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# Correlational Impact of Workload, Teamwork and Retention Rate for Clinical Nursing Units

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Correlational Impact of Workload, Teamwork and
Retention Rate for Clinical Nursing Units


by


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**Abstract**

Healthcare organizations face an impending shortage of over one million nurses. Staff turnover adds costs to healthcare and decreases the morale of the unit. Teamwork has been shown to be related to engagement as engagement has been shown to be related to retention. Understanding how teamwork mitigates increasing workload at the unit level is critical to reducing turnover at the nursing unit level. This research explored relationships between teamwork and productivity and teamwork and retention rates for nurses. The Neuman Systems Model was used as the framework to guide this retrospective correlational analysis with teamwork as a flexible line of defense protecting nurse retention against the stress of increasing workload. Results indicates that teamwork was a relating factor but did not significantly correlate to productivity or retention rates directly. Of important note, units with lower productivity tended to have a stronger association with teamwork and retention rates.

*Keywords*: teamwork, productivity, retention, engagement, turnover, work environment, workload

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**CHAPTER I**

**Introduction**

The healthcare organization is a complex system designed to care for the patient.

Nurses represent the largest segment in the healthcare organization's workforce and are

directly responsible for the care of the patient. Healthcare organizations are impacted by

internal and external stressors, which affect the ability of the organization to achieve the

mission, express the vision, and demonstrate the values through care for the individual

patient and the affected population. The healthcare organization's ability to maintain an

equilibrium state of health is dependent upon the health of the nurse workforce, which

includes the subcomponent divisions, departments, units, and ultimately, the individual

nurse.

**Problem Statement**

The American Nurses Association (ANA) (2018) reports an estimated 1.1 million

nurse shortage by 2022. This is a combination of over 500,000 nurses expected to retire

and nearly 600,000 new nurses needed to care for the baby boomer generation (ANA,

2018). Understanding how to recruit, motivate, and retain talented nurses is a critical

element for the healthcare organization (HCO) as they enact strategic initiatives to reach

their mission and vision. Organization culture is a direct reflection of the value the HCO

places on the nursing workforce. Organization culture is often assessed in yearly

employee engagement surveys and is described in terms of teamwork (interdepartmental

or intradepartmental) and organizational pride. The work environment is a complex factor

that contributes to the collaboration between nurses within each nursing unit. Reduction

in reimbursement rates and increasing workload place pressure on the nurses to provide

more interventions to improve outcomes, while nurse to patient ratios generally remain constant at the unit level. Understanding the impact of the increased workload is critical to creating a collaborative environment and retaining quality nurses to care for patients.

<div align="center">**Significance**</div>

The Institute for Healthcare Improvement's (IHI) Triple Aim Initiative seeks optimization of healthcare by simultaneously pursuing improvement in the patient's experience of care and the health of populations while reducing per capita cost (IHI, 2018). This is a robust goal that provides accountability for organizations to drive healthcare reform. These goals touch the nurse's workflow at the core. The nurse's responsibility is to care for patients within the nursing scope of practice and in accordance with the policies and procedures of respective organizations. William Kissick's famed "iron triangle of healthcare" of cost, quality, and access shows the dilemma in balancing infinite needs versus finite resources Kissick (1994). Demand increases for nursing interventions and nurses are expected to do more with less.

The Robert Wood Johnson Foundation Committee in The Institute of Medicine's (IOM) (2010) report The Future of Nursing: Leading Change, Advancing Health, makes several recommendations to support engagement of nurses to support retention. A strong recommendation to improve outcomes is nurse residency programs to better prepare competent nurses. Additionally, leadership and collaboration were cited several times as keys to engaging nurses in the work of the organization to improve patient care and outcomes (IOM, 2010). Nurses must not only be engaged in practice but engaged in the mission of the organization for the goals of the Triple Aim to be realized through healthcare reform. Doing more with less is the stark reality of the bedside nurse in the era

of healthcare reform – quality standards and technical excellence are expected quickly and at the lowest cost. At the healthcare unit level, nurses have multiple levels of responsibility. Nurses care for individual patients, as well as ensure the operational effectiveness of the unit to support patient care. The collaboration among the nurses within the unit creates the work environment.

## Purpose

The purpose of this research was to explore relationships between teamwork and productivity, and teamwork and retention rates for nurses. Healthcare leaders have been tasked to provide better outcomes and patient experiences at a lower cost. The ability of the healthcare organization to meet expectations and remain a viable organization depends on maintaining a healthy nursing workforce. Increasing quality demands, better outcomes, and satisfied patients require a nursing workforce engaged in the organization's mission and vision. Teamwork represents a flexible line of defense that protects the nurses and the organization from the stresses of varying workload in the work environment. As the demand for nursing resources increases, teamwork increases to allow nurses to meet the increased workload. At a certain point, the workload breaches this line of defense and nurses will decrease teamwork or leave the organization.

## Theoretical or Conceptual Framework

The Neuman Systems Model, by Betty Neuman, was the theoretical framework that guides this research. The Neuman Systems Model is a holistic Gestalt theory based on the principal of the whole being greater than the sum of its parts. There is equilibrium flux between the balance and imbalance of the client system. This theory has been used in

community and populations settings and is particularly useful in describing the impact of stressors upon the normal level of health of the client.

The model adheres to the nursing metaparadigm concepts of nursing, person, environment, and health (Neuman & Fawcett, 2002). While Neuman originally used the model to describe the patient as the system, this study focused on the HCO as an open client system interacting with the environment and moving along the health continuum. The open system of the HCO is representation of the nursing workforce as people and the nurse leadership, as the nurse completes the expression of the metaparadigm at the organizational level.

The phenomenon of nursing is directly focused on nurse executive leadership and what interventions will be used as primary, secondary, and tertiary levels of prevention to reconstitute the system as the stressors attack the flexible line of defense (FLD) and the normal line of defense (NLD). In the model, the person metaparadigm is the client system that receives both the stressors and the prevention strategies. In the same vein that nurses deliver care to patients to move them to a higher level on the health continuum, the nurse leadership will deliver care to improve, or protect, the nurse workforce's health level. The health of the nursing workforce describes the health of the organization in terms of the ability to execute the mission and vision through care delivery according to the values of the organization. The health of the nursing discipline of an organization is measured by the level of engagement of the employees to the mission, vision, and values by retention rates. The environment represents both internal, external, and created (social) stressors that impact the health paradigm of the nursing workforce.

At the core of the Neuman Systems Model lies the basic survival mechanisms of the client system's nursing workforce (See Figure 1). These concepts are physiological, psychological, sociocultural, developmental, and spiritual in nature. These concepts represent the organizational culture of the nursing workforce. Each of these variables apply and are impacted by the stressors and reconstituted by the prevention strategies. The NLD is the usual level of health of the nursing workforce – represented by the baseline engagement and retention rates. The FLD protects the NLD from stressors – these are the leadership strategies that nurse leaders use to maintain the NLD.

For the purposes of this research the variables focused on leadership's effect on the teamwork and retention of the nursing workforce. Engagement is a function of teamwork and organizational pride. Normal retention (turnover) rates will decrease (increase) if the stressor workload breaks through the FLD and disturbs this normal line of defense. The FLD represents the teamwork of unit that is used to combat increased workload as represented by the productivity of the unit.

**Figure 1**

*Neuman Systems Model of Nursing Workforce*
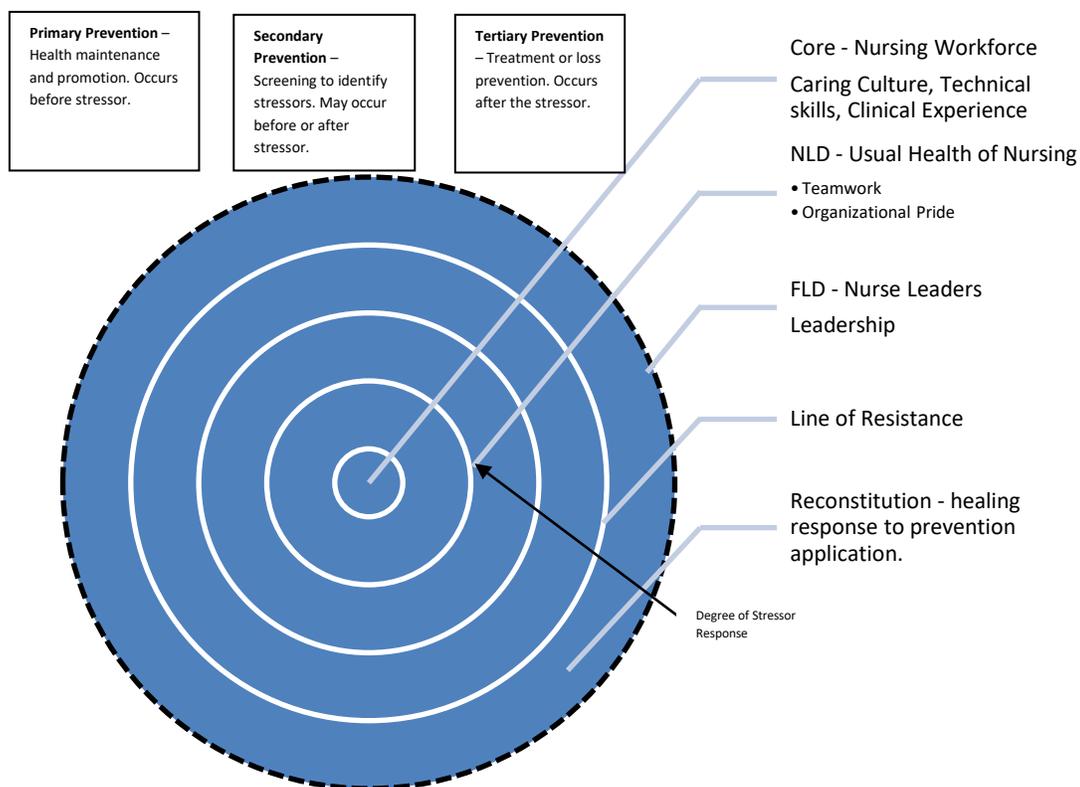


**Thesis Questions and Hypothesis**

The aim of this research was to determine if teamwork was a mediating factor in the productivity and retention rates at the individual unit level by asking the following questions.

1. Is there a correlation between the perception of teamwork (RN: RN collaboration) and the productivity of the unit as measured by the worked hour per unit statistic which varies based on budgeted staffed workload for the unit?

2. Is there a correlation between the perception of teamwork (RN: RN collaboration) and the retention rates for registered nurses?

The hypothesis was that teamwork is a mediating factor in both relationships and there will be a direct relationship between teamwork and productivity and teamwork and retention.

**Definition of Terms**

Teamwork is representative of the self-reported degree of nurse to nurse collaboration within the nursing units for the purposes of this study. Teamwork is the independent variable in this study. The dependent variables are retention rates and productivity. Turnover rates were used to calculate the retention rates for this study. Subtracting the turnover rate for a unit from one yields the retention rate which was then converted to a percentage for analysis. Productivity represents a measure of workload of the nurse for any give shift and varies by unit based on the unit's base statistic. For most inpatient and observation units, the base statistic is average daily census. For emergency departments and procedural nursing areas, the base statistic is average number of patients presenting or number of procedures performed respectively. When budgeted worked hours per unit statistic is compared to actual worked hours per unit statistic, the calculated percentage represents the dependent variable of productivity and is standard across nursing units.

**CHAPTER II**

**Literature Review**

There has been much nursing research on teamwork and nurse engagement. Most of the existing research has been based on the determinants of teamwork or characteristics and behaviors that drive nurse engagement, and therefore retention. As such, there has not be significant research conducted to directly relate teamwork, engagement, or retention directly to the workload characteristics of the work environment. As such, this literature review has been structured according to the research available related to the variables of concern and their constituents: teamwork and engagement, retention and turnover, and productivity and work environment.

Beginning a literature review in this area began with a list of keywords to search the various online databases containing the research articles and publications. Initial keywords identified for searching included: *teamwork*, *engagement workload,* and *turnover*. These three keywords returned thousands of articles across a range of content types and disciplines. Specifically, the discipline of nursing is the most relevant area of research and the content type was limited to nursing journals, nursing research published within the last 10 years in order use the most current research studies, and to reflect the modern theories and processes in a rapidly changing industry such as healthcare. This narrowed the search to 600 articles. Abstracts were reviewed to exclude articles that were specific to an episode of care or a specific process such as "teamwork during cardiac arrest." Research limited to clinics, physician practices, and healthcare organizations without a hospital were also excluded from the search, as these organizations do not contain the traditional mix of bedside nurses and nurse leadership that this study focused

on as a representative sample. Additional keywords were added: organization culture, fulfillment, staff engagement, productivity, workplace health, creating healthy environment, and building organizational culture. These searches were then filtered including scholarly nursing publications written in English language. One hundred and forty-seven articles were included in the resulting search. Twenty-seven articles were selected based on title for abstract review, with 20 selected for inclusion in this literature review.

**Teamwork and Engagement**

Brunetto et al. (2013) examined the relationships between supervisor-staff relationships, teamwork and wellbeing have on commitment to the organization, and intent to leave the organization in North American nurses in a cross-sectional design study. The study also allowed for generational differences and measured the effects on the hypotheses. Roughly half of the nurse's commitment to the organization and intention were accounted for in supervisor-supervisee and colleague-colleague relationships along with the perception of teamwork and wellbeing in the work environment (Brunetto et al., 2013). The baby boomer cohort (1946-1965) experienced the lowest intention to leave, followed by Gen Y (1965-1980) and then Gen X (1980-2000) with the highest intent to turnover.

Leadership attributes and the engagement responses were examined through a cross sectional study of supervisor nurse relationships by Andrews et al. (2012) to determine if a linkage existed. However, the interpretation of the leadership attribute was often different than intended. The multifactor leadership questionnaire form 5x is accepted as a reliable tool, Cronbach's $\alpha$ .74 to .96. Validity was confirmed for each

subscale by factor analysis (GFI .92, AFGI .91, CFI .91 RMSEA .05). Staff nurses were asked to rate their direct supervisor on leadership according the scale, and the leader was also asked to self-rate using the scale. There was a strong inverse relationship of satisfaction in leadership over-estimation. Supervisors that rated their leadership skills more positively than their employees were associated with lower levels of satisfaction with leadership (Andrews et al., 2012). This discrepancy also highlighted the preference of staff for the transformational leadership style as a more motivational leader. Assistant nurse managers were also viewed as less transformational (more transactional) and were consistently rated with less satisfaction. The interactions between the assistant nurse manager and the staff were viewed as transactional or authoritative, more than higher level administrators that were less involved but lead by consensus.

Leadership has been noted as a key element to effective engagement and subsequent retention. Lopez et al. (2012) validated this by identifying a leadership gap on night shift on a unit at the City of Hope National Medical Center.  Four strategies were used to improve staff satisfaction and were used the annual engagement survey: management visibility, 1:1 meeting(s) with staff focusing on unit goals, professional development, and spot recognition, rounding to create a connection between staff and leadership goals and shared governance. After adding a night shift assistant nurse manager, the unit ratings were significantly increased in their eight key drivers of engagement. The study showed that leadership visibility and focus on setting staff up for success led to trust and commitment to organization and its goals.

Hilton and Sherman (2015) discussed a journey promoting engagement of St. Lucie Medical Center from 2000 to 2015. The initial focus was on placing employee

engagement at the center of the vision statement acknowledging that engaged employees drive customer care, quality care, and cost-effective care. This was accomplished by establishing processes to hire for talent, achieve cultural competency, and provide staff recognition and rewards. Within one year, the organization ranked as the highest organization on the Gallup Employee Engagement Survey. In 2007, leadership continued the effort by creating four work groups to raise HCAHPS scores to reflect SLMC's care which was "better than a C." The groups focused on creating a new mission statement and logo, staff huddles to connect to purpose, restructuring leadership rounding, and beginning engagement at the interview and hiring processes. Hilton and Sherman (2015) concluded that by creating a culture where the organization engages the employee in the mission and by seeking to fulfill the needs of the employee in terms of trust, recognition, job security, identification, and connection with the organization the staff will be engaged to provide quality, safe, cost effective care.

A systematic review of nurse work engagement by Keyko et al. (2016) utilized the Job Demands-Resources Model, reviewed 18 studies, and organized data into six themes: organizational climate, job resources, professional resources, personal resources, job demands, and demographic variables. A key result was that work engagement was fully mediated by trust in the manager. Specifically, key factors for trust in the manager included: created a shared vision among staff and controlled workload to create community. Other factors included rewards and shared values and fairness. Keyko et al. (2016) acknowledged that the HCO was facing pressure to reduce cost and increase quality in the face of a global nursing shortage and must focus on work engagement in the profession practice. Keyko et al. (2016) did not expressly describe this as teamwork,

but the implication was that nursing as a discipline at the organizational and individual levels must rise to face this challenge.

An exploration of the influences of unit and staff characteristics and teamwork on job satisfaction was performed by Kalisch et al. (2010) in a cross-sectional study of 3,765 nurses from 80 nursing units over five hospitals. Current job and occupation satisfaction were directly correlated with high levels of teamwork ($p < 0.001$) and perception of adequate staffing ($p < 0.001$) (2010). The Nursing Teamwork Study (NTS) was utilized as the survey instrument with a reliability coefficient of 0.92 with an internal consistency rating of 0.94. Key elements of this study showed that nurses that cared for a higher number of patients reported less satisfaction ($p < 0.05$) with the current position while staff with a perception of adequate staff had a higher satisfaction with current position ($p < 0.001$). Kalisch et al. (2010) cited the need for future research in the determinates of perception of adequate staffing.

In a systematic review of the importance of teamwork to the healthcare organization, Kossaify et al. (2017) analyzed 248 articles and ultimately reviewed 33 papers for relevant factors of teamwork that influenced the quality of care. The works reviewed included 13 review papers, 18 original research works, one case report, and one original commentary. Common themes of work environment, ethics, leadership communication, cooperation, competitiveness, monitoring and management of teamwork, and director roles (medical and nursing) emerged (Kossaify et al., 2017). Of critical note, the nursing directors' control over staffing was identified as an important issue leading to variability in work environment and leading to inconsistent distribution of resources (nursing). This led to greater workload per nurse or per unit based on census and patient

type, and directly linked to teamwork within the unit. The implication was that increased teamwork led to efficiency gains and therefore reducing workload.

**Retention and Turnover**

Inability to retain nurses leads to vacancy rates, job dissatisfaction among nurses, and over-inflated productivity metrics. Quetsch and Kim (2006) discussed the outcomes of creating a culture to improve retention among nurses. By survey, the staff identified the top five significant contributors to staff dissatisfaction as: limited management availability, inconsistent communication, inflexible scheduling, poor staff involvement in decision making, and lack of staff recognition. Two additional patterns emerged as educational needs: conflict resolution and cross-generational awareness. The goals were (1) create a process for staff involvement in the new graduate nurse hiring process and (2) train new graduate nurses through immersion in the operating room culture. By strengthening the orientation program with didactic training, they can incorporate additional training around culture awareness and conflict resolution. This led to a decrease in vacancy rate from 61 days to zero and decreased vacancy rate from 3% to 0% during the next year. Although the study was based on retention being a sole determinant of engagement, the implication was that culture begins at onboarding and is fortified by leadership availability and creating an environment where staff can affect change on processes and resolve conflict in a collaborative fashion.

Measuring nurse intent to remain employed within the organization is a key leading indicator for retention. Tourangeau and Cranley (2006) performed a descriptive design study surveying over 13,000 Ontario nurses to analyze the determinants of nurse intention to remain employed in their current hospital. Nurse reported level of teamwork

was used as an indicator for work group cohesion. The Maslach Burnout Inventory

(MBI), the Revised Nursing Work Index (NWI-R), and the McCloskey Mueller

Satisfaction Scale (MMSS) each with established reliability and validity were used.

Through multiple regression, Tourangeau and Cranley (2006) reported four of the six

hypothesized determinants were statistically significant predictors of intent to remain.

Organizational commitment, job satisfaction, work group cohesion, and personal

characteristics of the nurse were deemed statistically significant whereas burnout and

manager ability and support were found to be statistically insignificant by the regression.

Teamwork as a predictor r = .028, $p$ = .015, was cited as a predictor or intent to remain.

While the study was limited by the fact that the regression only showed that the tested

variables explained only 34% ($p < .001$) of the variance, this evidence did support

previous studies cited by Tourangeau and Cranley (2006), particularly related to

teamwork and retention as measured by intent to remain employed.

A mixed method study by Van den Heed, Florquin et al. (2013) investigated

strategies for nurse retention in acute hospitals using a structured survey with regression

analysis along with interviews with chief nursing officers in 56 hospitals in Belgium.

Work environment was measured by the Practice Environment Scale of the Nursing

Work Index (PES-NWI). This instrument has established reliability and validity

(Cronbach's alpha 0.71-0.84) and was widely accepted and endorsed by the United States

National Quality Forum. Van den Heede et al. (2013) sought to connect the dimensions

of nurse staffing, work environment directly with retention (turnover), as represented by

intention to leave the hospital. Statistical significance ($p < 0.03$) was observed in between

higher nurse to patient ratios and greater intent to the leave the hospital. Furthermore,

lower reporting ratings of quality of work environment were associated with intent to leave the hospital with statistical significance ($p < 0.001$). The Van den Heede et al. (2013) concluded that nurse staffing and quality of work environment were significantly associated with turnover (intent to leave). The basis for nurse staffing measurement was the stated nurse to patient ratio for the unit, not the actual working ratios for the unit which is subject to shift variability.

California legislation passed in 1999 to mandated nurse-to-patient ratios with the intent of improved patient outcomes, decreasing mortality and failure to rescue rates, and improving job satisfaction and burnout among nurses. Aiken et al. (2002) sought to determine an association between the patient outcomes of mortality, failure to rescue among surgical patients, and the nurse reported outcomes of job dissatisfaction and burnout. Aiken et al. (2002) considered job dissatisfaction and burnout as factors in nurse retention. Hospital data was collected from the 1999 AHA Annual Survey and the 1999 Pennsylvania Department of Health Hospital Survey. Nurse data was acquired through a survey of all nurses from the Pennsylvania nursing board that were mailed a completed Maslach Burnout Inventory, which is a standard tool with accepted reliability and validity. Patient outcome data was gathered from the Pennsylvania Health Care Cost Containment Council. Cross-section descriptive study methodology was used with regression along with correlational statistics. Aiken et al. (2002) determined a strong and statistically significant relationship between emotional exhaustion ($p < .001$), job dissatisfaction ($p = .004$), and higher patient to nurse ratios. When adjusted for hospital characteristics there was a slight increase in the strength of association ($p < .001$) for both measures. The associations with mortality and failure to rescue produced similar results.

Aiken et al. (2002) further suggested that a controlled workload through patient to nurse ratio, in a similar fashion to California, could lead to improvement in not only patient outcomes (mortality, failure to rescue) but nurse outcomes leading to improved retention and lower emotional exhaustion (burnout).

Collini et al. (2015) conducted research to determine the mediating effects of interpersonal relationships with engagement and turnover in a descriptive cross-sectional study. The HR Solutions Sweet 16 employee engagement survey was utilized with internal consistency measure reported at 0.73 for the interpersonal relationship research question. Interpersonal relationships were assessed based on perceived level of respect in the workplace from coworker, supervisor, senior leaders, and physicians. Collini et al. (2015) reported that engagement fully mediates the relationship between respectful interpersonal relationships and turnover (p <0.05). A further implication was the opposite effect for units where interpersonal relationships suffer and tend to have lower level of engagement which leads to lower retention rates and higher turnover.

Hayward et al. (2016) performed a qualitative interpretive descriptive analysis of 16 rich contextual interviews with direct patient care RNs to gain a better understanding of the factors that contributed to their decision to leave a position. Three inter-related factors led to decision to leave: challenging workplace environments, limited leadership support, and personal health issues were identified. These three factors were noted to contain subthemes of poor teamwork and collaboration by the staff leading to burnout and overwhelming stress. Within the limited leadership support theme, a decision to leave was based on leaderships inability to foster and grow an environment of communication and teamwork leading directly to reduced excellence in patient care (Hayward et al.,

2016). Hayward et al. (2016) concluded that mental fatigue and burnout were the most common feelings expressed as a result of the practice setting factors that resulted in the decision of nurses to leave a position. The implication was that working team relationships create a healthy working environment and were critical to fostering engagement and retention of nurses.

**Productivity and Work Environment**

Yanchus et al. (2017) performed a qualitative analysis of data collected during interviews from the Veteran's Health Administration (VHA) nursing units during a workplace assessment. This data from 271 units was quantified and reviewed for themes from the nursing and assistant staff related to effects of workload and staffing. Workload was defined as the intensity level of patient dependency, amount of direct/indirect patient care, nursing care time, severity of illness, and complexity of skill mix (Yanchus et al., 2017). Teamwork, staffing, and workload were identified as interrelated concepts wherein teamwork was the ability of staff to overcome inadequate staffing or inability to meet the needs of severely acute patients. There was a consistent linkage between the concepts and future research which was recommended to gauge the affect the engagement of nurses. When staffing ratios were controlled, a statistically significant correlation between mentions of teamwork ($p < .05$) and workload ($p < .05$) were noted when positively mentioned as a strength and when negatively mentioned as a weakness. Yanchus et al. (2017) concluded that this underscores the closeness of nurse's perception of these elements of workload.

Perception of workload was closely related to the nurse's ability to manage and adapt to their practice environment. Van Bogaert et al. (2014) investigated the impact of

nurse practice environment, work characteristics and burnout on the reported job outcomes, quality of care, and adverse events (patient) in a cross-sectional survey of 1,108 nurses in 96 units using a compiled survey of multiple instruments. Each of the subscales utilized were referenced as both valid and reliable tools with citations from the originators. The results indicated workload, hospital management and support, and nursing management were positive predictors of perceived quality of care ($p < .001$). They concluded that work force stability with a perceived ability to provide quality care and achieve quality outcomes were associated with positive perceptions of the work environment. Leadership at the unit and organizational levels shared a responsibility to create such an environment and this directly impacted the nurse's perceived quality of care.

Much of the research in nurse productivity focused on factors and tasks related to direct patient care. Some research has been conducted in non-direct patient care factors and their contribution to the overall workload of the nurse. The overall workload of the nurse must be considered as part of their overall productivity and work environment. Myny et al. (2011) performed an integrative review study of 30 publications addressing these factors from 1970 to present in PubMed, Embase, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), among others and classified their result in a cause and effect relationship. Of note, was the practical implication of the importance of the degree of good teamwork as an element that affected the determination of the workload at the unit level. The nursing team itself and its ability to function collaboratively and effectively impacted the workload of the individual nurse and patient, as well and the unit and patient population. Using a conceptual model based in systems

theory Myny et al. (2011) concluded that both direct and indirect patient care factors should be included in attempting to measure the workload in the nursing environment. Myny et al. (2011) observed a critical limitation in that 26 of 30 articles did not define workload, which underscores the lack of a standard definition for workload in general. This was problematic when assessing workload across different units and organizations.

Intention to leave the organization has been associated with quality of the work environment. Kutney-Lee et al. (2012) utilized a retrospective, two-stage panel descriptive panel study to associate improvements to the work environment and reductions in intention to leave. In the survey panel the Maslach Burnout Inventory (MBI) and the Practice Environment Scale of the Nursing Work Index (PES-NWI) were utilized. Established reliability and validity were noted for both instruments. The American Hospital Association (AHA) annual survey was utilized to measure the data points of the hospital to account for the structural characteristics of the hospitals. Kutney-Lee et al. (2012) found that improvements in work environment were associated with improvement in burnout rates ($p < .01$), intention to leave ($p < .01$), and job dissatisfaction ($p < .01$). They further concluded that nurse staffing levels were a contributor to work environment and that work environment was a strong predictor of job outcomes – in the form of retention.

Twigg et al. (2014) performed a systematic review of literature to determine the cost effectiveness of increasing nurse staffing or changing the nursing skill mix in adult medical and/or surgical patients. This review paper analyzed four cost-benefit and five cost-effectiveness studies conducted on alterations to the nurse's work environment. This review was conducted from an economic perspective to determine if the cost of

increasing nurse staffing was offset by improved outcomes. Staffing level is a significant component of the nurse's work environment and speaks directly to the productivity metrics of the nursing unit. The study was not able to conclusively determine if increased staffing was a cost-effective intervention for improving outcomes. However, of note was a positive societal impact by increasing RN hours or increasing skill mix. There were limited findings showing that this relationship was positive, although non-linear, and did lead to improved outcomes for patients with an improved work environment focused on patient care.

Workload and work environment are elements that tend to vary among research and organizations which adds to the difficulty of generalizing findings. Swiger et al. (2016) conducted a concept analysis to better understand and define nursing workload in the acute care setting. The aim was to understand the complex elements of workload in direct patient care and indirect elements of patient care. Using search terms "nursing workload," "workload measurement," and "workload and patient safety" in literature searches in PubMed and CINAHL resulted in 228 and 93 articles respectively. Ultimately, 21 publications were included in the concept analysis using Rogers' Evolutionary Method. Articles were then sorted into four categories: workload, definitions, workload measurement, factors influencing nursing workload or classification of how nurses spend their time. After completion of analysis, a proposed definition of nursing workload was the amount of time and physical and/or cognitive effort required to accomplish direct patient care, indirect patient care, and non-patient care activities (Swiger et al., 2016). Several reviewed research studies noted that up to

40% of the nurse's day is consumed by indirect and non-patient care activities which cannot be accounted for in simple nurse to patient staffing grids.

MacPhee et al. (2017) conducted a cross-sectional correlational study examining the Canadian nurse's perception of work environment, quality of nursing care, patient outcomes, and nurse outcomes. The sample was medical, surgical, and medical-surgical direct patient care nurses from four of the largest health authorities in British Columbia, Canada. A response rate of 22.4% was observed with 354 registered nurse and 118 licensed practical nurses responding. One research question sought to determine the relationships between perceptions of heavy perceived nurse workload, interruptions to workflow, nursing tasks left undone, and compromised professional nursing standards and nurses' (a) emotional exhaustion; and (b) job satisfaction after accounting for individual characteristics, RN staffing levels, and patient acuity and patient dependency. Patient to nurse ratio was used to represent RN staffing levels while perceptions of workload were measured from the Canadian National Survey on the Work and Health of Nurses which has establish reliability and validity. In response to (a) nurses that reported heavy workloads frequently were three and a half times more likely to report high emotional exhaustion. Furthermore, heavy workloads, frequent interruptions to workflow, leaving tasks undone, and compromised professional standards of practice were all independent predictors of emotional exhaustion. Analysis for (b) showed that leaving nursing tasks undone due to workload was significantly associated with decreased job satisfaction ($p < 0.001$), while perception of have workload and frequent interruptions were also independent predictors. Swiger et al. (2016) concluded that external demands of heavy workload, task interruptions, time pressures, and mental exertion negatively

impact nurse outcomes of emotional exhaustion and job satisfaction. Swiger et al. (2016) further differentiated between internal demands of mental concentration, problem-solving, and which make work more satisfying, and improves patient outcomes.

**Gaps in Research**

There has been a significant amount of research in the determinants of overall employee engagement that has revealed the perception of teamwork as a key element. Engagement has been clearly shown through multiple studies to be a key driver of nurse retention. Research on the work environment has shown a link between leadership styles creating enhanced cultures of safety, communication, and efficiency which has in turn positively affected the outcomes of the patient and the connectedness of the nurse to the organization.

Gaps in the research included the connection with the workload of nurses outside of the nurse to patient ratio. Nurse to patient ratios are often set by the nursing leadership in the policy to reflect the average patient type; however, this does not take into consideration the normal ebb and flow of the unit or the unit-based administrative tasks that must be performed by nursing staff to ensure a functional department. Nurse to patient ratios are not directly reflected in the budgeting process or how nurse managers must construct or monitor work. Productivity is the ultimate measure for the unit manager. Productivity is often budgeted and measured according to the worked hour per unit statistic of the unit for variance analysis to budget per month, quarter, and year. Unit statistics can vary according to the setting and often include average daily census, patient days, emergency department visits, operating room cases, or procedure counts. This productivity measurement more accurately reflects the output of the unit over a longer

term than does an average nurse to patient ratio. Variance from the work hour per unit stat can show the impact of surges in patient volume or significant increases in patient acuity over the periods of time.

Research was not found that connected the actual worked hours need to care for the total patients in reference to teamwork or retention. A true productivity level considers administrative and training time that employees are responsible for completing within their allotted shift work. This time is not a direct value add proposition to the patient, but directly affects the time capacity the nurse must perform the patient care tasks.

**CHAPTER III**

**Methodology**

The purpose of this research was the exploration of relationships between teamwork and productivity, and teamwork and retention rates for nurses. Healthcare leaders have been tasked to provide better outcomes and patient experiences at a lower cost. The ability of the healthcare organization to meet expectations and remain a viable organization depends on maintaining a healthy nursing workforce. Increasing quality demands, better outcomes, and satisfied patients require a nursing workforce engaged in the organization's mission and vision. Teamwork represents a flexible line of defense that protects the nurses and the organization from the stresses of varying workload in the work environment. As the demand for nursing resources increases, teamwork increases to allow nurses to meet the increased workload. At a certain point, the workload breaches this line of defense and nurses will decrease teamwork or leave the organization.

**Study Design**

This MSN thesis used a retrospective descriptive design to correlate relationships between teamwork and productivity, and teamwork and retention rates for nurses. Teamwork is measured by the nurses self-rating of nurse to nurse teamwork and collaboration within their department. Productivity is measured as the worked hour per unit for each unit represented by a percentage. For the purposes of this research, retention and turnover rates total to 100 %.

**Setting and Sample**

Retrospective data was utilized from a medium-sized acute care hospital in the Southeast region of the United States. Professional Research Consultants Engagement survey data was collected by the organization from 2016, 2017, and 2018. From this survey the self-reported questions for nurse's perception of intra-departmental teamwork was gathered for each of the nursing units in the facility. The National Database for Nursing Quality Indicators (NDNQI) survey data was utilized to gather retention rates for the 2016, 2017, and 2018 years. Productivity data was gathered from the financial reports in terms of productivity per base unit statistic for each of the nursing units for the same periods. Although the base statistic varies from average daily census, cases, procedures, or visits, productivity is represented as a percentage of worked nursing hours per unit and can therefore be compared among the units. Data was available from 33 nursing units. Fifteen units were excluded for incomplete data sets. Eighteen units had complete data sets for each of the three years.

**Design for Data Collection**

Data was made available by the NDNQI site coordinator at the research location. This data consisted of aggregated and de-identified department level data from each of the 39 nursing units. NDNQI survey data from 2016, 2017, and 2018 was utilized referencing self-reported RN-RN Teamwork and Collaboration satisfaction rates. Aggregated and de-identified departmental retention and turnover data was also provided for each of the units for 2016, 2017, and 2018. Departmental aggregated and de-identified productivity data was made available by the finance department of the hospital through existing data used for productivity and budgeting purposes. This data was kept in a secure

location on a password protected encrypted network computer drive at the research location.

The National Database for Nursing Quality Indicators (NDNQI) RN Survey was conducted yearly at the research site. This survey was available for completion to all registered nurses (RN) in direct patient care settings. Nurses were encouraged, but not required to complete the survey. The survey was conducted electronically and was not traceable directly to the employees. The nursing unit with the highest completion rate, regardless of score, was awarded a pizza party.

NDNQI retention and turnover data was submitted to the NDNQI site coordinator by the directors and managers of the nursing units. These directors maintain these records in accordance with human resources policies for processing separation of employment. Managers and directors submit this data to the NDNQI coordinator through a shared spreadsheet recording total employees, number retained, and number separated by month for each nursing unit. Data was organized to follow the same time period pattern as the NDNQI RN Survey.

## Measurement Methods

NDNQI is administered by Press Ganey Research and is a voluntary submission for benchmarking. The NDNQI RN Survey has established reliability and validity and is widely utilized by nurse leaders in the healthcare industry. The RN: RN collaboration question, which is the basis for the teamwork measurement, is based on a six-point Likert scale.

## Protection of Human Subjects

Ethics approval was granted from the university and hospital Institutional Review Boards (IRB). Approval was also granted by the hospital's Council for Nursing Research and the Human Resources department. All data was already collected and available on the "shelf." No identifiers were included in the data set. All data was aggregated by the nursing unit and untraceable to any individual employee.

## Data Analysis

Correlations were used to test the relationships between teamwork and retention, and teamwork and productivity. Analyses of variance (ANOVA) were used to examine statistical significance in the difference of productivity and teamwork to retention rates. Games-Howell post hoc tests were used for further evaluation. Calculations were performed in IBM® SPSS® Statistics Version 24 by the researcher for analysis and an α of .05 was used to determine significance. Data was screened to assure assumptions of normal distribution and homogeneity of variance was met, prior to conducting correlations and ANOVA.

## CHAPTER IV

## Results

This research explored relationships between teamwork and productivity, and teamwork and retention rates for nurses. A healthy nursing workforce is essential to the delivery of high-quality patient outcomes and the continued viability of any healthcare organization. Teamwork represents a flexible line of defense that protects nurses from the stresses of varying workloads which can lead to separation from the organization.

## Sample Characteristics

The sample group for this study was obtained from a 400+ bed, not-for-profit, non-academic, suburban community hospital serving the Western Piedmont area of North Carolina. Data points were gathered from 36 distinct nursing units, of which 18 were excluded due to incompleteness. The included units were from emergency, critical care, medical, surgical, women's, children's, and behavioral service lines. There were initially 33 units identified for inclusion in the study, 15 were excluded due to incomplete data sets leaving 18 units in the final sample.

## Major Findings

Teamwork and retention rates were analyzed between units with low productivity, medium productivity, and high productivity to determine if a significant difference existed for the three years. Units were coded as (1) "low productivity", (2) "medium productivity", and "(3) high productivity". A one-way analysis of variance was conducted to compare the effects of productivity on teamwork and retention rate for the three years. There was a significant difference in teamwork between units with high productivity and units with medium productivity for 2016, $F(2, 17) = 5.038$, $p = .021$. A

Games-Howell post hoc test revealed that teamwork was significantly higher for the high productivity units compared to medium productivity units ($p = .026$). There was no statistically significant difference between low productivity units and medium productivity units ($p = .250$) or high productivity units ($p = .610$) for 2016. There was no statistically significant difference between productivity categories and retention rate for 2016 ($p = .282$).

There was no significant difference in teamwork between units for 2017, $F$ (2, 17) $= .636$, $p = .543$. There was also no significant difference between units for retention rate $F$ (2, 17) $= 1.806$, $p = .198$. A Games-Howell post hoc test validated the absence of type I errors with no statistically significant differences ($p < .05$) between any productivity groups based on teamwork or retention rate.

There was a significant difference in teamwork between units with low productivity and units with medium productivity for 2018, $F$ (2, 17) $= 3.858$, $p = .044$. A Games-Howell post hoc test showed that teamwork was significantly higher for low productivity units compared to the medium productivity units ($p = .033$). There was no significant difference between low productivity units and high productivity units ($p = .121$) or units with medium productivity and units with high productivity ($p = .866$). Furthermore, a significant difference was also noted for retention rates for 2018, $F$ (2, 17) $= 3.679$, $p = .050$. A Games-Howell post hoc test indicated that retention rates for significantly higher for units with low productivity versus units with medium productivity ($p = .0165$). There was no significant difference in low productivity to high productivity units ($p = .216$) or medium productivity units to high productivity units ($p = .866$). Table 1 details the teamwork and retention comparisons of productivity categories.

**Table 1**

*Comparisons of Teamwork and Retention Rates Between Productivity Categories by Year*

| Year | SS | *df* | MS | *F* | *p* value |
|---|---|---|---|---|---|
| 2016 Teamwork | .528 | 2 | .269 | 5.038 | .021* |
| 2016 Retention | .010 | 2 | .005 | 1.379 | .282 |
| 2017 Teamwork | .331 | 2 | .166 | .636 | .543 |
| 2017 Retention | .008 | 2 | .004 | 1.806 | .198 |
| 2018 Teamwork | .410 | 2 | .205 | 3.858 | .044* |
| 2018 Retention | .006 | 2 | .003 | .882 | .434 |

Note. *p < .05, two-tailed

Teamwork and productivity, and teamwork and retention rate were examined by the Pearson product-moment correlation coefficient to determine strength of association. Teamwork to productivity for 2016 indicated a small positive association ($r = .307$, $p = .215$). The teamwork to productivity association remained positive but decreased in strength in 2017 ($r = .154$, $p = .541$) and became a negative association in 2018 ($r = -.171$, $p = .497$). None of the teamwork to productivity correlations were statistically significant. Teamwork to retention rates were examined in the same fashion resulting in a small positive association in 2016 ($r = .283$, $p = .256$), decreasing in strength but remaining positive in 2017 ($r = .066$, $p = .794$), and increasing to a medium positive association in 2018 ($r = .334$, $p = .176$). Similarly, none of these correlations were statistically significant. Results are provided in Table 2.

**Table 2**

*Correlations of Teamwork to Productivity and Teamwork to Retention by Year*

| Measure | 2016 *r* value | 2016 *p* value | 2017 *r* value | 2017 *p* value | 2018 *r* value | 2018 *p* value |
|---|---|---|---|---|---|---|
| Teamwork to Productivity | .307 | .215 | .154 | .541 | -.171 | .497 |
| Teamwork to Retention | .283 | .256 | .066 | .794 | .334 | .176 |

Note. *p < .05, two-tailed

**Summary**

Teamwork, retention, and productivity data was collected for 2016, 2017, and 2018. Thirty-three initial units were identified for inclusion and ultimately 15 were excluded due to incomplete data and 18 unit's data was analyzed. Teamwork to productivity, and teamwork to retention rate were analyzed using the Pearson correlation coefficient. Analysis of variance was leveraged to determine if statistical significance existed between the mean value of teamwork and the mean value of retention among units categorized into low, medium, and high productivity groups.

**CHAPTER V**

**Discussion**

Healthcare organizations are complex systems composed of many integral parts working together to achieve a common goal. Internal and external stressors constantly create a changing environment that nurses and other clinicians must cope with to provide safe, high quality care to patients. The organization's ability to maintain an equilibrium is highly dependent upon nurses as they are a large percentage of the HCO workforce. Understanding the correlation between teamwork and retention rates, and teamwork and nurse productivity is a key element to creating a health organization environment that can adapt to changing demands on nursing resources.

**Implication of Findings**

Research question one focused on determining if there was a correlation between teamwork and productivity rates. Teamwork and productivity rates showed small to positive correlation during 2016 and 2017 before becoming negative in 2018. While these differences are not significant, teamwork cannot be considered a full mediating factor in productivity, the implication is that it does play a role in productivity. Research question two focused on determining if a correlation existing between teamwork and retention rates. Small to medium positive correlations were noted between each of the three years 2016, 2017, and 2018, with 2018 having the strongest association. Similarly, while these correlations were not significant, indicating teamwork was not a full mediating factor in retention rate, it did suggest that teamwork may have an influence on retention rate.

Further analysis tested the hypothesis that teamwork was a mediating factor in productivity and retention rates. Analysis of variance (ANOVA) showed statistically

significant relationships between teamwork and productivity in 2016 and 2018. While the further analysis showed that the significance was limited to medium and high productivity (2016) and low and medium (2018), this is a notable finding. While other post hoc test revealed no statistically significant findings among other productivity pairs, there is some partial relationship to underscore the importance of teamwork in the optimal functional productivity in the unit. The hypothesis that teamwork would increase directly with productivity along with matching retention cannot be supported by this data. The most notable finding was the 2018 matching strength of teamwork to productivity between low and medium productivity units $F$ $(2, 17) = 3.858$, p $= .044$), and the strongest correlation between teamwork to retention rates ($r = .334, p = .176$). While the latter is not significant, this suggested that teamwork and retention are most closely associated among lower productivity units.

## Application to Theoretical/Conceptual Framework

The Neuman Systems Model was used as the theoretical framework selected for this research. Teamwork represented the flexible line of defense as a mediating factor to increased workload as a stressor that can lead to burnout and separation from the organization. This system focuses on lines of defense that help the system maintain equilibrium within and environment containing various stressors. This research was built on the principle that a single line of defense protected against a single stressor. The results suggested many interrelated flexible lines of defense that are simultaneously working to counteract multiple stressors. This work was also isolated to a single unit and did not consider that individual nurses also represented a similar sub-system that was both influencing and being influenced by the large unit-based system. In a similar

manner, the unit-based systems were part of the organization as a system of systems. The interrelationship of the systems is a key factor to the Systems model.

## Limitations

The sample size of this study was constrained to one hospital system. After available data was acquired and reviewed for 33 units, 15 were excluded due to missing data points. Two quarters of 2016 retention data was unavailable to the researcher. The retention data for this year was based on annualized data for the remaining two quarters.

A single question on the nurse's self-reported perception of teamwork within the units was the sole measure of teamwork. This question was part of a general survey to the nursing staff. Retention data was also separately self-reported by each unit manager to a hospital coordinator and maintained separately from human resources retention data. Direct human resource retention data was the initial target data source but was not made available to the researcher.

Internal and external factors may have contributed to bias. Leadership style, unit sub-cultures, and nursing practice vary widely across the clinical settings included in the study. The needs of the patients, nurses, and units varied across multiple clinical settings and workflows, which made the results of data analysis difficult to generalize.

## Implications for Nursing

Results from this thesis indicated that teamwork was a component factor of retention across varying workloads. Nurse leaders should be aware that creating an environment of maximum productivity can limit the ability of nurses to collaborate and develop the atmosphere of teamwork. Some level of excess capacity allows for nurses to work together to perform individual patient care, as well as the unit and organization

based overhead tasks that are necessary to the successful operations of the health care organization. An overarching theme found by the researcher through the literature review was the necessity of building a shared vision of how the unit functions to create a better work environment. This research developed that theme further by suggesting that collaboration can only occur when there is a need through increased workload, but also the availability of other staff to respond with collaboration. This suggests that teamwork is something that must be developed organically over time and cannot be an ingredient added to units already experiencing high productivity.

Nurse leaders must be aware that just as caring for patients requires art and skill to blend technical excellence, critical thinking with compassion caring for a nursing unit requires these same attributes. The nurse manager must have technical expertise in management, budgeting, staffing, and the patient care needs of the unit along with the compassionate understanding of the implications of these factors on the staff that produce both the output and the atmosphere of the unit.

## Recommendations

A recommendation for consideration by future researchers would be the use of a more robust assessment of teamwork. An instrument that accounts for differences of nursing practice could reduce the variation of perception of functional teamwork. Similarly, units with similar nursing practice and functional workflows could be selected to control for teamwork variation.  Surveys conducted more frequently could be paired with more frequent measures of retention and productivity, potentially providing a stronger sample size for statistical analysis. Finally, a research study across multiple

hospitals should be considered to account for organizational variations as well and internal and external organization behavior.

## Conclusion

Correlations between teamwork and productivity showed small positive associations in 2016 and 2017 with a small negative correlation in 2017 – although not statistically significant. Correlations between teamwork and retentions rates showed small to positive associations in 2016 and 2017 with a medium positive association in 2018 – although not statistically significant. Further analysis by dividing the units into low, medium, and high productivity groups showed statistical significance in 2016 and 2018 between medium and high productivity units and low to medium productivity units respectively. Analysis revealed the 2018 with the strongest correlation between teamwork and retention along with the significance between the low and medium productivity units and teamwork. Teamwork is observed to be a component in the flexible line of defense for nurses against increasing workload to protect retention; however, it was not statistically significant in this sample. These findings can help nurse leaders understand the value of creating a work environment that fosters collaboration and teamwork among nurses as well the multidisciplinary team. This type of environment will provide the best opportunity for quality outcomes, patient safety, as well and engaged nurses that want remain part of a vibrant unit.

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