of Mentors and Nonmentors. Journal of Career Development, 32(3), 272-285. https://10.1177/0894845305282942

Almeida, I., Pinto, C., Lima, A., Moreira, T., & Fernandes, C. S. (2024). Game4NurseSupervisor: Development of a board game for nursing mentoring. Nurse Education in Practice, 76https://10.1016/j.nepr.2024.103939

Auerbach D. I., Buerhaus P. I., Donelan K., Staiger D. O. (2024). Projecting the future registered nurse workforce after the COVID-19 pandemic. JAMA Health Forum , 5(2), e235389. https://doi.org/10.1001/jamahealthforum.2023.5389

Baskin, R., Lengetti, E., & Mariani, B. (2020). NLN Mentoring Toolkit. ().National League for Nurses. https://www.nln.org/docs/default-source/default-document-library/nln-mentoring-toolkit-2022.pdf?sfvrsn=91c51d41_3

Beam, R. J., O'Brien, R. A., & Neal, M. (2010). Reflective Practice Enhances Public Health Nurse Implementation of Nurse-Family Partnership. Public Health Nursing (Boston, Mass.), 27(2), 131-139. https://10.1111/j.1525-1446.2010.00836.x

Beck, A. J., & Boulton, M. L. (2012). Building an effective workforce: a systematic review of public health workforce literature. *American Journal of Preventive Medicine, 42*(5 Suppl 1), 6. https://10.1016/j.amepre.2012.01.020

Beck, A. J., & Boulton, M. L. (2016). The Public Health Nurse Workforce in U.S. State and Local Health Departments, 2012. Public Health Reports (1974), 131(1), 145-152. https://10.1177/003335491613100121

Becker, S. I., & Maughan, E. (2017). A Descriptive Study of Differing School Health Delivery Models. *The Journal of School Nursing, 33*(6), 415-425. https://10.1177/1059840517725788

Belcher, H. M. E., Copeland-Linder, N., Stone, J., Waters, C. R., Kuo, A., Moerchen, V., Olaleye, O., Salihu, H. M., Vamos, C., Brown, C., & Reddy, M. M. (2022). MCH Pipeline Training Program: Connecting with Academia to Build Capacity Through

Mentoring. Maternal and Child Health Journal, 26(Suppl 1), 37-43. https://10.1007/s10995-022-03397-3

Berndtsson, P., Skyvell-Nilsson, M., Brink, E., & Berghammer, M. (2024). Commitment and efforts to maintain mentoring: Nurse managers' perceptions of structuring mentoring provision for new nurses in a hospital setting. Journal of Clinical Nursing, 33(9), 3700–3710. https://10.1111/jocn.17219

Berthelsen, C., & Hansen, C. A. (2024). Should I Stay or Should I Go–A rapid qualitative study of principal deteriorating factors experienced by nurses relating to their intentions to leave their current position in a medical hospital department. Scandinavian Journal of Caring Sciences, n/ahttps://10.1111/scs.13246

Bibbins, S. E. (2021). Retention of Millennial Nurses: A Qualitative Phenomenological Study Available from ProQuest Central, ProQuest Dissertations & Theses Global. (2590162020). https://www.proquest.com/dissertations-theses/retention-Millennial-nurses-qualitative/docview/2590162020/se-2?accountid=10639

Bogaert, K., Castrucci, B. C., Gould, E., Sellers, K., & Leider, J. P. (2019). Changes in the State Governmental Public Health Workforce: Demographics and Perceptions, 2014-2017. Journal of Public Health Management and Practice, 25 Suppl 2, Public Health Workforce Interests and Needs Survey 2017(2), S58-S66. https://10.1097/PHH.0000000000000933

Bozionelos, N. (2004). Mentoring provided: Relation to mentor's career success, personality, and mentoring received. Journal of Vocational Behavior, 64(1), 24-46. https://10.1016/S0001-8791(03)00033-2

Brass, D. J. (1984). Being in the Right Place: A Structural Analysis of Individual Influence in an Organization. Administrative Science Quarterly, 29(4), 518-539. https://10.2307/2392937

Brook, J., Aitken, L., Webb, R., MacLaren, J., & Salmon, D. (2019). Characteristics of successful interventions to reduce turnover and increase retention of early career nurses: A systematic review. International Journal of Nursing Studies, 91, 47-59. https://10.1016/j.ijnurstu.2018.11.003

Bryant-Genevier, J., Rao, C. Y., Lopes-Cardozo, B., Kone, A., Rose, C., Thomas, I., Orquiola, D., Lynfield, R., Shah, D., Freeman, L., Becker, S., Williams, A., Gould, D. W., Tiesman, H., Lloyd, G., Hill, L., & Byrkit, R. (2021). Symptoms of Depression, Anxiety, Post-Traumatic Stress Disorder, and Suicidal Ideation Among State, Tribal, Local, and Territorial Public Health Workers During the COVID-19 Pandemic — United States, March–April 2021. MMWR.Morbidity and Mortality Weekly Report, 70(26), 947-952. https://10.15585/mmwr.mm7026e1

CNA (2024). California Nurses Association: Fresno County Department of Public Health Nurses Ratify New Contract With Strong Measures to Improve Patient Safety and Nurse Retention. (2024,). Targeted News Service https://www.proquest.com/wire-feeds/california-nurses-association-fresno-county/docview/2954177699/se-2?accountid=10639

Campbell, K. A., Van Borek, N., Marcellus, L., Landy, C. K., Jack, S. M., & on behalf of the British Columbia Healthy Connections Project Process Evaluation Research Team. (2020). "The hardest job you will ever love": Nurse recruitment, retention, and turnover in the Nurse-Family Partnership program in British Columbia, Canada. PloS One, 15(9), e0237028. https://10.1371/journal.pone.0237028

Canli, U., & Aquino, E. (2024). Barriers and Challenges Experienced by Latina Nurse Leaders. Hispanic Health Care International, 22(2), 92–98. https://10.1177/15404153231199175

Castro, S. L., & Scandura, T. A. (2004, November 3-6). The tale of two measures: Evaluation and comparison of Scandura's (1992) and Ragins and McFarlin's (1990) mentoring measures. Paper presented at the Southern Management Association Meeting, San Antonio, TX.

Celano, T., Harris, S., Sawyer, A. T., & Hamilton, T. (2021). Promoting Spiritual Well-Being Among Nurses. Nurse Leader, 20(2), 188-192. https://10.1016/j.mnl.2021.08.002

Chao, G. T. (1997). Mentoring Phases and Outcomes. Journal of Vocational Behavior, 51(1), 15-28. https://10.1006/jvbe.1997.1591

Chao, G. (2007). Mentoring and Organizational Socialization. In Belle Ragins and Kathy Kram (Ed.), The Handbook of Mentoring at Work: Theory, Research and Practice (pp. 179-196). Sage Publications.

Chao, G. T., Walz, P. M., & Gardner, P. D. (1992). Formal and informal mentorships: A comparison on mentoring functions and contrast with nonmentored counterparts. Personnel Psychology, 45(3), 619-636. https://10.1111/j.1744-6570.1992.tb00863.x

Charlie, M. L. (2017). *Ensuring the Continuation of the Public Health Nurses Workforce: Comparison of Work Outcomes with Nurses in Other Sectors of Healthcare* Available from ProQuest Dissertations & Theses Global. (2010531937). https://www.proquest.com/dissertations-theses/ensuring-continuation-public-health-nurses/docview/2010531937/se-2?accountid=10639

Choi, B., Zachary, L. Revised by DeWitty, V. (2017). Robert Wood Johnson Mentoring Program Toolkit: New Careers in Nursing 3rd Edition. (). https://campaignforaction.org/wp-content/uploads/2020/04/Mentoring-Toolkit-2017.pdf

Christou, H., Dookeran, N., Haas, A., Di Frances, C., Emans, S. J., Milstein, M. E., Kram, K. E., & Seely, E. W. (2017). Establishing Effective Mentoring Networks: Rationale and Strategies. *MedEdPORTAL, 13*, 10571. https://10.15766/mep_2374-8265.10571

Cottingham, S., DiBartolo, M. C., Battistoni, S., & Brown, T. (2011). Partners In Nursing: A Mentoring Initiative to Enhance Nurse Retention. Nursing Education Perspectives, 32(4), 250-5

Crossen, E. M., & Hunter Revell, S. M. (2024). Feeling Valued as a Mid-Career Nurse: A Scoping Review. *Journal for Nurses in Professional Development*, https://10.1097/NND.0000000000001078

Cummings, J. N., & Higgins, M. C. (2006). Relational instability at the network core: Support dynamics in developmental networks. *Social Networks, 28*(1), 38-55. https://10.1016/j.socnet.2005.04.003

Davila, N., & Pina-Ramirez, W. (2018). What Works in Talent Development: Effective Onboarding. ATD Press.

de Beaumont Foundation and Association of State and Territorial Health Officials, (2023). *Public Health Workforce Interests and Needs Survey: 2021 Dashboard.* www.phwins.org/national. July 31, 2023

de Janasz, S. C., & Godshalk, V. M. (2013). The Role of E-Mentoring in Protégés' Learning and Satisfaction. Group & Organization Management, 38(6), 743-774. https://10.1177/1059601113511296

Diosdado, L. A. (2023). How Millennial nurses describe the influences of job embeddedness on intent to stay (Order No. 30418098). Available from ProQuest Dissertations & Theses Global. (2806654938). Retrieved from https://www.proquest.com/dissertations-theses/how-Millennial-nurses-describe-influences-job/docview/2806654938/se-2

Djiovanis, S. G. (2023). Effectiveness of Formal Mentoring on Novice Nurse Retention: A Comprehensive Literature Review. Journal for Nurses in Professional Development, 39(4), E66-E69. https://10.1097/NND.0000000000000838

Dobrow, S. R., Chandler, D. E., Murphy, W. M., & Kram, K. E. (2012). A Review of Developmental Networks: Incorporating a Mutuality Perspective. Journal of Management, 38(1), 210-242. https://10.1177/0149206311415858

Dobrow Riza, S., & Higgins, M. C. (2019). The Dynamics of Developmental Networks. *Academy of Management Discoveries, 5*(3), 221-250. https://10.5465/amd.2013.0029

Dougherty, T., & Dreher, G. (2007). Mentoring and Career Outcomes. In B. Ragins, & K. Kram (Eds.), The Handbook of Mentoring at Work: Theory, Research and Practice (pp. 51-93). Sage Publications.

Dreher, G. F., & Cox, Jr., T. H. (1996). Race, gender and opportunity: A study of compensation attainment and the establishment of mentoring relationships. Journal of Applied Psychology, 81, 297–308

Dunlap, J. J., Brewer, T. L., & Mainous, R. O. (2023). External Scholarship Mentors for DNP-Prepared Faculty: A Practice-Oriented Exemplar. Nurse Educator, 48(5), 240-246. https://10.1097/NNE.0000000000001409

Durrant, M., Oliver, C., Gottlieb, L., Frechette, J., Lavoie-Tremblay, M., & Cyr, G. (2024). Facilitated engagement approach: A novel approach to guide mentor conversations. Nurse Education Today, 137, 106152. https://10.1016/j.nedt.2024.106152

Eby, L. T. (1997). Alternative forms of mentoring in changing organizational environments: A conceptual extension of the mentoring literature. *Journal of Vocational Behavior, 51*(1), 125-144. https://10.1006/jvbe.1997.1594

Eby, L. T., Allen, T. D., Hoffman, B. J., Baranik, L. E., Sauer, J. B., Baldwin, S., Morrison, M. A., Kinkade, K. M., Maher, C. P., Curtis, S., & Evans, S. C. (2013). An Interdisciplinary Meta-Analysis of the Potential Antecedents, Correlates, and Consequences of Protégé Perceptions of Mentoring. Psychological Bulletin, 139(2), 441-476. https://10.1037/a0029279

Eby, L. T., Butts, M. M., Hoffman, B. J., & Sauer, J. B. (2015). Cross-Lagged Relations Between Mentoring Received From Supervisors and Employee OCBs: Disentangling Causal Direction and Identifying Boundary Conditions. *Journal of Applied Psychology, 100*(4), 1275-1285. https://10.1037/a0038628

Eby, L. T., & Lockwood, A. (2005). Protégés' and mentors' reactions to participating in formal mentoring programs: A qualitative investigation. *Journal of Vocational Behavior, 67*(3), 441-458. https://10.1016/j.jvb.2004.08.002

Eby L., Rhodes, J. & Allen T. (2010). In Allen T., & Eby .(Eds.), The Blackwell handbook of mentoring: a multiple perspectives approach. (Paperback ed.). WILEY. https://10.1002/9780470691960

Eddy, E., Tannenbaum, S., Alliger, G., D'Abate, C., & Givens, S. (2001). Mentoring in industry: The top 10 issues when building and supporting a mentoring program. Technical report prepared for the Naval Air Warfare Training Systems Division (Contract No. N61339-99-D-0012).

Ephraim, N. (2021). Mentoring in nursing education: An essential element in the retention of new nurse faculty. Journal of Professional Nursing, 37(2), 306-319. https://10.1016/j.profnurs.2020.12.001

Faller, M., & Gogek, J. (2019). Break From the Past: Survey Suggests Modern Leadership Styles Needed for Millennial Nurses. Nurse Leader, 17(2), 135–140. https://10.1016/j.mnl.2018.12.003

Finkelstein, L. M., Allen, T. D., Ritchie, T. D., Lynch, J. E., & Montei, M. S. (2012). A dyadic examination of the role of relationship characteristics and age on relationship satisfaction in a formal mentoring programme. European Journal of Work and Organizational Psychology, 21(6), 803-827. https://10.1080/1359432X.2011.594574

Finley, F. R., Ivanitskaya, L. V., & Kennedy, M. H. (2007). Mentoring junior healthcare administrators: a description of mentoring practices in 127 U.S. hospitals. Journal of Healthcare Management, 52(4), 260-269. https://10.1097/00115514-200707000-00009

Fitchner, J. (2024). The Peak 65 Zone is Here - Creating a New Framework for America's Retirement Security. (). https://www.protectedincome.org/wp-content/uploads/2024/01/Whitepaper_Fichtner.pdf

Foley, L., Avramidis, P., & Randall, S. (2021). New to the community setting: nurses' experiences and the importance of orientation. Australian Journal of Primary Health, 27(1), 50. https://10.1071/PY20129

Fréchette J., Gottlieb L.N., Durrant M.: SBNH-L Mentorship Program Guide. 2021.Unpublished work. Ingram School of Nursing, McGill University

Freiheit, J. (2017). *Understanding Public Health Professional Socialization and Professional Identity Formation Experiences* (Ph.D.). Available from ProQuest Central, ProQuest Dissertations & Theses Global. (1994205413). https://www.proquest.com/dissertations-theses/understanding-public-health-professional/docview/1994205413/se-2?accountid=10639

Friday, L. (2014). The effects of a pre-licensure extern program and nurse residency program on new graduate outcomes and retention https://go.exlibris.link/YWnYJM6P

Friese C., Medvec B., Marriott DJ, et al. (2024). Changes in Registered Nurse Employment Plans and Workplace Assessments. *JAMA Netw Open.* 2024;7(7):e2421680. doi:10.1001/jamanetworkopen.2024.21680

Foster, S. (2019). Retaining nurses past retirement. British Journal of Nursing (Mark Allen

Publishing), 28(10), 658. https://10.12968/bjon.2019.28.10.658

Galuska, L., Murray, K., Rodriguez, M. & Wilson, R. (2023). Strategies to Stay. Nursing Administration Quarterly, 47 (1), 64-71. doi: 10.1097/NAQ.0000000000000559.

Gill-Bonanca, K. (2024). Mentorship: A strategy for nursing retention. American Nurses Association. https://www.myamericannurse.com/mentorship-strategy/

Gray, D. E. (2010). Towards the lifelong skills and business development of coaches: an integrated model of supervision and mentoring. *Coaching : An International Journal of Theory, Research & Practice, 3*(1), 60-72. https://10.1080/17521880903559705

Gwon, S. H., Cho, Y. I., Paek, S., & Ke, W. (2020). Public health nurses' workforce factors and population health outcomes in the United States. *Public Health Nursing (Boston, Mass.), 37*(6), 829-836. https://10.1111/phn.12793

Gwon, S. H., Thongpriwan, V., Kett, P., & Cho, Y. (2023). Public health nurses' perceptions and experiences of emergency preparedness, responsiveness, and burnout during the COVID-19 pandemic. *Public Health Nursing (Boston, Mass.), 40*(1), 124-134. https://10.1111/phn.13141

Haggard, D. L., Dougherty, T. W., Turban, D. B., & Wilbanks, J. E. (2011). Who Is a Mentor? A Review of Evolving Definitions and Implications for Research. SAGE Publications. https://10.1177/0149206310386227

Halfer, D., Graf, E., & Sullivan, C. (2008). The organizational impact of a new graduate pediatric nurse mentoring program. Nursing Economic, 26(4), 243-249.

Halvorson, M. A., Finney, J. W., Bi, X., Maisel, N. C., Hayashi, K. P., Weitlauf, J. C., & Cronkite, R. C. (2015). The Changing Faces of Mentorship: Application of a Developmental

Network Framework in a Health Services Research Career Development Program. Clinical and Translational Science, 8(6), 824-829. https://10.1111/cts.12355

Harris, R., Covington, K., Colford, C., Denizard-Thompson, N., Contarino, M., Evans, K., Zaas, A., Kraemer, M. S., & McNeill, D. (2021). Focusing on Diversity: A Regional Internal Medicine Residency Viewpoint on Underrepresented Minority Support, Retention, and Mentoring. Journal of Graduate Medical Education, 13(2), 181-188. https://10.4300/JGME-D-20-00729.1

Henderson Betkus M, MacLeod ML. (2004). Retaining public health nurses in rural British Columbia: the influence of job and community satisfaction. Can J Public Health. 2004 Jan-Feb;95(1):54-8. doi: 10.1007/BF03403635. PMID: 14768743; PMCID: PMC6975568.

Hermansson, S. K., Kasén, A., Hilli, Y., Norström, F., Vaag, J. R., & Bölenius, K. (2024). Exploring registered nurses' perspectives as mentors for newly qualified nurses: a qualitative interview study. BMJ Open, 14(5)https://10.1136/bmjopen-2023-082940

Higgins, M. C. (2000). The more, the merrier? Multiple developmental relationships and work satisfaction. *The Journal of Management Development, 19*(4), 277-296. https://10.1108/02621710010322634

Higgins, M. C., Dobrow, S. R., & Chandler, D. (2008). Never quite good enough: The paradox of sticky developmental relationships for elite university graduates. *Journal of Vocational Behavior, 72*(2), 207-224. https://10.1016/j.jvb.2007.11.011

Higgins, M., Dobrow, S. R., & Roloff, K. S. (2010). Optimism and the boundaryless career: The role of developmental relationships. *Journal of Organizational Behavior, 31*(5), 749-769. https://10.1002/job.693

Higgins, M. C., & Kram, K. E. (2001). Reconceptualizing Mentoring at Work: A Developmental Network Perspective. The Academy of Management Review, 26(2), 264-288. https://10.2307/259122

Higgins, M. C., & Thomas, D. A. (2001). Constellations and careers: toward understanding the effects of multiple developmental relationships. Journal of Organizational Behavior, 22(3), 223-247. https://10.1002/job.66

Hignight, M., Boss, K., Culcuoglu, M., & Gorsuch, P. (2024). Development of an Emergency Nurse Internship to Promote a Healthy Work Environment and Improve Nurse Retention. Journal of Emergency Nursing, https://10.1016/j.jen.2024.06.006

Hoke, A. M., Greenawalt, K., VanDyke, E., Zearfaus, A., & Sekhar, D. L. (2024). Evaluation of the Inaugural Pennsylvania School Nurse Mentorship Program. The Journal of school nursing : the official publication of the National Association of School Nurses, 10598405241301995. Advance online publication. https://doi.org/10.1177/10598405241301995

Huybrecht, S., Loeckx, W., Quaeyhaegens, Y., De Tobel, D., & Mistiaen, W. (2011). Mentoring in nursing education: Perceived characteristics of mentors and the consequences of mentorship. Nurse Education Today, 31(3), 274-278. https://10.1016/j.nedt.2010.10.022

Ibarra, H. (1995). Race, Opportunity, and Diversity of Social Circles in Managerial Networks. Academy of Management Journal, 38(3), 673-703. https://10.5465/256742

Johnson, J., Bradley, K., Bugos, K., & Hernandez, G. (2024). Mentoring Models to Support Transition to Practice Programs: One Size Does Not Fit All. The Journal of Continuing Education in Nursing, 55(4)https://10.3928/00220124-20240318-04

Johnson, W. B. (2007). Transformational Supervision: When Supervisors Mentor. *Professional Psychology, Research and Practice, 38*(3), 259-267. https://10.1037/0735-7028.38.3.259

Jones, J. (2016). Learning within formal mentoring relationships: what mentees and mentors learn at different phases of the mentoring life-cycle and factors that moderate the learning process https://eastcarolina.summon.serialssolutions.com/

Jones, S., Deckers, C. M., Strand, D., Bissmeyer, H., Bowman, W. J. W., & Mathe, D. G. (2017). Succession Planning: Creating A Case for Hiring New Graduates. Nursing Economic, 35(2), 64-87.

Jones, R. J., Woods, S. A., & Guillaume, Y. R. F. (2016). The effectiveness of workplace coaching: A meta-analysis of learning and performance outcomes from coaching. Journal of Occupational and Organizational Psychology, 89(2), 249-277. https://10.1111/joop.12119

Jung, S., & Kim, J. (2024). The experience of good mentoring focused on overcoming turnover intention among Millennial nurses. Frontiers in Medicine, 11, 1288829. https://10.3389/fmed.2024.1288829

Kakyo, T. A., Xiao, L. D., & Chamberlain, D. (2022). Benefits and challenges for hospital nurses engaged in formal mentoring programs: A systematic integrated review. International Nursing Review, 69(2), 229-238. https://10.1111/inr.12730

Kanter, R. M. (1977). Men and women of the corporation. Basic Books.

Kark, R., Meister, A., & Peters, K. (2022). Now You See Me, Now You Don't: A Conceptual Model of the Antecedents and Consequences of Leader Impostorism. Journal of Management, 48(7), 1948-1979. https://10.1177/01492063211020358

Keith, A., Warshawsky, N. & Talbert, S. (2021). Factors That Influence Millennial Generation Nurses' Intention to Stay. JONA: The Journal of Nursing Administration, 51 (4), 220-226. doi: 10.1097/NNA.0000000000001001.

Kneipp, S., Edmonds, J., Cooper, J., Campbell, L., Little, S., & Mix, A. (2022). Enumeration of Public Health Nurses in the United States: Limits of Current Standards. American Journal of Public Health, Suppl.Supplement 3, 112https://10.2105/AJPH.2022.306782

Krackhardt, D. (1990). Assessing the Political Landscape: Structure, Cognition, and Power in Organizations. Administrative Science Quarterly, 35(3), 342.

Kram, K. E. (1983). Phases of the Mentor Relationship. *Academy of Management Journal, 26*(4), 608-625. https://10.5465/255910

Kram, K. (1985). Mentoring at Work: Developmental Relationships in Organisational Life. Administrative Science Quarterly. 30. 10.2307/2392687.

Kramer, D. S., McCue, V. Y., Butler, E., Prentiss, A. S., Ojeda, M. M., Tugg, K. K., Fuentes, V., & Bonet, S. (2021). The Art of Nurse Mentoring: A Framework of Support. Nursing & Health Sciences Research Journal, 4(1), 16-25. https://10.55481/2578-3750.1097

Lafleur, A. K., & White, B. J. (2010). Appreciating mentorship: the benefits of being a mentor. Professional Case Management, 15(6), 305-311. https://10.1097/NCM.0b013e3181eae464

Lankau, M. J., & Scandura, T. A. (2002). An investigation of personal learning in mentoring relationships: Content, antecedents, and consequences. Academy of Management Journal, 45(4), 779-790. https://10.2307/3069311

Larsen R, Ashley J, Ellens T, Frauendienst R, Jorgensen-Royce K & Zelenak M (2018). Development of a new graduate public health nurse residency program using the core competencies of public health nursing.. Public Health Nursing, 35(6), 606-612. https://dx.doi.org/10.1111/phn.12528

Lee, J. W. (2019). Exploring the antecedents of employees' developmental network characteristics: does context matter? *Asia Pacific Journal of Human Resources, 57*(1), 103-124. https://10.1111/1744-7941.12145

Leider, J. P., Castrucci, B. C., Robins, M., Bork, R. H., Fraser, M. R., Savoia, E., Piltch-Loeb, R., & Koh, H. K. (2023a). The Exodus Of State And Local Public Health Employees: Separations Started Before And Continued Throughout COVID-19. Health Affairs (Millwood, Va.), 42(3), 338-15. https://10.1377/hlthaff.2022.01251

Leider, J. P., Shah, G. H., Yeager, V. A., Yin, J., & Madamala, K. (2023b). Turnover, COVID-19, and Reasons for Leaving and Staying Within Governmental Public Health. *Journal of Public Health Management and Practice, 29*(Suppl 1), S54-S63. https://10.1097/PHH.0000000000001634

Lentz, E., & Allen, T. D. (2009). The Role of Mentoring Others in the Career Plateauing Phenomenon. Group & Organization Management, 34(3), 358-384. https://10.1177/1059601109334027

Lentz, E. & Allen, T. (2010). In Allen T. D., Eby L. T. (Eds.), The Blackwell handbook of mentoring: a multiple perspectives approach. (Paperback ed.). WILEY. https://10.1002/9780470691960

Lewis, C. P., Johnson, B. H., Donnell, C., Phillips, T., Jackson, D., Backus, M., Payne, A., Greenwell, R. W., & Wentz, A. (2019). The power of mentorship. Nursing Management, 50(7), 38-44. https://10.1097/01.NUMA.0000558524.37370.ce

Levinson, D. J. 1. (. J. (1978). The Seasons of a man's life (1st ed.). Knopf.

Lincoln, J. R., & Miller, J. (1979). Work and Friendship Ties in Organizations: A Comparative Analysis of Relational Networks. Administrative Science Quarterly, 24(2), 181-199. https://10.2307/2392493

Low, R., King, S., & Foster-Boucher, C. (2019). Learning to Bounce Back: A Scoping Review About Resiliency Education. *Journal of Nursing Education, 58*(6)https://10.3928/01484834-20190521-02

Lysfjord, E. M., & Skarstein, S. (2024). Empowering Leadership: A Journey of Growth and Insight Through a Mentoring Program for Nurses in Leadership Positions. Journal of healthcare leadership, 16, 443–454. https://doi.org/10.2147/JHL.S482087

MacKusick, C. I., & Minick, P. (2010). Why are nurses leaving? Findings from an initial qualitative study on nursing attrition. Medsurg Nursing, 19(6), 335-340.

Mancuso, G. (2020). Job satisfaction and turnover among Millennial nurses in public hospitals (Order No. 28029314). Available from ProQuest Dissertations & Theses Global. (2435770169). Retrieved from https://www.proquest.com/dissertations-theses/job-satisfaction-turnover-among-Millennial-nurses/docview/2435770169/se-2

Masimula, Q. K. (2014). Guidelines on Career Planning for First-Year Learner Nurses at a Nursing College in the Johannesburg Region https://go.exlibris.link/gD7BlPtD

Mayende, T. S., & Musenze, I. A. (2018). Ethical leadership and staff retention: the moderating role of job resources in Uganda's healthcare sector. SA Journal of Industrial Psychology, 44(1), 1-10. https://10.4102/sajip.v44i0.1531

McClain, A. , Palokas, M. , Christian, R. & Arnold, A. (2022). Retention strategies and barriers for Millennial nurses: a scoping review. JBI Evidence Synthesis, 20 (1), 121-157. doi: 10.11124/JBIES-20-00577.

McCormack, C., & West, D. (2006). Facilitated group mentoring develops key career competencies for university women: a case study. *Mentoring & Tutoring, 14*(4), 409-431. https://10.1080/13611260600739290

McGuire, M. A. (2007). A joint perspective on mentoring: A look by senior military officers across the services on the prevalence and contribution of mentoring relationships https://go.exlibris.link/dwW9MNzq

Meier S. (2013). Concept analysis of mentoring. *Advances in Neonatal Care* , 13(5), 341–345. 10.1097/ANC.0b013e3182a14ca4

Messe, P., & Greenan, N. (2023). *Knowledge transmission in the second part of careers: does formal training matter?* ().https://10.1108/IJM-11-2021-0655 https://go.exlibris.link/4wSnhJs2

Methot, J. R., Rosado-Solomon, E. H., & Allen, D. G. (2018). The Network Architecture of Human Captial: A Relational Identity Perspective. The Academy of Management Review, 43(4), 723-748. https://10.5465/amr.2016.0338

Mezias, J. M., & Scandura, T. A. (2005). A Needs-Driven Approach to Expatriate Adjustment and Career Development: A Multiple Mentoring Perspective. Journal of International Business Studies, 36(5), 519-538. https://10.1057/palgrave.jibs.8400159

MNDOH (2019). Minnesota Department of Health. Public health interventions: Applications for public health nursing practice (2nd ed.)

Morrison, R. L., & Nolan, T. (2009). I get by with a little help from my friends ... at work. *Kōtuitui, 4*(1), 41-54. https://10.1080/1177083X.2009.9522443

Morton S. (2013). What support do health visitor mentors need? Community Pract. 2013 Aug;86(8):32-5. PMID: 23986990.

Myer, Sharon K. BA, BSN, RN; Amendolair, Darlene PhD, RN. Time is of the essence: Retain your older nurses. Nursing Management (Springhouse) 45(5):p 12-16, May 2014. | DOI: 10.1097/01.NUMA.0000446189.05284.88

National Council of States Board of Nursing (2021). The 2020 National Nursing Workforce Survey. Journal of Nursing Regulation, 12(1), S1–96.

NCDHHS (2024). Investing in North Carolina's Caregiving Workforce. NC Department of Health and Human Services. https://www.ncdhhs.gov/investing-north-carolinas-caregiving-workforce-recommendations-strengthen-north-carolinas-nursing/download?attachment

NCIPH (2020). North Carolina Institute for Public Health. Driving the future. Nursing supplement. https://sph.unc.edu/wp-content/uploads/sites/112/2014/09/LHD_Survey_supplement_nursing1.pdf

NCPHN (2022). NC Office of the Chief Public Health Nurse, & North Carolina Association of Public Health Nurse Administrators. Meaningful Mentorship. NC Public Health Nursing. https://ncpublichealthnursing.org/mentoring/

Nei, D., Snyder, L. A., & Litwiller, B. J. (2015). Promoting retention of nurses: A meta-analytic examination of causes of nurse turnover. Health Care Management Review, 40(3), 237-253. https://10.1097/HMR.0000000000000025

Newman, M. (2017). Improving Nurse Mentor Retention Through the Use of Nurse Residency Programs (D.N.P.). Available from ProQuest Dissertations & Theses Global. (1937909182). https://www.proquest.com/dissertations-theses/improving-nurse-mentor-retention-through-use/docview/

Noe, R.A., Greenberger, D.B. and Wang, S. (2002), "Mentoring: What we know and where we might go", Research in Personnel and Human Resources Management (Research in Personnel and Human Resources Management, Vol. 21), Emerald Group Publishing Limited, Leeds, pp. 129-173. https://doi.org/10.1016/S0742-7301(02)21003-8

Nottingham Chaplin, P. K., Baldonado, K., Bergren, M. D., Lyons, S. A., Murphy, M. K., & Bradford, G. E. (2020). 12 Components of a Strong Vision Health System of Care: Part 3—Standardized Approach for Rescreening. *NASN School Nurse, 35*(1), 10-14. https://10.1177/1942602X19890470

O'Donoghue, C. (2023). Exploring job and workplace factors associated with nurse retention in the Irish Healthcare System. *European Journal of Public Health, 33*(Supplement_2)https://10.1093/eurpub/ckad160.058

O'Hara, M. A., Burke, D., Ditomassi, M., & Palan Lopez, R. (2019). Assessment of Millennial Nurses' Job Satisfaction and Professional Practice Environment. *The Journal of Nursing Administration, 49*(9), 411-417. https://10.1097/NNA.0000000000000777

Ohue, T., & Menta, M. (2024). Effectiveness of Mentorship Using Cognitive Behavior Therapy to Reduce Burnout and Turnover among Nurses: Intervention Impact on Mentees. Nursing Reports, 14(2)https://10.3390/nursrep14020077

Parker, P., Wasserman, I., Kram, K. E., & Hall, D. T. (2015). A Relational Communication Approach to Peer Coaching. *The Journal of Applied Behavioral Science, 51*(2), 231-252. https://10.1177/0021886315573270

Pellegrini, E. K., & Scandura, T. A. (2005). Construct Equivalence across Groups: An Unexplored Issue in Mentoring Research. Educational and Psychological Measurement, 65(2), 323-335. https://doi.org/10.1177/0013164404268665

Perkins, R. T., Bamgbade, S., & Bourdeanu, L. (2023). Nursing Leadership Roles and Its Influence on the Millennial Psychiatric Nurses' Job Satisfaction and Intent to Leave. Journal of the American Psychiatric Nurses Association, 29(1), 15–24. https://10.1177/1078390320979615

Pfund, C., Byars-Winston, A., Branchaw, J., Hurtado, S., & Eagan, K. (2016). Defining Attributes and Metrics of Effective Research Mentoring Relationships. AIDS and Behavior, Suppl.Supplement, 20https://10.1007/s10461-016-1384-z

Pourshaban, D., Basurto-Dávila, R., & Shih, M. (2015). Building and Sustaining Strong Public Health Agencies: Determinants of Workforce Turnover. Journal of public health management and practice : JPHMP, 21 Suppl 6, S80–S90. https://doi.org/10.1097/PHH.0000000000000311

Pullen, A., & Indiana Wesleyan University. (2022). Implementation of a Virtual Nurse Residency Program for Public Health Nurses: A Pilot Study. Journal of the Georgia Public Health Association, 8(3), 159-164. https://10.20429/jgpha.2022.080319

Pulver, C. (2021). I Love it Here. Page Two Books.

R Core Team (2023). _R: A Language and Environment for Statistical Computing_. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>.

Ragins, B. R., & Cotton, J. L. (1999). Mentor functions and outcomes: A comparison of men and women in formal and informal mentoring relationships. *Journal of Applied Psychology, 84*(4), 529-550. https://10.1037/0021-9010.84.4.529

Ragins, B. R., Cotton, J. L., & Miller, J. S. (2000). Marginal Mentoring: The Effects of Type of Mentor, Quality of Relationship, and Program Design on Work and Career Attitudes. *Academy of Management Journal, 43*(6), 1177-1194. https://10.5465/1556344

Ragins, B. R. & Godshalk, V. (2007). Mentoring and Leadership: Standing at the Crossroads of Theory, Research, and Practice. In Ragins, B. R., & Kram, K. E. (Eds.), The Handbook of Mentoring at Work: Theory, Research, and Practice (2008). SAGE Publications, Incorporated. https://10.4135/9781412976619

Ragins, B. R., & Kram, K. E. (2008). In Belle Ragins, Ragins B. R., Kathy Kram and Kram K. E. (Eds.), The Handbook of Mentoring at Work: Theory, Research, and Practice. SAGE Publications, Incorporated. https://10.4135/9781412976619

Ragins, B. R., & Scandura, T. A. (1999). Burden or blessing? Expected costs and benefits of being a mentor. *Journal of Organizational Behavior, 20*(4), 493-509. https://10.1002/(SICI)1099-1379(199907)20:4

Ramaswami, A., & Dreher, G. (2010). In Allen T. D., Eby L. T. d. T.(Eds.), The Blackwell handbook of mentoring: a multiple perspectives approach. (Paperback ed.). WILEY. https://10.1002/9780470691960

Region IV Public Health Training Center. (2021). Modern Mentorship: Growing Public Health Leaders. Published September 30, 2021. https://r4phtc.org/modern-mentorship-growing-public-health-leaders/

Reiss-Brennan, B., Hayes, R., & McCauley, L. (2022). An Overlooked Strategic Powerhouse: How Nurses Can Rise to the Challenge of Integrating Public Health and Primary Care. *American Journal of Public Health (1971), 112*(S3), S253-S255. https://10.2105/AJPH.2022.306861

Rivera-Goba, M. V., & Nieto, S. (2007). Mentoring Latina Nurses: A Multicultural Perspective. *Journal of Latinos and Education, 6*(1), 35. https://10.1207/s1532771xjle0601_3

Rios, M. A. (2024). Exploring the relationship between leader-member relationship quality and mentorship (Order No. 31238238). Available from ProQuest Dissertations & Theses Global. (3043727666). Retrieved from https://www.proquest.com/dissertations-theses/exploring-relationship-between-leader-member/docview/3043727666/se-2

Roth, C., Wensing, M., Breckner, A., Mahler, C., Krug, K., & Berger, S. (2022). Keeping nurses in nursing: a qualitative study of German nurses' perceptions of push and pull factors to leave or stay in the profession. BMC Nursing, 21(1), 48. https://10.1186/s12912-022-00822-4

Rowen, L., McQuillan, K., Day, J., & Embert, C. (2024). Improving Retention Through a Purposeful Multidisciplinary Mentorship Program. *The Journal of Nursing Administration, 54*(4), 220–226. https://10.1097/NNA.0000000000001413

Royer, L. (2009). Structural and psychological empowerment of community /public health nurses (Order No. 3394595). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (305124817). Retrieved from https://www.proquest.com/dissertations-theses/structural-psychological-empowerment-community/docview/305124817/se-2

Scandura, T. A. (1992). Mentorship and career mobility: An empirical investigation. Journal of Organizational Behavior, 13(2), 169-174. https://10.1002/job.4030130206

Scandura, T. & Pellegrini, E. (2010). In Allen T. D., Eby L. T. (Eds.), The Blackwell handbook of mentoring: a multiple perspectives approach. (Paperback ed.). WILEY. https://10.1002/9780470691960

Scandura, T. A., & Ragins, B. R. (1993). The Effects of Sex and Gender Role Orientation on Mentorship in Male-Dominated Occupations. Journal of Vocational Behavior, 43(3), 251–265. https://10.1006/jvbe.1993.1046

Scandura, T. A., & Viator, R. E. (1994). Mentoring in public accounting firms: An analysis of mentor-protégé relationships, mentorship functions, and protégé turnover intentions. Accounting, Organizations and Society, 19(8), 717-734. https://10.1016/0361-3682(94)90031-0

Scandura, T. A., & Williams, E. A. (2004). Mentoring and transformational leadership: The role of supervisory career mentoring. Journal of Vocational Behavior, 65(3), 448-468. https://10.1016/j.jvb.2003.10.003

Schroyer, C. C., Zellers, R., & Abraham, S. (2020). Increasing Registered Nurse Retention Using Mentors in Critical Care Services. The Health Care Manager, 39(2), 85-99. https://10.1097/HCM.0000000000000293

Schulz, S. F. (1995). The benefits of mentoring. In M. W. Galbraith & N. H. Cohen (Eds.), Mentoring: New strategies and challenges (Vol. 66, pp. 57–68). San Francisco: Jossey-Bass.

Sheppard, F., Goins, T., Ross, R., Conte, K., & Zonin, N. (2022). Older Nurses' Perceptions of Workforce Retention Facilitators and Barriers During the COVID-19 Pandemic. Online Journal of Issues in Nursing, 27(3), 1–12. https://10.3912/OJIN.Vol27No03PPT75

Sibbald, S., Jegatheeswaran, J., Pocock, H., & Penney, G. (2020). A National Survey of Educational and Training Preferences and Practices for Public Health Nurses in Canada. *The Journal of Continuing Education in Nursing, 51*, 25+. https://link.gale.com/apps/doc/A676576981/HWRC?u=ncliveecu&sid=summon&xid=6ffbebe9

Smiley, R., Reid, M., & Martin, B. (2024). The Registered Nurse Workforce: Examining Nurses' Practice Patterns, Workloads, and Burnout by Race and Ethnicity. Journal of Nursing Regulation, 15(1), 65–79. https://10.1016/S2155-8256(24)00030-9

Smith, C., & Cantillon, P. (2024). Exemplar or facilitator: An exploration of the lived experience of nurse mentors supporting the adaptation of internationally educated nurses. The Clinical Teacher, 21(2), e13702–n/a. https://10.1111/tct.13702

Smith LS, McAllister LE, Snype Crawford C. (2001). Mentoring benefits and issues for public health nurses. Public Health Nurs. 2001 Mar-Apr;18(2):101-7. doi: 10.1046/j.1525-1446.2001.00101.x. PMID: 11285104.

Stewart, N. J., MacLeod, M. L. P., Kosteniuk, J. G., Olynick, J., Penz, K. L., Karunanayake, C. P., Kulig, J. C., Labrecque, M. E., & Morgan, D. G. (2020). The importance of organizational commitment in rural nurses' intent to leave. *Journal of Advanced Nursing, 76*(12), 3398-3417. https://10.1111/jan.14536

Stoeger, H., Balestrini, D. P., & Ziegler, A. (2021). Key issues in professionalizing mentoring practices. *Annals of the New York Academy of Sciences, 1483*(1), 5-18. https://10.1111/nyas.14537

Southend University Hospital NHS Foundation Trust (2019). Flexible Retirement & Retire and Return: A Guide for Staff and Managers. May 2018. http://tinyurl.com/ yxpovxcd. (accessed 13 May 2019)

Tomietto, M., Rappagliosi, C. M., Sartori, R., & Battistelli, A. (2015). Newcomer nurses' organisational socialisation and turnover intention during the first 2 years of employment. Journal of Nursing Management, 23(7), 851-858. https://10.1111/jonm.12224

Towns, D. M. (2011). Retaining the Millennial nurse in Public Health, Calgary Zone Alberta Health Services https://go.exlibris.link/1fMRWD00

Turban, D. B., Dougherty, T. W., & Lee, F. K. (2002). Gender, race, and perceived similarity effects in developmental relationships: The moderating role of relationship duration. *Journal of Vocational Behavior, 61*(2), 240-262. https://10.1006/jvbe.2001.1855

Ulep K. (2018). The Nurse Leader's Pivotal Role in Retaining Millennial Nurses. The Journal of nursing administration, 48(12), 604–608. https://doi.org/10.1097/NNA.0000000000000689

Van Emmerik, H., Gayle Baugh, S., & Euwema, M. C. (2005). Who wants to be a mentor? An examination of attitudinal, instrumental, and social motivational components. Career Development International, 10(4), 310-324. https://10.1108/13620430510609145

Vidal, J. M., & Olley, R. (2021). Systematic literature review of the effects of clinical mentoring on new graduate registered nurses' clinical performance, job satisfaction and job retention. Asia Pacific Journal of Health Management, 16(4), 70-82. https://10.24083/apjhm.v16i4.739

Vittinghoff, E., McCulloch, C. (2007). Relaxing the Rule of Ten Events per Variable in Logistic and Cox Regression. American Journal of Epidemiology, Volume 165, Issue 6, 15 March 2007, Pages 710–718, https://doi.org/10.1093/aje/kwk052

Volkert, D. (2021). Development and Implementation of a Strong Mentoring Program to Increase Scholarly Productivity and Support Nurse Faculty Retention. Nursing Education Perspectives, 42(6), E77-E78. https://10.1097/01.NEP.0000000000000837

Wald, H. S. (2020). Optimizing resilience and wellbeing for healthcare professions trainees and healthcare professionals during public health crises - Practical tips for an 'integrative resilience' approach. Medical Teacher, 42(7), 744-755. https://10.1080/0142159X.2020.1768230

Walker, L., & Clendon, J. (2018). Early nurse attrition in New Zealand and associated policy

implications. International Nursing Review, 65(1), 33-40. https://10.1111/inr.12411

Waltz, L. A., Muñoz, L., Weber Johnson, H., & Rodriguez, T. (2020). Exploring job satisfaction and workplace engagement in Millennial nurses. Journal of Nursing Management, 28(3), 673–681. https://10.1111/jonm.12981

Wanberg, C. R., Welsh, E. T., & Hezlett, S. A. (2004). Mentoring Research: A Review and Dynamic Process Model. Research in Personnel and Human Resources Management (pp. 39-124). Emerald Group Publishing Limited. https://10.1016/S0742-7301(03)22002-8

Ward-Smith, P., Peacock, A., Pilbeam, S., & Porter, V. (2023). Retention Outcomes When a Structured Mentoring Program Is Provided as Part of New Graduate Orientation. Journal for Nurses in Professional Development, 39(4), E75-E80. https://10.1097/NND.0000000000000849

Wasburn, M. H. (2007). Mentoring women faculty: an instrumental case study of strategic collaboration. *Mentoring & Tutoring*, *15*(1), 57-72. https://10.1080/13611260601037389

Watts-Isley J, Heflin MT, Byrd L, & Turnley MP (2024). Building an Interprofessional Health Workforce through Pathways, Training, and Retention. *North Carolina Medical Journal*. 2024;85(3):197-204. doi:10.18043/001c.117221

Watts Isley, J., Little, S. H., Sha, S., Vaughan, E., Wingate, K., & Aleshire, M. E. (2022). To stay or leave: Public health nurse workforce retention in North Carolina. Public Health Nursing (Boston, Mass.), 39(3), 609-617. https://10.1111/phn.12991

Weberg, D. (2010). Transformational leadership and staff retention: an evidence review with implications for healthcare systems. Nursing Administration Quarterly, 34(3), 246-258.

https://10.1097/NAQ.0b013e3181e70298

Weinberg, F. J., & Lankau, M. J. (2011). Formal Mentoring Programs: A Mentor-Centric and Longitudinal Analysis. Journal of Management, 37(6), 1527-1557. https://10.1177/0149206309349310

Williams, V. N., Brooks-Russell, A., McManus, B. M., Yost, E., Olds, D. L., & Tung, G. J. (2021). National survey of nurse home visitor collaboration with health care and social services. Public Health Nursing (Boston, Mass.), 38(5), 825-836. https://10.1111/phn.12897

Williams, V. N., McManus, B., Brooks-Russell, A., Yost, E., Olds, D. L., & Tung, G. J. (2023). Cross-sector Collaboration Between Public Health, Healthcare and Social Services Improves Retention: Findings from a Nurse Home Visiting Program. Prevention Science, 24(6), 1209-1224. https://10.1007/s11121-023-01538-w

Wilson, J. (2023). Nurse Retention Through Mentorship (D.N.P.). Available from ProQuest Dissertations & Theses Global. (2806282770).

Wong, B. L. H., Siepmann, I., Chen, T. T., Fisher, S., Weitzel, T. S., Nathan, N. L., & Saminarsih, D. S. (2021). Rebuilding to shape a better future: the role of young professionals in the public health workforce. Human Resources for Health, 19(1), 1-82. https://10.1186/s12960-021-00627-7

Xu, X., & Payne, S. C. (2014). Quantity, Quality, and Satisfaction With Mentoring: What Matters Most? Journal of Career Development, 41(6), 507-525. https://10.1177/0894845313515946

Yeager, V. A., & Wisniewski, J. M. (2017). Factors That Influence the Recruitment and Retention of Nurses in Public Health Agencies. Public Health Reports (1974), 132(5), 556-562. https://10.1177/0033354917719704

Yin, R.K. (2016). Qualitative Research from Start to Finish, Second Edition. New York: The Guilford Press. ISBN: 978-1-4625-1797-8. 386 pp.

Zhang, Y., Huang, X., Xu, S., Xu, C., Feng, X., & Jin, J. (2019). Can a one-on-one mentorship program reduce the turnover rate of new graduate nurses in China? A longitudinal study. Nurse Education in Practice, 40, 102616. https://10.1016/j.nepr.2019.08.010

Zhang, Y., Qian, Y., Wu, J., Wen, F., & Zhang, Y. (2016). The effectiveness and implementation of mentoring program for newly graduated nurses: A systematic review. Nurse Education Today, 37, 136-144. https://10.1016/j.nedt.2015.11.027

Appendix A: IRB Approval and Amendment Letters

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
Willis Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC
27834 Office **252-744-2914** · Fax **252-744-2284** · **rede.ecu.edu/umcirb/**

Notification of Exempt Certification

Staying on the Team: Public Health Nurse Retention and Mentorship

From: Social/Behavioral IRB
To: Christine Wanous
CC: Rashmita Basu
Date: 4/26/2024
Re: UMCIRB 23-002619

I am pleased to inform you that your research submission has been certified as exempt on 4/26/2024. This study is eligible for Exempt Certification under category # 2 AB.
It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.
This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

Description
Study Protocol or Grant Application
Recruitment Documents/Scripts Consent Forms

Surveys and Questionnaires

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.
The Chairperson (or designee) does not have a potential for conflict of interest on this study.

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
Willis Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** ·
rede.ecu.edu/umcirb/

Notification of Amendment Approval

From: Social/Behavioral IRB
To: Christine Wanous
CC: Rashmita Basu
Date: 6/28/2024
Re: Ame1 UMCIRB 23-002619
UMCIRB 23-002619
Staying on the Team: Public Health Nurse Retention and Mentorship

Your Amendment has been reviewed and approved using expedited review on 6/28/2024. It was the determination of the UMCIRB Chairperson (or designee) that this revision does not impact the overall risk/benefit ratio of the study and is appropriate for the population and procedures proposed.

Please note that any further changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must adhere to all reporting requirements for this study.

If applicable, approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Document	Description
Recruitment Methods(0.02)	Consent Forms
Recruitment Methods for Staying on the Team study 6.22.24.docx(0.01)	Recruitment Documents/Scripts
Staying_on_the_Team survey 6.22.24.docx(0.01)	Surveys and Questionnaires

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

Appendix B: Permission to Use Mentor Network Model

Re: request to use developmental network graphic

From Higgins, Monica C. <monica_higgins@gse.harvard.edu>
Date Sun 03/31/2024 06:02 PM
ToWanous, Christine Elizabeth <wanousc19@students.ecu.edu>

Hi Christine,

Nice to hear about your interests and thanks for asking.

As for the diagram, yes, you may use it (I am cc'ing Kathy Kram but bet she will be fine with this – want her to be aware, however) with that citation. Just make sure the full citation is there when you say "adapted from." You can also give the page number (think it's p. 270, but pls check).

Tie strength can be captured by emotional closeness and/or frequency of communication. I have attached one paper from a long time ago (2006) that has what we used in this one paper to measure those two aspects of strength. I am sure there are much more updated papers, but basically, we pulled from social networks research.

Hope this is helpful and pls keep us posted! We'd love to learn what you find out.

All best,
Monica

Monica C. Higgins
Kathleen McCartney Professor of Education Leadership
Harvard Graduate School of Education
| she/her/hers |
Office: 425 Gutman Library, 6 Appian Way, Cambridge, MA 02138
Voice: (617) 496-8826
Zoom: bit.ly/MonicaHigginsZoom
Podcast: bit.ly/a608afterhours

Faculty Coordinator: Kit von Campe
kit_voncampe@gse.harvard.edu

From: Wanous, Christine Elizabeth <wanousc19@students.ecu.edu>
Date: Saturday, March 30, 2024 at 12:06 PM
To: Higgins, Monica C. <monica_higgins@gse.harvard.edu>
Subject: request to use developmental network graphic

Hello Dr. Higgins:

First of all, I want to tell you that I am a fan of your mentoring and developmental network work and have appreciated yours and Dr. Kram's work on mentoring. I am working professionally and academically to bring more mentoring experiences to the public health workforce as I see the value for support and enrichment for public health employees.

I am a graduate student at East Carolina University working on my Doctor of Public Health degree. I am preparing my dissertation work on how mentoring is associated with public health nurse retention. I am intrigued with your developmental network research and will include assessing how public health nurses' network type may change their intent to stay with their employers. One of my research questions is : Is the retention rate different for public health nurses with a traditional mentorship network pattern (strong internal agency mentor relationships) compared to those with other types of mentorship network patterns?

I have a couple questions for you please:

1. May I please use a graphic in my dissertation that visualizes your 4 network types and highlights which you thought would impact employee retention? I would like to show a version like this:

Figure 1.

Traditional Developmental Network Strong mentorship ties AND in same organization as mentor(s) ***Most likely to stay***	**Receptive** Developmental Network Weak mentorship ties AND in same organization as mentor(s)
Entrepreneurial Developmental Network Strong mentorship ties AND in different organizations than mentor(s) ***Least likely to stay***	**Opportunistic** Developmental Network Weak mentorship ties AND in different organizations than mentor(s)

From Higgins & Kram (2001)

2. Do you have any suggestions for what survey questions would accurately capture tie strength? In your research you mentioned that tie strength is composed of emotional connection, mutual benefit, and communication frequency. Any ideas you have would be appreciated.

Thank you for your contributions to mentorship understanding and promotion. Let me

know if you have any suggestions or questions for me and if I may use the graphic.

Sincerely,
Christine Wanous, RN, BSN, MPH and doctoral candidate for DrPH

Appendix C: Permission to Use MFQ-9 Tool with Adaptations

Re: request to use the MFQ-9 in my dissertation with modifications

---

From Stephanie Castro <scastro@fau.edu>
Date Thu 10/10/2024 11:45 AM
To Wanous, Christine Elizabeth <wanousc19@students.ecu.edu>; scandura@miami.edu <scandura@miami.edu>

Hi Christine,
You have our permission!
If you are willing to share your results, we'd be grateful. I'm actually working on a meta analysis right now, and would like to include your study results if relevant.
Sincerely,
Stephanie

****
Stephanie L. Castro, PhD
Management Programs
College of Business
Florida Atlantic University
3200 College Ave
Davie, FL 33314
(954) 236-1350
(954) 236-1298 fax

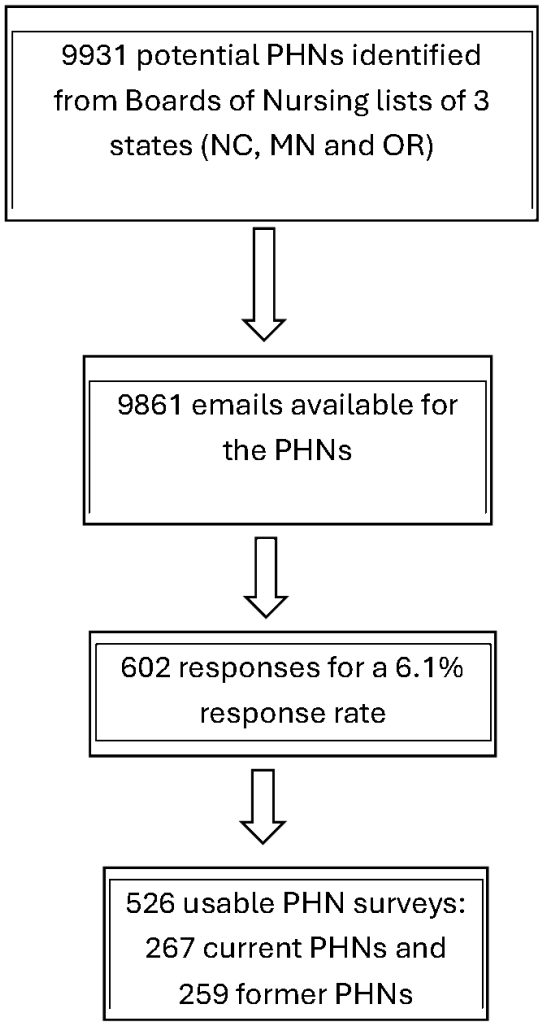
From: Wanous, Christine Elizabeth <wanousc19@students.ecu.edu>
Sent: Tuesday, October 8, 2024 7:53 PM
To: Stephanie Castro <scastro@fau.edu>; scandura@miami.edu <scandura@miami.edu>
Subject: Re: request to use the MFQ-9 in my dissertation with modifications

Hello Drs. Castro and Scandura:
First, let me express my hope that you and your families will be safe from the next hurricane that is headed to Florida this week.
Second, I have used your MFQ-9 tool to measure mentorships and supervisor relationships of current and former public health nurses. Before writing my findings and publishing my dissertation, I want to request your permission to do so. I have a ached a document that shows how I changed the tense for former public health nurses and for supervisors. Could I please have your permission to proceed with its use in my research? The results were quite remarkable for supervisors- how much being a mentor-like supervisor can help retention.
I eagerly await your response.
Thanks, Christine Wanous RN, BSN, MPH, DrPH student

Appendix D: Table 32: Current PHNs' MFQ-9 Answers for Primary Mentor and Retention P-Values

MFQ-9 Question	P-Value
My mentor takes a personal interest in my career.	0.8
My mentor helps me coordinate professional goals.	0.3
My mentor devotes special time and consideration to my career.	0.4
I share personal problems with my mentor.	0.3
I exchange confidences with my mentor.	0.2
I consider my mentor to be a friend.	0.3
I try to model my behavior after my mentor.	0.8
I admire my mentor's ability to motivate others.	0.9
I respect my mentor's ability to teach others.	0.5

Appendix E: Diagram of Public Health Nurse Recruitment Results



Appendix F: CEPH Competencies

DrPH Health Policy Administration and Leadership
Dissertation Approval Fom

All DrPH candidates must complete a minimum of 9-12 credit hours for PUBH 9000 (Dissertation) as partial fulfillment of the DrPH curriculum/program. The formal dissertation follows the guidelines and policies described by the ECU, Graduate School, and the ECU DrPH, HPAL Student Handbook, which has been approved by the Council on Education for Public Health (CEPH). As an applied, professional degree, it is critical that the DrPH dissertation place emphasis on field-based, research products that are consistent with advanced practices designed to inform and influence programs, policies and/or systems addressing public health.

As part of the dissertation, it is important that the student address the following.

- Demonstrate outstanding knowledge and understanding of the subject area; clearly and comprehensibly describe the design and methods; clearly interpret the research findings and limitations; and clearly articulate original and innovative ideas about the usefulness of the research study 's findings to public health.
- Students must demonstrate synthesis of a minimum of four (4) DrPH Foundational Competencies and two (2) DrPH major program specific competencies through the dissertation work and final products.

The rubric at the bottom of this form is completed by each of the candidate 's committee members following the final dissertation submission and defense. The criteria provided in the rubric below are not the only criteria by which students are assessed. In addition to the dissertation proposal and final dissertation, the committee should consider the comprehensive assessment of the students' readiness for public health practice by having met the listed competencies. The student should familiarize themselves with the criteria herein to ensure successful completion of the DrPH dissertation requirement.

Students are required to submit a copy of this form upon submission of the dissertation proposal to the DrPH Program Director along with other required ECU Graduate documentation per the submission guidelines. Students should refer to the DrPH Dissertation Guidelines for more details.

*Please note that the completion of this form is part of CEPH accreditation requirements for DrPH program.

To be completed by the DrPH student:

Christine Wanous Student ID: B01291410 Major: HPAL

Course of PUBH 9000 Dissertation Research Completed Final Product: Dissertation Enrollment:

To be completed by DrPH student:

The DrPH dissertation must demonstrate synthesis of foundational and major competencies where the student produces a high-quality written professional product(s) that is an appropriate contribution to the field of public health, and their educational and professional goals. The DrPH competencies should be addressed in the spaces below and included as part of the dissertation product. This can be as a separate page of the dissertation.

List the 4 DrPH Foundational Competencies addressed in the dissertation.

1. Design a qualitative, quantitative, mixed methods, policy analysis or evaluation project to address a public health issue.
2. Integrate knowledge, approaches, methods, values and potential contributions from multiple professions and systems in addressing public health problems.

1. Propose human, fiscal and other resources to achieve a strategic goal.

4. Design a system-level intervention to address a public health issue.

List at least 2 HPAL, concentration competencies addressed in the dissertation.

I . Assess the vitality of a public health organization's human and fiscal resources.

1. Assess and enhance leadership skills (such as negotiation, mediation and collaboration empower organizations/communities to address challenging issues

To be completed by the DrPH student

Describe in 2 paragraphs (200 to 400 words) how the proposed dissertation synthesized the selected competencies above

The DrPH competencies addressed in this dissertation project included utilizing research and strategies from the disciplines of public health, nursing, social sciences and human resources to assess the effect of mentorship and leadership styles on the retention of public health nurses. Quantitative and qualitative methods were utilized to address the public health issue of public health nurse attrition and its effects on public health agencies and communities. The dissertation proposed interventions to improve the retention of public health nurses and re-recruitment of former public health nurses in the areas of mentorship program development, workplace environment improvements, and leadership training opportunities. The recommendations for these strategies to improve public health nurse retention could be implemented at the local, regional or state levels.

The HPAL specific competency of assessing public health human and fiscal resources were addressed in this dissertation through the literature review of research pertaining to public health nurse retention including the reasons for a reduced workforce, the financial and programmatic effects of public health nurse vacancies and turnover and the strategies that have been found to mitigate public health nurse attrition. Public health leadership capacity building, especially supervisory training to be mentor-like toward their employees, was found to be a promising strategy that agencies could pursue to improve nurse retention. How leaders' behaviors, such as offering support for public health nurse employees, influences

nurse retention was explored and discussed.

To be completed by each Dissertation Committee member (submit to Advisor when completed and Advisor should then forward to PD)

Successful completion of the final dissertation and defense requires that students score a minimum of "Sufficient (1) " on each criterion.

Evaluation of the Doctoral Dissertation and Defense

	Not Sufficient (0)	Sufficient (1)	Outstanding (2)	Score
Knowledge	Student did not sufficiently demonstrate	Student demonstrated sufficient	Student demonstrated	2
	knowledge and understanding of the area of study	knowledge and understanding of the area of study.	outstanding knowledge and understanding of the area of study.	
Design	Student did not sufficiently describe the design and	Student sufficiently described the	Student clearly and	1
	methods for their research-based study.	design and methods for their research-based study.	comprehensively described the design and methods for their research-based study.	
Interpretation of Results	Student did not sufficiently interpret research	Student sufficiently interpreted	Student clearly and concisely	1
	findings and limits of the study.	research findings and addresses limits of the study.	interpreted research findings and addresses limits of the study.	
Implications of Findings	Student did not sufficiently articulate original ideas	Student sufficiently articulated	Student clearly	1
	about the usefulness of the study's findings to public	original ideas about the usefulness of the study's findings to public health.	articulated original and innovative ideas about the usefulness of the study's findings to public health.	

Communication	Written and oral presentation does not meet formatting, grammatical and clarity expectations.	Written and oral presentation is sufficient. Student wrote with clarity and concision. Student did a good job delivering the oral presentation.	Dissertation was very well written and in the appropriate format. Student did an outstanding job delivering and defending during the oral presentation.	1
Evaluation of Competencies				
	Not Sufficient (0)	**Sufficient (1)**	**Outstanding (2)**	**Score**
CEPH Expectation for DrPH ILE Final Field Based Research Products	Student did not produce field-based research products consistent with advanced practice designed to influence programs, policies or systems addressing public health.	Student produced quality field-based research products that are consistent with advanced practice designed to influence programs, policies or systems addressing public health.	Student produced outstanding field-based research products consistent with advanced practice designed to influence programs, policies or systems addressing public health.	1
Synthesis of DrPH Foundational and Concentration-Specific Competencies	Student did not demonstrate synthesis of the selected *DrPH Foundational and Concentration Competencies.*	Student's demonstration of synthesis of the selected *DrPH Foundational and Concentration Competencies* was sufficient.	Student's demonstration of synthesis of the selected *DrPH Foundational and Concentration Competencies* was comprehensive.	2

Signature Page (initiated by student and routed by advisor)

Name of Student_Christine Wanous

Christine Wanous

Signed by: Christine Wanous B31CE4A05A8D45C... 4/15/2025 | 7:30 PM EDT

Student Name (full), Printed

Student, Signature Date

DocuSigned by: Rashmita Basu 011786FB6AE4462... 4/16/2025 | 9:56 AM EDT

Dr. Rashmita Basu

Dissertation Advisor Name, Printed

Faculty Advisor (if different than dissertation advisor),

Dissertation Advisor, Signature Date

Faculty Advisor (if different than Dissertation advisor), Signature Date

Dr. Ruth Little

different than dissertation advisor), Signature

Dr. Ruth Little 4

Program Director

Name, Dr. Ruth Little

Printed

Signature Program Director, Signature Date

Submit documents with signatures to the DrPH, HPAL Program Director