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Transactional distance theory: the effect of disseminating educational messages to frontline nurses in an acute care hospital setting

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TRANSACTIONAL DISTANCE THEORY: THE EFFECT OF DISSEMINATING EDUCATIONAL MESSAGES TO FRONTLINE NURSES IN AN ACUTE CARE HOSPITAL SETTING

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in

The School of Human Resource Education and Workforce Development

by

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May, 2010
I dedicate this study to frontline registered nurses in hospitals that are open 24 hours a day 7 days a week that work tirelessly at the bedside providing care to patients. These are the individuals who are closest to the patients and are the backbone of hospitals. Their expertise is critical to high quality patient care delivery. Ongoing competency for these nurses is dependent on receiving accurate information regarding changes affecting patient care delivery in a timely manner.

Thank you frontline nurses for caring!
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# TABLE OF CONTENTS

DEDICATION .......................................................................................................................... iii

ACKNOWLEDGEMENTS ......................................................................................................... iv

LIST OF TABLES ...................................................................................................................... viii

LIST OF FIGURES ................................................................................................................... xii

ABSTRACT ............................................................................................................................... xiii

CHAPTER 1. INTRODUCTION ................................................................................................. 1
   Rationale ................................................................................................................................. 1
   Theoretical Framework ........................................................................................................... 3
   Problem Statement ................................................................................................................. 7
   Research Question ................................................................................................................. 8
   Research Objectives .............................................................................................................. 8
   Significance ............................................................................................................................ 10
   Operational Definitions ........................................................................................................ 12

CHAPTER 2. REVIEW OF RELATED LITERATURE ................................................................. 13
   Introduction ............................................................................................................................ 13
   Summary ............................................................................................................................... 22

CHAPTER 3. METHODOLOGY ............................................................................................... 24
   Population and Sample .......................................................................................................... 24
   Protection of Human Subjects ............................................................................................... 24
   Procedures ............................................................................................................................. 25
   Instrumentation ..................................................................................................................... 27
   Data Collection ..................................................................................................................... 30
   Data Summary and Analysis ................................................................................................. 32

CHAPTER 4. RESULTS ............................................................................................................ 35
   Objective 1 ............................................................................................................................ 35
   Objective 2 ............................................................................................................................ 42
   Objective 3 ............................................................................................................................ 44
   Objective 4 ............................................................................................................................ 59
   Objective 5 ............................................................................................................................ 67

CHAPTER 5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS ............................... 75
   Purpose ................................................................................................................................. 75
   Research Objectives ............................................................................................................. 75
   Sample and Procedures ........................................................................................................ 77
   Summary of Findings ............................................................................................................. 79
   Conclusions, Implications, and Recommendations .............................................................. 83
Recommendations for Future Research ................................................................. 90

REFERENCES ........................................................................................................ 92

APPENDIX
A. HOSPITAL IRB APPROVAL ................................................................. 100
B. INFORMATION TO NURSE MANAGERS ................................................ 101
C. EMAIL INSTRUCTIONS ........................................................................ 102
D. EMAIL RESPONSE LOG ...................................................................... 105
E. INVITATION LETTER TO PARTICANTS TO PARTICATE .................. 106
F. EDUCATIONAL MESSAGE # 1 - WHY JOINT COMMISSION? .............. 107
G. EDUCATIONAL MESSAGE # 2 - INFECTION CONTROL ...................... 110
H. EDUCATIONAL MESSAGE # 3 - FIRE SAFETY ..................................... 112
I. MULTIFACTOR TRANSACTIONAL DISTANCE SURVEY ....................... 115
J. PRE-SURVEY LETTER TO PARTICIPANTS ......................................... 130
K. SURVEY INVITATION TO PARTICIPANTS ........................................ 131
L. FIRST REMINDER LETTER TO PARTICIPANTS .............................. 132
M. SECOND REMINDER LETTER TO PARTICIPANTS ............................ 133
VITA ................................................................................................................. 134
LIST OF TABLES

1. Response Rate by Waves........................................................................................................................................31

2. Age Distribution of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week..........................................................................................................................36

3. Marital Status Reported by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week.........................................................................................................................37

4. Highest Level of Nursing Education Reported by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week.........................................................................................................................38

5. Years of Experience of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week.........................................................................................................................38

6. Employment Status Reported by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week.................................................................................................39

7. Primary Shift Scheduled to Work Reported by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week........................................................................................................................40

8. Typical Number of Days Scheduled per Week of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week........................................................................................................................41

9. Nurse Managers’ Span of Control—Number of Patient Care Units Nurse Managers are Responsible for that Supervise Frontline Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week........................................................................................................................................43

10. Description of the Level of Agreement of Frontline Registered Nurses Working in an Acute Care Facility that Provide Services 24 hours a Day 7 Days a Week with Statements Reflecting the Structure of Educational Messages (EMs) sent via Email from the Nurse Manager........................................................................................................................................45

11. Description of the Level of Dialogue of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week with Statements Reflecting the Dialogue related to Educational Messages (EMs) sent via Email from the Nurse Manager........................................................................................................................................47

12. Description of the Level of Learner Autonomy – Self Efficacy of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week with Educational Messages sent via Email from the Nurse Manager........................................................................................................................................48
13. Description of the Level of Confidence of Frontline Registered Nurses Working in an Acute Care Facility that Provide Services 24 Hours a Day 7 Days a Week with Statements Reflecting the Autonomy-Technical Expertise of Educational Messages sent via Email from the Nurse Manager.................................................................49

14. Description of the Level of Agreement of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week Reflecting Learner Experience........................................................................................................................................50

15. Learner Experience as Reflected by Owning a Cell Phone, Personal Digital Assistant, Desktop Computer, Laptop Computer, iPod or MP3 Player or iPhone by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week........................................................................................................................................51

16. Reasons Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week Use the Internet........................................................................................................52

17. Overall Satisfaction with Educational Messages Sent to Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week........................................................................................................................................52

18. Questions from Correlation Matrix that were Eliminated due to High Correlation.......53

19. Factor Loading, Eigenvalues and Variance for Items Representing Transactional Distance for a Four Factor Solution using Principle Axis Factoring and Promax Rotation........................................................................................................................................56

20. Factors, Number of Items and Reliability of Factors Derived from the Four Factor Solution........................................................................................................................................59

21. Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviation by Gender for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 hours a day 7 days a week that Received Educational Messages from their Nurse Manager........................................................................................................................................60

22. One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Gender for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 hours a day 7 days a week that Received Educational Messages from their Nurse Manager........................................................................................................................................60

23. Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviation by Type of Unit for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 hours a day 7 days a week that Received Educational Messages from their Nurse Manager........................................................................................................................................61
24. One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Type of Unit for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager.................................................................61

25. Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviation by Employment Status for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 hours a day 7 days a week that Received Educational Messages from their Nurse Manager.................................................................62

26. One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Employment Status for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager.................................................................63

27. Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviations by Primary Shift Scheduled for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager.................................................................63

28. One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Primary Shift Scheduled for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager.................................................................64

29. Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviations by Primary Day of Week Scheduled for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager.................................................................65

30. One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Primary Day of the Week Scheduled for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager.................................................................65

31. Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviations by Typical Number of Days per Week Scheduled to Work for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager.......................66

32. One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Typical Number of Days Scheduled per Week for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager.......................67

33. Extreme Values for Mahalanobis Distance.................................................................68
34. Casewise Diagnostics........................................................................................................................................69

35. Pearson Product Moment Bivariate Correlations between Overall Transactional Distance and Selected Personal and Professional Characteristics of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager...........................................................................................................71

36. Regression Findings Predicting Transactional Distance for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager........72

37. Analysis of Variance Illustrating Significance Two Independent Variables in Predicting Transactional Distance for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager....................................................72

38. Unstandardized Coefficient Values and Corresponding Standard Errors, Standardized Coefficients, T values and Corresponding Significant Levels for Independent Variables Retained in the Regression Equation Predicting Transactional Distance for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager...........................................................................................................73

39. Excluded Variables, Standardized Beta Values, t Values with Significance Levels, Partial Correlations and Tolerance Levels for the Regression Equation Predicting Transactional Distance for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager...........................................................................................................74
LIST OF FIGURES

1. Transactional Distance for a Four Factor Scree Plot Examination..........................56
2. Histogram Overall Mean of Transactional Distance....................................................69
3. P-P Plot of Overall Mean of Transactional Distance....................................................70
ABSTRACT

Registered nurses working in acute care hospitals that provide services 24 hours a day 7 days a week with a variety of schedules are a challenge for Nurse Managers to communicate rapidly changing, important educational messages in a timely and efficient manner. These RNs can be considered dispersed, or distanced, employees from their Nurse Managers.

Moore’s (1972) Theory of Transactional Distance was the theoretical framework to explore the effects of disseminating educational messages via email from Nurse Managers to frontline RNs working in an acute care hospital that provides services 24 hours a day 7 days a week. A researcher-developed instrument, the Multivariable Transactional Distance Survey, was used to measure transactional distance, transactional distance constructs of learner autonomy, dialogue and structure, learner experience with technology, overall RN satisfaction with the program and selected professional and personal demographics.

Findings indicate that frontline RNs are ready to use email to receive educational messages. They reported confidence in using email and accessibility to a computer. They were overall satisfied with the educational messages delivered electronically. There were no significant differences found in age, gender or type of unit in which the RN worked.

Results confirmed that frontline RNs are dispersed employees, working full time but only three days a week 12 hours a day. Nurses that only work two days a week had a statistically lower transactional distance scale score compared to nurses that work five days a week. There was also a statistically lower transactional distance scale score in the nurses that rotated shifts compared to those that worked the day shift.

Factor analysis of the data resulted in a four-factor model that explained 55.13% of the variance. Ten variables with loadings ranging from .920 to .423 loaded on factor one, dialogue.
Ten variables loaded on factor two, structure, with loadings ranging from .745 to .428. Factor three, learner autonomy, contained six variables with loadings ranging from .938 to .654. The fourth factor was learner experience and consisted of six variables with loadings that ranged from .782 to .457. This supports Moore’s Transactional Distance Theory.
CHAPTER 1

INTRODUCTION

Rationale

“A hospital’s provision of care, treatment, and services is a complex endeavor that is highly dependent on information” (Joint Commission, 2007, p. IM 1). Rapid dissemination of new regulations, policies and evidence-based practices has become increasingly important as “the cycle of change seems to have quickened and intensified…the pace of change has quickened so much that it is difficult to keep up, and second, the changes themselves are filled with so many other changes and increasing levels of complexity that they are difficult to understand” (Malloch & Porter-O’Grady, 2005, p. 1). Continuing education (CE) is an effective way of disseminating new knowledge and practice changes to healthcare providers (Farrah & Graham, 2000). However, CE to registered nurses (RNs) in an acute care hospital setting is complicated by the scheduling of RNs to staff hospitals 24 hours a day 7 days a week. Computer-mediated communication (CMC) technology is replacing formal hierarchies to disseminate information (Daft & Lewin, 1993). Berge (2007) asserted that distance education in the corporate structure is a cost effective, efficient method to train large volumes of employees, reducing the number of trainers needed, works well with employees dispersed geographically and contributes to organizational learning.

RNs “are quintessential learners” (Koerner, 2003, p. 10) making up the majority of healthcare providers in hospitals (Buerhaus, Staiger, & Auerbach, 2008; Dunton, Gajewski, Klaus, & Pierson, 2008; Institute of Medicine, 2004), have a critical role in ensuring patient safety (Institute of Medicine) and a responsibility to the public and their patients to maintain professional competency (Nursing: Scope and Standards of Practice, 2004). “The RN’s
experience, education, knowledge, and abilities establish a level of competence” (p. 12). The American Nurses’ Association’s (ANA) 2004 Scope and Standards for Nurse Administrators prescribe that one critical role of hospital Nurse Managers is to “create a learning environment that is open, respectful, promotes the sharing of expertise to promote the benefits of health outcomes” (p. 8) and to “facilitate educational experiences for nurses” (p. 9). Nurse Managers are accountable to ensure RNs receive CE on new regulations, policies or evidence-based practices in a way that it is understood and implemented quickly.

RNs that staff acute care hospitals which provide services 24 hours a day 7 days a week can be considered dispersed employees. Their schedules vary from month to month. Most have an irregular schedule; they may work days one week, nights the next and weekends the next. Some may work only nights and others only weekend shifts. To enhance nurse satisfaction and retention, most work 12-hour shifts (Kalisch, Begeny, & Anderson, 2008; McGettrick, 2006; Richardson, Dabner, & Curtis, 2003) every other weekend repeating nights and days. “…It is like we have all part-time employees…” (Kalisch et al., p. 132). There are many weekdays whereby nurses are off because they would be working the weekend. Nurses that work 12 hours a day only have to work three days a week to be considered full time. Along with the complex scheduling, the Nurse Manager’s span of control may range from 60 to 160 direct reports (Shirey, Ebright, & McDaniel, 2008) making it common for the Nurse Manager to only see 25-30% of the frontline nursing staff on a daily or weekly basis (Whitaker, personal communication, April 17, 2008). Anand, Manz, and Glick (1998) pointed out that face-to-face (FtF) communication is not always practical and that some information is more appropriately communicated through lean media such as email. Thus, practical strategies such as “educational messages” based on theories of distance education would benefit nurse leaders and organizations who struggle to disseminate information to dispersed frontline RNs.
**Theoretical Framework**

Moore’s (1997) Theory of Transactional Distance is a theory of distance education that provides guidance to practitioners implementing educational messages using CMC to dispersed frontline RNs. “Transactional distance is the gap of understanding and communication between the teachers and learners caused by geographic distance that must be bridged through distinctive procedures in instructional design and the facilitation of interaction” (Moore & Kearsley, 2005, p. 223). Moore and Kearsley (2005) also asserted that the transactional distance is not just a geographic distance, but a psychological distance between teacher and learner that requires a balance between dialogue, structure (course design) and learner autonomy.

Moore (1972) researched more than 2000 documents written related to distance teaching. He defined “distance teaching as the family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors, including those that in contiguous teaching would be performed in the learner’s presence, so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical or other devices” (p. 76). He referred to the traditional classroom teaching as contiguous, with the primary difference from distance teaching as the social interaction in contiguous teaching due to the communication by the human voice, immediate and often emotionally interaction between the teacher and learners.

The separation between the teacher and learner that requires special teaching-learning strategies and techniques (Moore, 1997; Moore & Kearsley, 2005) is distance education. Transactional distance theory is not focused primarily on the geographic distance, but that distance is a pedagogical phenomenon and the effect distance has on “teaching, learning, communication, interaction, curriculum and course design, and the organization and
management of the educational program” (Moore & Kearsley, 2005, p. 223). There can be a psychological distance between teacher and learner even in FtF education (Rumble, 2001).

Moore (1997) described the teaching behaviors required in distance education as dialogue and structure; and learner behavior as learner autonomy. The relationships between the three variables 1) dialogue, 2) structure and 3) learner autonomy build the theoretical framework that explain teaching procedures and learner behavior in the distance learning setting (Moore, 1997). There is an inverse relationship between structure and dialogue e.g. higher structure and lower dialogue lead to high transactional distance (Saba, 2003). The right balance between structure and dialogue is highly dependent of the subject content and the learner sophistication (Moore & Anderson, 2004).

The concept of transaction dates back to the 1800s to John Dewey who “constant stressed the transactional nature of the relations between the organism and the environment” (Ozmon & Craver, 2008, p. 122). Distance education has changed dramatically over the years to include changes in technology and CMC; and from a low ranking status to a higher ranking of acceptance that is applicable not only to academia but to new sectors of the population such as government and corporate trainers (Rumble, 2001). Distance learning is becoming culturally accepted as more and more employees use technology at home and the pressure for employees to take charge of their own learning increases (Berge, 2007). “Technology introduces an element of distance that is not present in FtF” (Benson & Samarakreema, 2009).

Frontline RNs (learners) that work a variety of schedules are distanced from their Nurse Managers (teachers). This physical distance tends to create a communication gap that can cause a psychological misunderstanding between the Nurse Manager and frontline RNs. Special teaching techniques, such as educational messages disseminated via CMC can bridge this gap.
Dialogue

Dialogue describes the positive interaction, such as words and actions, between the teacher and learner that is purposeful, constructive and valued by each party where one gives instruction and the other responds (Moore, 1997; Moore & Kearsley, 2005). Dialogue is synergistic, with each party being respectful and an active listener. Holmberg (2003) emphasized the importance of empathy between the teacher and learner that promotes pleasure and learner motivation. He called this friendly conversation-like presentation of learning “guided didactic conversation”. Moore (1997) asserted that the goal of educational dialogue is to improve communication between the teacher and the student.

Communication Media. Environmental factors effecting dialogue are the existence of the learning group and its size, language and communication medium (Moore, 1997; Moore & Kearsley, 2005). Dialogue can be one-way or two-way, depending on the communication medium and may include FtF, written materials, video teleconferences, television, audiotape, email and/or on-line. Courses taught through on-line or email is considered highly structured because it is in writing; and dialogue is lower. However, dialogue is higher with on-line or email than correspondence because the speed and frequency of inputs and responses are high. Some students are more comfortable with asynchronous text-based communication methods where there is less dialogue (Moore & Kearsley, 2005).

Structure

Moore (2005) called the course design “structure” that includes the learning objectives, themes, information, presentation, illustrations, assignments and tests. This is highly dependent on the teacher and communication medium and can be rigid or flexible depending on the purpose and content (Moore, 1997). Positive conversation, called dialogue, is the responsibility of the teacher to develop well-written materials (Garrison, 2000; Moore & Kearsley, 2005). The course
structure should flow logically and guide the student on how to find, use and manage information (Sandoe, 2005).

Highly structured programs have low teacher-learner dialogue and high transactional distance. Conversely, low structured programs have high teacher-learner dialogue and lower transactional distance (Moore, 1997). “Most designers believe that courses should be organized into short, self-contained segments, with frequent summaries and overviews” (Moore & Kearsley, 2005, pg. 17). Moore and Anderson (2004) asserted that for beginning teachers, it would be better to have too much structure that provides specific objectives, content, learner activities and evaluation than too much dialogue where the students are confused and disappointed. With experience, teachers can create the same objectives with more dialogue and less structure.

**Learner Autonomy**

According to the Nursing: Scope and Standards of Practice (2004), “all nursing practice, regardless of specialty, role or setting is fundamentally independent practice” (p. 10). As independent practitioners, RNs are individually accountable for all aspects of their practice” (p. 11) which includes responsibility “for individual competence and the commitment to the process of lifelong learning to maintain current knowledge and skills through formal and continuing education…” (p. 10-11).

The theory of transactional distance was developed during the era when all education practice was based on behaviorist views; that is maximum teacher control with behavioral objectives. Teachers were challenged to produce the perfect set of objectives that fit every learner. A pattern begin to develop whereby some students had characteristics that were more successful when programs were less structured and highly dialogic and used the material to achieve their own personal goals, while others succeeded in more structured, less dialogic
programs (Moore, 1997). Autonomous learners that have advanced competence are comfortable with less structured and more dialogic programs (Moore). Coggins (1989 cited in Moore 1997) asserted, “One of the best predictors of success in distance education is the educational background of the student” (p. 171).

Moore (1972) asserted that the autonomous learner takes responsibility for his or her own behavior and learning by 1) identifying the need to solve a problem, acquiring a skill or obtaining information, 2) setting objectives on achievement and 3) identifying criteria for success. Autonomous learners have motivating behaviors of self-efficacy that include resourcefulness, initiative and persistence in one’s learning (Confessor & Park, 2004; Ponton, Derrick, Carr, & Hall, 2005). However, Miliadou and Yu (2000) asserted that many learners do not feel comfortable with CMC, and technical skills are important to the success of distance education.

In this research study, the dialogue are educational messages, the communication media is computer mediated communication via email, structure is the content of the educational messages, teachers are Nurse Managers, and learners are frontline RNs. As pertinent new or revised information is received, educational messages (dialogue) will be disseminated via CMC (communication media) by the Nurse Manager (teacher) to the frontline RN (learner) with the opportunity to provide feedback or ask questions (dialogue).

**Problem Statement**

The purpose of the research study was to explore and determine the effect of disseminating educational messages from Nurse Managers to their frontline RNs working in an acute care hospital that provides services 24 hours a day 7 days a week on 1) transactional distance, 2) the transactional distance constructs of structure, dialogue and learner autonomy, and 3) overall RN satisfaction with the educational messages via email.
**Research Question**

The research question was: What is the impact of disseminating educational messages via email to frontline RNs working in an acute care hospital located in the Southeastern region of the United States (U.S.) that provides services 24 hours a day 7 days a week on 1) transactional distance, 2) transactional distance constructs of: structure, dialogue and learner autonomy and 3) overall RN satisfaction with receiving educational messages via email.

**Research Objectives**

1. To describe frontline RNs working in units of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following demographics:
   a. Age
   b. Gender
   c. Ethnicity
   d. Marital status
   e. Highest nursing degree obtained
   f. Years of experience as a RN
   g. Employment status (e.g. full-time, part-time, relief)
   h. Type of unit categorized: (e.g. intensive care, medical surgical)
   i. Primary shift scheduled to work
   j. Primary day of week scheduled
   k. Typical number of days per week scheduled
   l. Typical number of hours per day scheduled
2. To describe Nurse Managers that supervised frontline RNs working in an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following demographics:
   a. Age
   b. Gender
   c. Years of experience as a RN
   d. Years of experience as a Nurse Manager
   e. Current management span of control as measured by responsibility for the following:
      i. Number of patient care units
      ii. Number of campuses units located
      iii. Number of licensed patient care beds/procedure rooms
      iv. Number of RN employees
      v. Number of full-time equivalents

3. To describe frontline RNs working in units of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following characteristics of transactional distance as measured by the *Multifactor Transactional Distance Survey*.
   a. Structure (as a construct of transactional distance)
   b. Dialogue (as a construct of transactional distance)
   c. Learner autonomy (as a construct of transactional distance)
   d. Transactional distance
   e. Learner experience

4. To examine the relationships between selected demographic characteristics of frontline RNs working in an acute care hospital located in the Southeastern region of the U.S. that provides
services 24 hours a day 7 days a week and transactional distance as measured by the

*Multifactor Transactional Distance Survey.*

a. Gender  
b. Type of unit categorized: (e.g. intensive care, medical surgical)  
c. Employment status (e.g. full-time, part-time, relief)  
d. Primary shift scheduled to work  
e. Primary day of week scheduled  
f. Typical number of days per week scheduled  

5. To determine if a model exists which would explain a significant portion of the variance of transactional distance as measured by the *Multifactor Transactional Distance Survey* from the subscales or latent factors and associated variables that emerge statistically following factor analysis of the dataset and selected demographic characteristics of gender, age, years of experience as RN, employment status, primary shift to work, primary day of the week to work and typical number of days per week scheduled.

**Significance**

Most of the distance education research takes place in the academic setting and a paucity of distance education studies exists in the organizational setting or the professional healthcare setting. This researcher was unable to find empirical research on distance education in the hospital setting using CMC to frontline RNs that are distanced from their leaders due to the necessity of covering an acute care hospital 24 hours a day 7 days a week.

Most educational information to frontline RNs on new regulations, policies or evidence-based practices is distributed during staff meetings, which are typically held once a month. Only a small percentage of staffs attend these meetings on a regular basis. Unlike banks, education or other businesses where employees work basically Monday through Friday and a scheduled staff
meeting at a set time of day and week would easily suffice for communicating important information; this is particularly challenging in a busy hospital with irregularly scheduled employees. The continuing fast paced change of the healthcare environment, continual revisions of regulations, typically based on evidenced-based research, has multiplied the concerns of nursing leaders to ensure patients are cared for safely. And given that continuing education is a fundamental responsibility of Nurse Managers (Scope and Standards for Nurse Administrators, 2004), strategies to disseminate educational messages to frontline RNs will contribute to the body of knowledge for nursing leadership practices. CMC is an innovative technique that could impact organizational learning and the flow of information to frontline RNs.

The nursing profession contracts with society to “promote health, to do no harm, and to respond with skill and caring when change, birth, illness, disease or death is experienced” (Nursing: Scope and Standards of Practice, 2004, p. 17). It is the individual responsibility of the nurse as lifelong learners to obtain appropriate and adequate “professional development and continuing education opportunities to maintain and advance skills and enhance competencies” (p. 20). Berge (2007) asserted that it is becoming increasingly important for employees to become lifelong learners. Joint Commission (2009) mandated that staffs participate in ongoing education and training to ensure quality care is delivered and it is the nurse leaders and organization’s responsibility to ensure employees are competent to complete their assigned duties.

“Nursing is a dynamic profession, blending evidence-based practice with intuition, caring, and compassion to provide quality care. RNs must proactively deal with constant change and must be prepared for an evolving healthcare environment that includes advanced technologies” (Nursing: Scope and Standards of Practice, 2004, p. 19). In the new age of technology, nurses should have instant access to information and consider lifelong learning a
professional mandate (Koerner, 2003). Yet nurse leaders struggle to keep frontline nurses
informed of information vital to patient care. Thus, strategies to enhance dissemination of
educational messages to frontline RNs will contribute to patient safety, leader’s responsibility to
ongoing staff competency and the individual RN’s responsibility for ongoing education and
training.

**Operational Definitions**

For the purposes of this study, the following operational definitions were used:

**Computer mediated communication:** For this study, CMC was asynchronous email.

**Dialogue:** Purposeful, constructive interaction between the Nurse Manager and the frontline RN
or between the frontline RN and co-workers, to improve understanding of information by the
frontline RN (Moore & Kearsley, 2005). For this study, dialogue was email messages and the
communication media will be email.

**Learner autonomy:** The self-motivation for learning and the technological expertise related to
CMC of the frontline RN (Ponton et al., 2005, Miltiadou & Yu, 2000).

**Registered nurse:** RNs that staff units that provides services 24 hours a day 7 days a week in an
acute care hospital.

**Registered nurse, frontline:** A registered nurse who provides direct patient care at the bedside.

**Structure:** The components of educational messages / educational material: content, organization,
clarity and convenience (Moore & Kearsley, 2005).

**Transactional distance:** The perceived closeness between the frontline RN and the Nurse
Manager; and the perceived closeness between the frontline RN and co-workers (Bischoff,
CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

To conduct a comprehensive review of the literature, the Louisiana State University library of indexes and databases, ERIC, EBSCO host, Inform, SAGE, JSTOR, LSU Electronic Thesis and Dissertations Library, Networked Digital Library of Theses and Dissertations, and Google Scholar were searched. The search initiated in the nursing body of knowledge and expanded to organizational management, organizational development, distance learning, and communication technology. Key words used in the literature search included: distance learning, transactional distance, organizational communication, CMC, flow of information and information dissemination. In addition, a review was conducted of regulatory agencies and standards affecting nursing competence.

Continuing Education

“Sound decision making by nurses requires a current knowledge and skill base and the ability to translate this knowledge into practice” (Farrah & Graham, 2000, p. 4). Professionals typically use FtF CE programs for networking, sharing of ideas and best practices. In a study of physician’s perceptions of asynchronous continuing medical education versus FtF, Sargeant, Curran, Allen, Jarvis-Selinger, and Kendall (2006) found that orientation to the technology and clear facilitator roles were important, and that effective collegial interaction could occur. Farrah & Graham studied the variables that would influence nurses to implement practice-related changes proposed in the CE offering and found the top three to be potential benefit to the patient, perceived value of the proposed change and extent to which the change addressed a relevant practice problem.
Distance Education

The use of technology and availability of connectivity e.g. e-mail, chat rooms, computer conferencing, has become an integral part of CE and the information revolution (Wilhelm, Rodehorst, Young, Jensen, & Stepans, 2003). Distance learning has been suggested by the Center for Disease Control (2009) as a teaching method to maintain isolation for students who stay home for flu-like symptoms. DeBourgh (2003) pointed out that students acclimate to the mode of instruction quickly; that the influence of the instructor and instructional strategies are a key to success.

On-line learning is not a passing fad (Lightfoot, 2006). Of the U.S. institutions offering courses for health professionals and related sciences, approximately 33% offer fully on-line programs (Allen & Seaman, 2008). The Distance Education and Training Council (DETC) is an accreditation body that promotes distance education standards. In 2007, the DETC surveyed its 67 accredited institutions to include 44 post-secondary and 40 degree programs. There were 579,067 new students in non-degree programs and 117,492 new students in degree (associate, bachelor, master and doctorate) programs. The average age of the new students was 37 years old, most were employed and about a third of the students had tuition paid by the employer.

Studies have shown that students learn as much in on-line courses as they do in traditional courses (Meyer, 2002; Neuhauser, 2002; Roblyer, Freeman, Donaldson, & Maddox, 2007; Rovai, 2002; Williams, 2006). Williams conducted a comprehensive meta-analysis of allied health professionals with a focus on student achievement. Twenty-five studies with 34 effect sizes (ES) met criteria for inclusion. Achievement measurement varied, from course grades to knowledge and skill assessments. The findings for student achievement in distance learning compared to traditional classroom was an ES of .15 with a 95% confidence interval from .07 to .23; reflecting a slightly positive gain in distance learning achievement. Students
with prior work experience or working professionals had a significantly greater achievement gain with an ES of .74 with a 95% confidence interval of .54 to .95.

Young (2006) identified seven items important to students’ perception of effective online course as: adapting to student needs, providing meaningful examples, motivating students to do their best, facilitating the course effectively, delivering a valuable course, communicating effectively and showing concern for student learning. Other studies found that flexibility, or the ability to do the work when and where they wanted, as an important factor in choosing an online course over the traditional classroom (DeBourgh, 2003; Northrup, 2002; Trickler, 2001).

Communication is one of the most important satisfaction factors in distance education (Ortiz-Rodriguez, Telg, & Irani, 2005; Rangecoft, Gilroy, Tricker, & Long, 2002). In a qualitative study, Ortiz-Rodriguez et al. found that timely and individualized feedback was the most essential factor within communication because they “couldn’t just go knock on the professors’ door” (p. 101). Another factor was good communication tools, such as email, chat rooms and discussion boards that allowed them to interact with others.

**Transactional Distance**

Few studies have investigated the relationships among the constructs of transactional distance theory (Bischoff et al., 1996; Chen, 2001). Bischoff et al. found no significant difference of transactional distance between the traditional and distance education courses. However, transactional distance was lower with courses that offered email as a mechanism of communication with courses that did not offer email scoring statistically lower on dialogue ($M = 3.3$, $SD = 1.16$, $p = .04$) and structure ($M = 6.6$, $SD = 2.4$, $p = .02$).

Huang (2002) found student satisfaction with on-line courses to have no significant correlation with gender ($r = .03$, $p = .89$); a moderate correlation with both age ($r = .39$, $p = .03$) and previous technological experience ($r = .39$, $p = .04$). Huang found a statistically significant
correlation between learner autonomy and interaction ($r = .49, p < .01$). The most significant finding was the high relationships between technical experience (what he calls interface) and structure, interaction and learner autonomy with correlation coefficients all be over .92; thus concluding the importance of the learners’ technological skills.

**Learner Autonomy** The higher the transactional distance gap, the more the learner has responsibility for learning (Moore, 1972; Moore & Kearsley, 2005). Chen (2001) found learners with a higher technological skill level reported a lower transactional distance, suggesting the importance of considering the learners skill level with Internet and email when evaluating distance learning endeavors. Similarly, Huang (2002) found that learner autonomy increased as computer skills improved.

In an unpublished dissertation, Sanders (2006) studied the effect learner attributes, structure and dialogue had on student performance as measured by final grades and student satisfaction in an on-line asynchronous course. He found that most students were satisfied; structure and dialogue was a significant predictor of student satisfaction; but found a significant negative correlation between age and satisfaction. Learner autonomy, structure or dialogue was not significant in predicting student performance as measured by final grades.

**Structure** In a qualitative study of nursing students participating in an asynchronous online seminar, Wilhelm et al. (2003) identified the need for course structure and orientation. During the course many were frustrated with the technology, had trouble accessing, understanding asynchronous learning and wanted more teacher involvement. Some requested more clearly defined objectives and missed the teacher’s personal FtF input on experiences with patients. However, at the end of the study students felt more comfortable with the technology.

In contrast, studies have shown that technical expertise is not a predictor of student satisfaction. In study of graduate nursing students in distance education courses, DeBourgh
(2003) found that the instructor and instruction to be statistically significant to student satisfaction \((r = .46, p = .01)\) explaining 21% of the variation in student satisfaction. Competence with technology was not statistically significant. Similarly, Stein, Wanstreet, Overtoom and Wheaton (2005) found structure to be highly correlated to interaction \((r = .79, p < .01)\) but technical expertise had no effect on satisfaction.

Smith, Passmore and Faught (2009) conducted a qualitative study of the challenges of on-line nursing courses and the authenticity of assessing whether the students could apply the knowledge they learned to the real-life situations. Case studies and simulation of real-life situations through group projects were used to assess application of theory to practice.

**Dialogue (Interaction)** Dennen, Darabi and Smith (2007) studied instructor-learner interaction by comparing instructors’ beliefs about students to students’ beliefs about instructors, and found that learners feel more satisfied if their interpersonal communication needs are met. Ninety-eight percent of learners ranked “check email to assess learner needs” as the most important instructor practice followed closely by “provide timely feedback.” This validated Bischoff et al.’s (1996) findings that email appeared to enhance dialogue stating “electronic mail, rather than serving as just another avenue for exchanging information about assignments and deadlines, was a vehicle for communication and interpersonal interaction” (p. 10). Paul (2003) suggested that interaction can be accomplished through email, instant messaging, phone, fax or video conferencing. However, employees value communication from within their own occupation or group more than from outside their group (Cho & Lee 2008; Grice, Gallois, Jones, Paulsen, & Callan 2006).

Swan (2002) found a significant relationship between instructor-learner interaction and course satisfaction \((r = .76, p = .01)\), perceived learning from instructors \((r = .71, p = .01)\),
student-student interaction and course satisfaction ($r = .44, p = .01$) and structural consistency and course satisfaction ($r = .33, p = .05$).

**Computer Mediated Communication**

“Computer-mediated communication is synchronous or asynchronous electronic mail and computer conferencing, by which senders encode in text messages that are relayed from sender’s computers to receivers” (Walther, 1992, p. 52). Examples of asynchronous CMC include email, WebPages, databases and discussion boards; and examples of synchronous include chat rooms, instant messaging (IM) and text messaging (Miltiadou & Yu, 2000; Tombley & Lee, 2002). Rapidly changing technology has led to high speed wireless Internet technologies such as wireless fidelity (Wi-Fi) allowing users to access Internet via laptops and personal digital assistants (PDAs) from anywhere, anytime while on the move (Wei, 2006). Corporations are beginning to use web-based learning (Tombley & Lee, 2002).

According to Pew Internet & American Life Project (2009), 74% of all adults use the Internet, of which 87% are ages 18-29; and 72% use the Internet daily. The use of IM is growing rapidly. In 2004, 53 million people reported using IM with 11 million of these using IM at work. Of those using IM at work, 68% think it is a positive thing, 50% feeling it saves time, and 40% saying it improves teamwork (Pew Internet & American Life Project). Ramirez, Dimmick, Feaster and Lin (2008) found that IM was superior to email and land-line telephones, but not to cell phones. The computer is the most common way people interact both personally and professionally (Kelly & Keaton, 2007).

Email has many advantages such as allowing interaction between teacher-student anytime anywhere (Lightfoot, 2006), is practical when there are large numbers of students (Le & Le, 2002; Young, 2006) and is convenient. Granberry (2007) asserted, “Email enhances organizations’ and nurses’ ability to be responsive and timely” (p. 127). But Young asserted that
the instructor must work hard managing the volume of email, responding timely to meet the varied needs and demands of the student. Lightfoot found that most students were aware that email communication is different from FtF and should be approached carefully; but didn’t always follow this practice. Students put the most thought and effort into emails that are delivered to “groups of other students” that may judge them socially; followed by emails to instructors who would assign grades; less effort and thought went into emails sent to individual students; and males put less thought and effort into email messages to instructors than females. Email reduces contextual cues present in FtF forcing the student to concentrate on themselves (Sassenberg, Boos, & Rabung, 2005).

CMC differs from FtF communication in that written media overcomes situational constraints such as time, location and distance (Rice & Shook, 1990), lacks exchange of non-verbal cues that are typically rich in relational information (Rice & Shook, 1990; Tidwell & Walther, 2002); but Walther (1992) also argued that this improves over time to equal FtF communication. Dickey, Wasko, Chudoba and Thatcher (2006) asserted that emotions can be expressed through text only communication by a variety of signal and symbols. For example, the colon followed by the parentheses key is used to express emotion; all caps are used for shouting or to convey anger, or abbreviations such as LOL for laughing out loud.

Flanagin and Metzer (2001) studied uses and gratifications of CMC in the workplace. A factor analysis of a 21-item questionnaire resulted in 10 clusters of uses: information, learning, play, leisure, persuasion, social bonding, relationship maintenance, problem solving, status and insight into oneself; but most fulfilled the important organizational need of information seeking. Stephens, Sornes, Rice, Browning and Saetre (2008) studied sequential use of information and communications technology in the workplace arguing that most studies involve a single technology when the reality is that rarely are media types used independent of one another. They
found that information (getting it, giving it, learning from it, and problem solving with it) was the most common reason communication technology were used.

Duke University experimented with giving out free iPods and found that 75% of surveyed freshmen used them in at least one class and were mostly used to replay lectures (Read, 2005). Loan and Teasley (2009) studied the attitudes and perceptions of both instructors and students in a large university where iPods supplemented traditional FtF. They found that students used the iPods mostly to reinforce lectures they had already attended and didn’t feel that it improved instructor teaching.

“At top management support and information technology enablers are considered the intraorganizational facilitators for information sharing and quality information” (Hatala & Lutta, 2009, p. 6). Technology has helped organizations that have displaced employees (Rosenfeld, Richman, & May, 2004). These include “voice messaging, electronic mail, audio conferencing, videoconferencing, and intranets” (Clunan & Marakus, 1987 cited in Rosenfeld et al., 2004).

Rosenfeld et al., in a study of a healthcare organization merger that compared office employees to field employees on the relationship of information adequacy to job satisfaction and organizational culture, reported that as the “complexity of an organization’s structure increases, the adequacy of communication declines…” (p. 43).

Organizations can choose from a variety of communication technologies (Anand et al. 1998; Te’eni, 2001). Walther (1992) asserted that satisfaction with CMC could be linked to the ability of the individual to use the system at their convenience. Trevino and Webster (1992) studied email and voice mail, and found that management support was positively related to ease of use; and ease of use influenced perceptions of the system and their outcomes. Wei (2006) studied Wi-Fi adoption practices in the workplace and found that only one-fifth of the
respondents used Wi-Fi at the time of the study. Likely users were younger (46.27), more educated, had a higher level of innovativeness and reported that people around them were users.

D’Urso & Rains (2008) pointed out that telephone, email, IM and FtF are commonly used by organizations, but at various levels of integration depending on the goal of the information to be communicated (Te’eni, 2001). Evolving communication technologies such as video conferencing allow for richer technology driven communication (Fulk & DeSanctis, 1995). Fulk & DeSanctis described advancements in communication technology that impact organizations as 1) increase in speed of communication with high volumes of data being transmitted, 2) reduction in cost of technology over time, 3) rise in communication bandwidth allowing for multiple frequencies to travel simultaneously, 4) expanded connectivity as networks increase and 5) improved storage and retrieval of data. When CMC is frequent and extended over time, CMC partners can reach and sometimes exceed FtF interactions (Tidwell & Walth, 2002); and email is considered lean media, it is still capable of being rich (Ngwenyama & Lee, 1997).

Abbassi and Chen (2008) differentiated the characteristics of CMC from non-CMC (e.g. reports, resumes) by asserting that CMC is rich in interaction, social cues, expressions of feelings and emotions, and a new idiosyncratic lingo. Technology affects not only what we communicate, but how we communicate (Te’eni, 2001). Studies have shown the workers create shared understandings through texts allowing more complex or equivocal tasks to take place through CMC (Dickey et al., 2006). Results of a meta-analysis of distance learning outcomes by Bernard et al. (2004) found significant positive outcomes in achievement and attitudes in the distance learning environment in the asynchronous verses synchronous format. He suggested that synchronous does not allow the same flexibility or individual interaction between instructor-learner that asynchronous provides. Sometimes the synchronous distance education lacks the same quality (technology, sound) as FtF.
Mick and Mark (2005) reviewed nursing and healthcare organizational research from 1950 to 2004 and identified four gaps in nursing research, one of those being “the relative lack of attention paid to the impact of new technologies, including electronic communication, on the organization’s work processes of patient care” (p. 319). Te’eni (2001) asserted that the “analysis of communication flows between people in organizations has declined dramatically” (p. 292) and “few studies have evaluated factors shaping organizational members’ perceptions of communication media” (D’Urso & Rains, 2008, p. 487).

Daft, Lengel and Trevino (1987) asserted that future research is needed to “develop methods of analysis that will determine which aspects of managerial communication and decision-making are amenable to technological support and which are not” (p. 364). D’Urso and Rains (2008) pointed out that members come to the workplace using FtF and telephone communication; but email and IM norms are relatively new, making this an important area to study. Now that CMC are becoming more customary in the workplace, communication scholars are becoming interested in the effect they have on communication processes (Stephens, Sornes, Rice, Browning, & Saetre, 2008).

Email is an important communication medium to disseminate CE messages to dispersed frontline RNs, is likely to be the communication tool of choice for Internet-based learning (Le & Le, 2002; Lightfoot, 2006) and more popular than FtF interaction between student-learner and learner-learner (Berge, 1997; Gustafson, 2004; Sherry 2000).

**Summary**

RNs that work in hospitals that provide services 24 hours a day 7 days a week are considered dispersed employees. Most are only at the hospital and available three days a week; and even less if they cover weekends. However, RNs have a professional obligation to maintain skills and competencies to care for patients; and it is the role of the Nurse Manager to ensure that
staffs are competent to provide care. Technology is becoming more accepted as a method of rapid communication; and distance education is becoming more accepted as a learning methodology. Students learn as much in on-line courses as they do in the traditional classroom. The flexibility of on-line courses is a student satisfier. Given the rapid changes in regulatory requirements that mandates hospitals to respond with changes in policies and practices, as well as the necessity to staff acute care hospitals 24 hours a day 7 days a week, strategies to enhance flow of information to the frontline nursing staff in a timely and efficient manner are important to nursing leaders and organizations. Transactional distance theory provides the framework for a strategy to communicate educational messages to dispersed RNs.
CHAPTER 3

METHODOLOGY

Population and Sample

The research setting was a two-campus non-profit, academic, acute care hospital providing a full range of services 24 hours a day 7 days a week located in the Southeastern region of the U.S. The target population for this study was defined as frontline RNs working in acute care hospitals that provide services 24 hours a day 7 days a week. The accessible population was frontline RNs working in an acute care hospital that provides services 24 hours a day 7 days a week located in the Southeastern region of the U.S. Eligible RNs worked in a variety of types of units, variety of unit sizes, were employed full-time, part-time or relief, were scheduled straight shifts, variable shifts, days, nights, or weekends, and various number of days or hours per week.

A census sampling procedure was used for the study. The frame for the accessible population was established by 1) obtaining a current list of employed frontline RNs from the human resource department of the acute care hospital participating in the study 2) verifying the accuracy of the RN list with the Nurse Manager 3) confirming that the RN was employed at the beginning of the research study and 4) as well as prior to sending out the survey instrument. RNs that were newly employed after the beginning of the study period were not eligible to receive the survey even if they received the email educational messages for a portion of the study. The total accessible population was 422 frontline RNs. The sample was 100% of the accessible population.

Protection of Human Subjects

The NCI Protecting Human Research Participants on-line course was completed by this researcher. Prior to implementation of the study an application for exemption from institutional
oversight from the Louisiana State University Institutional Review Board for Human Subject Protection was submitted and was granted approval #E-4846. In addition, permission from the Institutional Review Board of the hospital located in the southeastern region of the U.S., the research study setting, was requested and obtained (Appendix A).

Email exchange occurred between the Nurse Manager and frontline staff in a blind copy format so that email addresses were not shared with co-workers through the current study. Participants were assured that there would be no consequences to employment based on information obtained during the study, or should they decide not to participate.

**Procedures**

Twenty-one Nurse Managers were identified as being direct supervisors of the frontline RNs eligible to participate in the study. All 21 Nurse Managers attended the informational meetings that were held to 1) describe the purpose and design of the research study, 2) solicit participation, 3) outline procedures and 4) answer questions. An information packet was distributed at the meeting that included an Information Sheet (Appendix B), a step-by-step guide on emailing and sending the educational messages blind copy to the frontline RNs (Appendix C), a response log (Appendix D) and a copy of the informational letter to the frontline RNs (Appendix E). During the informational meeting, the researcher learned from one of the Nurse Managers that the “return receipt” feature does not work with many of the home email addresses. After verification, it was decided that this would not be tracked by the researcher. The Information Sheet described the rationale for the study, purpose of the study, description of participants, study procedures, benefits, risks, right to refuse and timeline for the study. The researcher offered to assist each Nurse Manager as needed with setting up a list serve of email addresses. One Nurse Manager requested this assistance. Two requested assistance with the blind copy feature.
To initiate the process, the informational letter (Appendix E) was sent to the Nurse Managers with a request to email the letter to frontline RNs as instructed in the informational meetings. The purpose of the informational letter was to explain the purpose of the study, instructions to participate and to expect emailed educational messages over a three week period.

Three educational messages: “Why Joint Commission” (Appendix F), “Infections: Healthcare Associated Infections” (Appendix G) and “Fire Safety: Tips for Success” (Appendix H) were developed by the researcher based on regulations, policies and evidence based practices. They included information from the following references: The Joint Commission, the Center for Medicare and Medicaid Services Conditions of Participation, Louisiana State Department of Health and Hospital Licensure, Hospital Policies and Procedures, and evidence based guidelines from healthcare quality agencies such as Center for Disease Control. The educational messages were designed as supplemental education. Thus, critical information was not withheld from those that decided not to participate, and the Nurse Manager was not allowed to deliver the educational message in another method other than email.

The educational messages were short with an estimated to read time of no longer than 15 minutes. The educational message was designed by the researcher, but requested delivery by the Nurse Manager. This ensured that each frontline RN received the same message. Weekly for three weeks, the researcher emailed one of the researcher-designed educational messages to the Nurse Manager. With each message, the Nurse Manager was requested to send the educational message blind copy to the frontline RN staff so that staff email addresses were not globally distributed to co-workers through the research process. In addition, the Nurse Manager was instructed to blind copy all emails to the researcher and to forward any responses relevant to the research study to the researcher. Responses could include email responses or verbal comments.
Sixteen of the 21 Nurse Managers participated in the study. Of the five that did not participate, one Nurse Manager resigned and one transferred to the quality department. The other three did not follow through on sending the educational messages to the frontline staff. Thus, there were 422 accessible RNs with email addresses that reported to the 16 participating Nurse Managers.

An unexpected contemporary history threat to the study was a significant organizational restructuring of the nursing division during the study period. A new Chief Nurse Executive was appointed during the three-week period when educational messages were sent. During the survey period, one Nursing Director was terminated, one Nurse Manager was asked to step down and two Nursing Managers were promoted to Nursing Directors as part of the restructure. One of the nursing units was relocated to a different floor, and the staff was reassigned to a new Nurse Manager. Another unit was notified that their unit would be dissolved in late spring. In addition, during the second week that the educational messages were sent, the organization’s email went down for three days.

The Nurse Managers reported only three responses from the frontline nurses to the Nurse Managers related to the email messages. All of the responses were positive about the process. In addition, the researcher received three very positive emails directly from the frontline. Thus, the logs sent back to the researcher were blank. Except for the organizational email outage, there were no technical difficulties reported to the researcher regarding the email messages.

**Instrumentation**

An exhaustive review of the literature indicted that no instrument existed that satisfactorily measured the objectives of this study. Most studies utilized researcher developed instruments, included one or more constructs of transactional distance, were directed to academia
and some included nursing students. Therefore a new instrument, the *Multifactor Transactional Distance Survey*, (Appendix I) was developed by the researcher for the purposes of this study.

**Instrument Development**

Studies with instruments that had established reliability and validity were categorized by constructs of structure, dialogue, interaction, learner autonomy, and/or CMC. Questions were carefully reviewed for applicability to the present study. Most were eliminated due to things like “a syllabus was provided” or “the instructor clearly outlined the grading scale” (Huang, 2002). Other items provided useful themes such as “I receive feedback from the instructor as often as I need to” (Huang, 2002) became “feedback from my Nurse Manager was timely”.

For the instrument in the current study, three items were adapted from Bischoff et al. (1996), an investigator-developed instrument: two items measuring transactional distance directly and one item pertaining to dialogue. Instrument reliability was established using Cronbach’s alpha (score not reported), and validity was established by an expert panel, factor analysis and formative evaluation of course work.

Nine additional items were adapted from the *Appraisal of Learner Autonomy* instrument developed by Ponton et al. (2005) and the *Learner Autonomy Profile* (LAP) developed by Confessore and Park (2004). The *Appraisal of Learner Autonomy* is a measure of self-efficacy within the construct of autonomous learning. The original instrument consisted of 21 items. Pilot testing for content validity resulted in a final instrument consisting of nine items with a reliability of .86 Cronbach alpha. The LAP is a 66 item instrument measuring four constructs of desire to learn, learner resourcefulness, learner initiative and learner persistence. Cronbach alpha for each construct were desire (.94), resourcefulness (.96), initiative (.96) and persistence (.97). Criterion validity was established through correlations of each component as desire (.99), resourcefulness (.98), initiative (.97) and persistence (.97).
Eleven items related to learner autonomy relative to technological expertise as well as interaction were adapted by this researcher from instruments developed by Miltiadou and Yu (2000) and Chen (2001). Chen’s instrument consists of 23 items developed to measure learner interface (skill level), and interactions of learner-instructor, learner-learner and learner-content (structure). Validity was established by an expert panel and factor analysis. Reliability was established by Cronbach alpha for learner-learner of .87, learner-content .86, learner-interface .85 and learner-instructor .82. Miltiadou and Yu’s (2000) instrument, called the Online Technologies Self-efficacy Scale (OTSES) consist of a 29-item, 4-point Likert-type instrument that students indicated their level of confidence from “Very Confident” to “Not Very Confident”. Content validity, construct validity and reliability were established with a Cronbach alpha of .95.

The new instrument developed for this study is the Multifactor Transactional Distance Survey and has 68 Likert-type (Ary, Jacobs, Razavieh, & Sorensen, 2006) items; 48 which were designed to measure constructs of transactional distance, structure, dialogue, learner autonomy and learner experience. The remaining items were included to measure the following personal and professional demographics: age, gender, ethnicity, marital status, nursing education, nursing experience, current employment status and current scheduling/work practices. One open-ended question asked participants if they would change anything about the educational messages.

Validity

The Multifactor Transactional Distance Survey was a new researcher-developed instrument. To establish face and content validity, an expert panel consisting of doctorate or doctoral candidates in the field of nursing as well as the researcher’s dissertation committee reviewed the Multifactor Transactional Distance Survey for question clarity, structure or instrument flow. Based on this input, revisions were made to develop the final instrument.
Data Collection

At the end of the three weeks of emailed educational messages and in preparation to initiate the survey instrument, the researcher compared the list of email addresses to the human resources payroll report to ensure that the researcher only sent a survey to RNs that continued to be currently employed and to the frontline RNs whose Nurse Managers participated. According to Hair, Anderson, Tatham and Black (1998), the minimum observations for each analyzed variable should be five. Since the Multifactor Transactional Distance Survey contains 48 items to measure transactional distance, the goal was estimated to be at least 240 respondents from the total census.

The Multifactor Transactional Distance Survey was administered via Zoomerang, an online survey system, using guidelines for surveys outlined by Dillman, Smyth and Christian (2009). Multiple contacts are recommended. The first step was to send an emailed letter from the researcher to each participant that thanked them for participating in the emailed educational messages, provided information regarding the culmination of the emailed educational message study period, and a pre-notice that each participant should expect to receive a survey in a few days to evaluate the educational messages (Appendix J). A few days later, a cover letter (Appendix K) was sent with the actual survey (link) that reiterated the study purpose, explained the importance of feedback from frontline staff, provided instructions for completing the survey, reiterated the importance of prompt response, assured the participant that confidentiality guidelines will be followed throughout the survey, set a deadline for response and described a response incentive of a random drawing for $75 cash. Informed consent was be implied by completion of the survey.

One week after the survey was distributed, a replacement survey message (Appendix L) was sent to non-responding participants reminding them of the importance of their participation
to the success of the study, confidentiality of the survey responses, and the incentive cash drawing. Two weeks after the survey was distributed, a message was sent to the non-responders that announced the winner of the $75 cash drawing and that another cash drawing in the amount of $25 would be announced in one week (Appendix M). The participants were reminded of the importance of their participation to the success of the study. The survey was closed after three weeks because even after reminder messages and incentives, the last week of the survey resulted in only a few respondents. The data collection process resulted in a total of 103 responses or a 24.4% response rate. The responses by response wave are illustrated in Table 1.

Table 1
Response Rates by Waves

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<tbody>
<tr>
<td>First invitation</td>
<td>69</td>
<td>70.0</td>
</tr>
<tr>
<td>Second invitation</td>
<td>26</td>
<td>25.2</td>
</tr>
<tr>
<td>Third invitation</td>
<td>8</td>
<td>7.8</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Non-Responders.** In a non-random survey, non-responders can bias the survey data results. Non-response error occurs when the non-responders differ from the responders in a way that is important to the study (Ary et al., 2006; Dillman et al., 2009; Linder, Murphy & Briers, 2001). One method to address the non-response error rate as a threat to external validity is to compare early responders to late responders on survey results of primary variables of interest (Ary et al., 2006; Linder et al., 2001). If no differences are found between the early and late responders, and late respondents are believed to be typical of non-respondents; then the respondents can be considered an unbiased sample of the target population and results can be
generalized to the target population. For this study, late responders were defined as the last 25 respondents. The Independent Samples t-test was used to compare the means scores of the respondents to the non-respondents on the overall transactional distance scale score. No significant differences were found between the early responders ($n = 74, M = 2.993$) and late responders ($n = 25, M = 3.00$). Thus, the respondents are assumed to be an unbiased sample of the target population.

**Data Summary and Analysis**

Data collected in this study were statistically analyzed as described for each objective using a statistical software package as follows:

**Objective 1**

Objective 1 was descriptive in nature and was analyzed using descriptive statistical techniques. Frontline RNs working in patient care departments of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week were described on the following demographic variables: age, gender, ethnicity, marital status, highest nursing degree obtained, years of experience as a RN, employment status (e.g. full-time, part-time, relief), type of unit categorized: (e.g. specialty unit, medical surgical), primary shift scheduled to work, primary day of week scheduled, typical number of days per week scheduled, and typical number of hours per day scheduled. These variables were described using frequencies and percentages in each category. In addition, means and standard deviations of the interval variables of age and years of experience as a RN were calculated and reported.

**Objective 2**

Objective 2 was descriptive in nature and analyzed using descriptive statistical techniques. Nurse Managers that supervised frontline RNs working in patient care units of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours
a day 7 days a week on the following demographics: age, gender, years of experience as a RN, years of experience as a Nurse Manager and current management span of control as measured by type of unit, number of patient care departments, number of campuses department(s) located, number of licensed patient care beds/procedure rooms, number of RN employees and number of full-time equivalents. Categorical variables were described using frequencies and percentages in each category. In addition, means and standard deviations of the interval variables of age, years of experience as a RN, years of experience as a Nurse Manager, number of RN employees and number of full-time equivalents were calculated and reported.

**Objective 3**

Objective 3 was descriptive in nature and was analyzed through summation and calculations of means and standard deviations of the 48 items on the *Multifactor Transactional Distance Survey* determined to measure structure, dialogue and learner autonomy as constructs of transactional distances as well as learner experience.

Exploratory factor analysis was conducted using the principle axis factoring extraction technique and a Promax (oblique) rotation to identify variables determined to be emergent indicators of transactional distance. Items were considered meaningful when they exceed .40 (Floyd & Widaman, 1995). Several tests were conducted prior to running the EFA to determine if the data was appropriate for Factor Analysis. The first was the correlation matrix. A visual exam of the correlation matrix was conducted to see if there were sufficient correlations to support a factor analysis. The correlation matrix summarizes the interrelationships among the variables. The correlations range from -1.0 to +1.0 with values closer to one in either direction indicating a strong positive or negative relationship between variables. A substantial number of correlations should be greater than .30. Next, a Bartlett’s Test of Sphericity was conducted to evaluate the statistical probability that the correlation matrix has significant correlations among
variables. It tests the null hypothesis that the correlation matrix is an identity matrix; and the null hypothesis is rejected with larger values of the Bartlett’s test. Last, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was conducted. Values above .60 indicate Factor Analysis is appropriate. The Cronbach’s Alpha reliability test was conducted to measure the internal consistency of the survey items.

Objective 4

Objective 4 was to examine the relationships between transactional distance as measured by the Multifactor Transactional Distance Survey and the following selected demographic characteristics of frontline RNs working in an acute care hospital located in the Southeastern region of the U.S. that is staffed 24 hours a day 7 days a week: type of unit, current employment status, current primary shift scheduled to work, current primary day of week scheduled and current typical number of days per week scheduled.

The variables type of unit, employment status, primary shift scheduled to work, typical number of days per week scheduled, and primary day of week scheduled are categorical data and were analyzed using the analysis of variance (ANOVA) test.

Objective 5

Objective 5 was to determine if a model existed which explained a significant portion of the variance of transactional distance as measured by the Multifactor Transactional Distance Survey independent variables that emerge statistically following a factor analysis of the dataset and selected demographic characteristics of age, RN years of experience, gender, type of unit, employment status, primary shift scheduled to work, primary day of week scheduled and typical number of days per week scheduled. Objective 5 was measured through multiple regression analysis using the stepwise entry method.
CHAPTER 4

RESULTS

The primary purpose of this study was to determine the effect of disseminating educational messages via email from Nurse Managers to their frontline RNs working in an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week. Results of the five objectives are discussed.

Objective 1

Objective 1 was to describe frontline RNs working in patient care departments of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following demographics:

a. Age  

b. Gender  

c. Ethnicity  

d. Marital status  

e. Highest nursing degree obtained  

f. Years of experience as a RN  

g. Employment status (e.g. full-time, part-time, relief)  

h. Type of unit categorized: (e.g. Intensive care, medical surgical)  

i. Primary shift scheduled to work  

j. Primary day of week scheduled  

k. Typical number of days per week scheduled  

l. Typical number of hours per day scheduled
Age

Participants were asked to provide their age at their last birthday which were then grouped into the following categories: 1) 20-29; 2) 30-39; 3) 40-49; 4) 50-59 and 5) 60 and above. Ages ranged from a minimum of 23 years to a maximum of 64 years of age. The mean age was 39.6 years of age, the median age was 40 years of age and the standard deviation was 10.96 years. Table 2 illustrates the age distribution of respondents.

Table 2
Age Distribution of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>n(^a)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>27</td>
<td>27.8</td>
</tr>
<tr>
<td>30-39</td>
<td>20</td>
<td>20.7</td>
</tr>
<tr>
<td>40-49</td>
<td>27</td>
<td>27.8</td>
</tr>
<tr>
<td>50-59</td>
<td>19</td>
<td>19.6</td>
</tr>
<tr>
<td>60 and above</td>
<td>4</td>
<td>4.1</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(^a\)Six respondents failed to respond to the Age item on the survey.

Gender

The study participants were described on the variable “Gender”. The majority of respondents indicated their gender as female (\(n = 90, 92\%\)) while eight respondents (8%) indicated their gender as male. Five respondents failed to indicate gender on the survey.

Ethnicity

Respondents were also described on the variable “Ethnicity”. The majority of respondents reported themselves as Caucasians (\(n = 82, 84\%\)). Fifteen participants (15%)
indicated their ethnicity as African American. One participant (1%) described themselves as other. Five respondents failed to respond to their ethnic background.

**Marital Status**

The majority of respondents \((n = 68, 68\%)\) reported themselves as married. Sixteen (16%) of the respondents indicated that they were single. Table 3 illustrates the data representing marital status of the participants.

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>(n^a)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>67</td>
<td>69.8</td>
</tr>
<tr>
<td>Single</td>
<td>15</td>
<td>15.6</td>
</tr>
<tr>
<td>Divorced</td>
<td>7</td>
<td>7.3</td>
</tr>
<tr>
<td>Cohabitating</td>
<td>3</td>
<td>3.1</td>
</tr>
<tr>
<td>Widowed</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td>Separated</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>96</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*aSeven respondents failed to respond to the Marital Status item on the survey.*

**Highest Nursing Degree Obtained**

Regarding the highest level of nursing education attained by the respondents, the largest group \((n = 46, 47.4\%)\) reported completing a Bachelor’s degree in Nursing. The second largest group \((n = 28, 28.8\%)\) reported completion of an Associate degree in nursing. Table 4 illustrates the highest level of nursing education completed by the respondents.
Table 4
Highest Level of Nursing Education Reported by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th>Nursing Education</th>
<th>n(^a)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Degree</td>
<td>28</td>
<td>28.8</td>
</tr>
<tr>
<td>Diploma Degree</td>
<td>18</td>
<td>18.6</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>46</td>
<td>47.4</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>5</td>
<td>5.2</td>
</tr>
<tr>
<td>Doctorate</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(^a\) Seven respondents failed to respond to the Highest Nursing Education completed item on the survey.

Years of Experience as a RN

Respondents were asked to indicate their years of experience as a RN. The range was from a minimum of six months (n = 2, 2%) to a maximum of 42 years (n = 1, 1%). The mean years of RN experience was 10.98 years and a standard deviation of 10.43 years. Most reported less than five years of experience (n = 36, 37.1%) and only three (3.1%) report greater than 40 years of experience. Table 5 illustrates the data regarding the years of RN experience.

Table 5
Years of Experience of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th>Experience in Years</th>
<th>n(^a)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>.5 – 4.9</td>
<td>36</td>
<td>37.1</td>
</tr>
<tr>
<td>5.0 – 9.9</td>
<td>16</td>
<td>16.5</td>
</tr>
<tr>
<td>10.0 – 14.9</td>
<td>14</td>
<td>14.4</td>
</tr>
</tbody>
</table>

(Table Continued)
15.0 – 19.9   9   9.3
20.0 – 29.9   13  13.4
30.0 – 39.9   6   6.2
≥ 40         3   3.1

Total         97  100.0

^Six respondents failed to respond to the Years of Experience as a RN item on the survey.

**Employment Status**

Respondents were also asked to report their current employment status. The majority of the respondents (n = 69, 71.1%) indicated that they work full time. Twenty-one respondents (21.7%) reported working part time. Table 6 illustrates data regarding employment status of the respondents.

Table 6
Employment Status Reported by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>n^a</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Time</td>
<td>69</td>
<td>71.1</td>
</tr>
<tr>
<td>Part Time</td>
<td>21</td>
<td>21.7</td>
</tr>
<tr>
<td>Relief, PRN</td>
<td>7</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Total         97  100.0

^Six respondents failed to respond to the Employment Status item on the survey.

**Type of Unit**

Respondents were asked to identify whether they worked on a general medical surgical unit or a specialty unit (e.g. intensive care). Forty-two respondents (43.3%) reported that they
worked on a general medical-surgical unit and 55 respondents (56.7%) reported that they worked in a specialty unit. Six respondents failed to answer the “Type of Unit” question.

**Primary Shift Scheduled to Work**

The majority of respondents reported that they were primarily scheduled to work the day shift ($n = 69, 71.1\%$). The second largest group reported that they worked the night shift ($n = 20, 20.6\%$). Six respondents failed to report the “Primary Shift Scheduled to Work”. Table 7 illustrates the data reported by the respondents on the primary shift scheduled to work.

**Table 7**

Primary Shift Scheduled to Work Reported by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th>Primary Shift Scheduled to Work</th>
<th>$n^a$</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td>69</td>
<td>71.1</td>
</tr>
<tr>
<td>Nights</td>
<td>20</td>
<td>20.6</td>
</tr>
<tr>
<td>Evenings</td>
<td>6</td>
<td>6.2</td>
</tr>
<tr>
<td>Rotate</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$^a$Six respondents failed to respond to the Primary Shift Worked item on the survey.

**Primary Day of the Week Scheduled**

The majority ($n = 46, 47.4\%$) of the respondents indicated that they rotate between working during the week and the weekend. Thirty-seven (38.1\%) of the respondents reported that they worked primarily during the week. There were 14 (14.5\%) respondents that reported that they worked primarily just weekends. Six respondents failed to report the “Primary Day of the Week Worked”.
Number of Days per Week Scheduled

Respondents were asked to report the “typical number of days per week scheduled”. The majority of respondents ($n = 54, 55.7\%$) reported that they worked three days a week. Seven respondents (7.2\%) reported that they typically worked one day a week. Table 8 illustrates the data on the typical number of days the respondents worked. Six respondents failed to report the “Typical Number of Days per Week Scheduled”.

Table 8
Typical Number of Days Scheduled per Week of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th>Number of Days per Week Scheduled</th>
<th>$n^a$</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>7.2</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>11.3</td>
</tr>
<tr>
<td>3</td>
<td>54</td>
<td>55.7</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>9.3</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td>16.5</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$^a$Six respondents failed to respond to the Typical Number of Days per week Scheduled item on the survey.

Primary Number of Hours per Day Scheduled

The majority ($n = 65, 67\%$) of the nurses reported that they typically are scheduled to work 12 hours per day. Twenty-six respondents (26.8\%) reported typically working eight hours a day, six respondents (6.2\%) selected “other” and another six respondents failed to report the typical number of hours per day scheduled.
Objective 2

Objective 2 was to describe Nurse Managers that supervised frontline RNs working in patient care departments of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following demographics:

a. Age
b. Gender
c. Years of experience as a RN
d. Years of experience as a Nurse Manager
e. Current management span of control as measured by responsibility for the following:
   i. Number of patient care departments
   ii. Number of campuses department(s) located
   iii. Number of licensed patient care beds / procedure rooms
   iv. Number of RN employees
   v. Number of full-time equivalents

Age

Ages for the Nurse Managers participating in the study ranged from a minimum of 33 years of age to a maximum of 55 years of age. The mean age was 44.2 years of age with a standard deviation of 7.72 years of age. The median age was 42 years of age.

Gender

The majority of the Nurse Managers that participated (n = 15, 93.8%) were female and one Nurse Manager (6.2%) was male.

Years of Experience as a RN

The Nurse Manager,s “Years of Experience as a RN” of those participating ranged from a minimum of six years to a maximum of 30 years of RN experience. The mean Nurse Manager
years of experience as a RN was 16.75 years with a standard deviation of 8.63 years. The median years of experience as a RN of Nurse Managers that participated was 14.50 years.

**Years of Experience as a Nurse Manager**

Nurse Managers that participated had a mean of 4.69 years of experience as a Nurse Manager with a standard deviation of 4.21 years. The median years of experience as a Nurse Manager was 3.50 years with a minimum of one year and a maximum of 15 years.

**Nurse Manager Span of Control Measured by Number of Patient Care Units**

Fifty percent of the Nurse Managers \((n = 8)\) had one patient care unit to manage. Another 37.5% \((n = 6)\) had two patient care units to manage while two Nurse Managers (12.5%) had three patient care units to manage. Table 9 illustrates the data on Nurse Manager Span of Control measured by the number of patient care units.

<table>
<thead>
<tr>
<th>Number of Units</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>50.0</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Nurse Manager Span of Control Measured by Number of Campuses Departments Located**

Of the eight Nurse Managers that have more than one unit, two (25%) had patient care units located on two separate campuses. Six (75%) of the Nurse Managers that were responsible for more than one unit had units located on one campus.
Nurse Manager Span of Control Measured by Number of Licensed Beds/Procedure Rooms

Nurse Managers participating in the study were responsible for a minimum of eight licensed beds/procedure rooms and a maximum of 60 licensed beds/procedure rooms. The mean number of licensed beds/procedure rooms Nurse Managers were responsible for was 29.3 with a standard deviation of 12.9 licensed beds/procedure rooms.

Nurse Manager Span of Control Measured by Number of RN Employees

Nurse Managers that participated in the study had a mean of 36.6 RNs reporting directly to them with a standard deviation of 18.9 RNs. Nurse Managers had a minimum of 17 RN employees reporting to them and a maximum of 88 RN employees.

Nurse Manager Span of Control Measured by Number of Full Time Equivalents (FTEs)

Nurse Managers had a minimum of 28 FTEs reporting to them and a maximum of 97 FTEs reporting directly to them. The mean number of FTEs Nurse Managers had reporting to them was 48.6 FTEs with a standard deviation of 19.5 FTEs.

**Objective 3**

Objective 3 was to describe frontline RNs working in units of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following characteristics as measured by the *Multifactor Transactional Distance Survey*:

a. Structure (as a construct of transactional distance)

b. Dialogue (as a construct of transactional distance)

c. Learner autonomy (as a construct of transactional distance)

d. Transactional distance

e. Learner experience
As part of the analysis, the means and standard deviations of the responses to each of the 48 items identified to transactional distance were analyzed. The construct “structure” was measured by 13 questions on a 4-point Likert-type scale that was measured by “strongly disagree”, “disagree”, “agree” or “strongly agree”. The following scale was created by the researcher to aid in the interpretation of the responses: 1.0 – 1.75 = strongly disagree, 1.76 – 2.50 = disagree, 2.51 – 3.25 = agree, and 3.26 – 4.0 = strongly agree. The question that received the highest score was “The educational messages were clearly presented” with a mean of 3.18 (SD = .61) followed by “The educational messages were available to me anytime” with a mean of 3.18 (SD = .72). Using the interpretive scale, both were in the “agree” range. The item with the lowest level of agreement for structure was “The educational messages included frequently asked questions or equivalent” with a mean of 2.80 (SD = .65). The item with the second lowest score was “The educational messages contained graphics relevant to the material” with a mean of 2.84 (SD = .62). The response to both items fell within the “agree” range. Overall, the responses fell in the “agree” range. Table 10 illustrates the mean scores, standard deviations and levels for each item.

Table 10
Description of the Level of Agreement of Frontline Registered Nurses Working in an Acute Care Facility that Provide Services 24 hours a Day 7 Days a Week with Statements Reflecting the Structure of Educational Messages (EMs) sent via Email from the Nurse Manager

<table>
<thead>
<tr>
<th>Items</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>The EMs were clearly presented</td>
<td>101</td>
<td>3.18</td>
<td>.607</td>
<td>Agree</td>
</tr>
<tr>
<td>The EMs were available to me anytime</td>
<td>100</td>
<td>3.18</td>
<td>.716</td>
<td>Agree</td>
</tr>
<tr>
<td>The EMs indicated who to contact if I had questions</td>
<td>101</td>
<td>3.08</td>
<td>.703</td>
<td>Agree</td>
</tr>
<tr>
<td>The EMs indicated an effective start date when applicable</td>
<td>99</td>
<td>3.03</td>
<td>.597</td>
<td>Agree</td>
</tr>
</tbody>
</table>

(Table Continued)
The EMs were easily applied & 100 & 3.02 & .586 & Agree  
The EMs contained examples to support the content & 101 & 3.02 & .565 & Agree  
The EMs included rationale of evidence to support change & 99 & 3.00 & .589 & Agree  
The EMs contained clear expectations from Nurse Manager & 101 & 2.99 & .700 & Agree  
The EMs met my needs & 100 & 2.98 & .651 & Agree  
The EMs provided additional references & 99 & 2.94 & .620 & Agree  
The EMs contained directions for documentation & 100 & 2.90 & .595 & Agree  
The EMs contained graphics relevant to the material & 99 & 2.84 & .618 & Agree  
The EMs included frequently asked questions or equivalent & 99 & 2.80 & .654 & Agree  

\(^a\)Mean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree  
\(^b\)Interpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly Agree

The construct “dialogue” was measured by eight questions on a 4-point anchored scale that was measured by “never”, “rarely”, “occasionally” or “regularly”. The following scale was created by the researcher to aid in the interpretation of the responses: 1.0 – 1.75 = never, 1.76 – 2.50 = rarely, 2.51 – 3.25 = occasionally, and 3.26 – 4.0 = regularly. The question that received the highest score was “Nurse Manager was available in person or by phone if needed” with a mean of 3.64 (SD = .67) followed by “Emails were responded to timely by Nurse Manager” with a mean of 3.34 (SD = 1.01). Using the interpretive scale, both were in the “regularly” range. The item with the lowest score was “I communicated with my Nurse Manager about the educational messages” with a mean of 2.43 (SD = 1.02). The item with the second lowest score was “There was personal meaningful dialogue with Nurse Manager” with a mean of 2.76 (SD = 1.06). The response to both items fell within the “occasionally” range. Overall, the responses fell in the
“occasionally” range. Table 11 illustrates the mean scores, standard deviations and level for each item.

Table 11
Description of the Level of Dialogue of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 hours a day 7 days a Week with Statements Reflecting the Dialogue Related to Educational Messages (EMs) sent via Email from the Nurse Manager (NM)

<table>
<thead>
<tr>
<th>Items</th>
<th>n</th>
<th>M&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SD</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>NM was available in person or by phone if needed</td>
<td>101</td>
<td>3.64</td>
<td>.672</td>
<td>Regularly</td>
</tr>
<tr>
<td>Emails were responded to timely by NM</td>
<td>97</td>
<td>3.34</td>
<td>1.019</td>
<td>Regularly</td>
</tr>
<tr>
<td>Feedback to the NM was encouraged</td>
<td>101</td>
<td>3.24</td>
<td>.885</td>
<td>Occasionally</td>
</tr>
<tr>
<td>Feedback to my co-workers was encouraged</td>
<td>102</td>
<td>3.21</td>
<td>.998</td>
<td>Occasionally</td>
</tr>
<tr>
<td>Feedback from the NM was timely</td>
<td>98</td>
<td>3.14</td>
<td>1.035</td>
<td>Occasionally</td>
</tr>
<tr>
<td>I communicated with my co-workers about the EMs</td>
<td>100</td>
<td>2.82</td>
<td>1.048</td>
<td>Occasionally</td>
</tr>
<tr>
<td>There was personal, meaningful dialogue with NM</td>
<td>98</td>
<td>2.76</td>
<td>1.056</td>
<td>Occasionally</td>
</tr>
<tr>
<td>I communicated with my NM about the EMs</td>
<td>101</td>
<td>2.43</td>
<td>1.023</td>
<td>Rarely</td>
</tr>
</tbody>
</table>

<sup>a</sup>Mean values based on a 4-point anchored response scale 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Regularly

<sup>b</sup>Interpretive scale: 1.0 – 1.75 = Never, 1.76 – 2.50 = Rarely, 2.51 – 3.25 = Occasionally, and 3.26 – 4.0 = Regularly.

The construct “learner autonomy – self efficacy” was measured by seven questions on a 4-point Likert-type scale by “strongly disagree”, “disagree”, “agree” or “strongly agree”. The following scale was created by the researcher to aid in the interpretation of the responses: 1.0 – 1.75 = strongly disagree, 1.76 – 2.50 = disagree, 2.51 – 3.25 = agree, and 3.26 – 4.0 = strongly agree. The question that received the highest score was “I would have participated in the educational series program to gain personal knowledge even if not pertinent to my everyday work” with a mean of 3.09 (SD = .58) followed by “I would have participated in the educational series program even if I had not been pressured from work” with a mean of 3.06 (SD = .59).
Using the interpretive scale, both were in the “agree” range. The item with the lowest level of learner autonomy was “I would have participated in the educational series program only if the educational messages had come from the clinical education department” with a mean of 1.98 ($SD = .54$). The item with the second lowest level of learner autonomy was “I would have participated in the educational series program even if I were on vacation” with a mean of 2.07 ($SD = .88$). Table 12 illustrates the mean scores and standard deviations for each item.

Table 12
Description of the Level of Learner Autonomy – Self-Efficacy of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week with Educational Messages sent via Email from the Nurse Manager

<table>
<thead>
<tr>
<th>Items I would have participated in the educational series program ...</th>
<th>n</th>
<th>$M^a$</th>
<th>$SD$</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>to gain personal knowledge even if not pertinent to work</td>
<td>97</td>
<td>3.09</td>
<td>.597</td>
<td>Agree</td>
</tr>
<tr>
<td>even if I had not been pressured from work</td>
<td>97</td>
<td>3.06</td>
<td>.592</td>
<td>Agree</td>
</tr>
<tr>
<td>even if I were on leave of absence</td>
<td>97</td>
<td>2.53</td>
<td>.891</td>
<td>Agree</td>
</tr>
<tr>
<td>only if I felt the information was pertinent to my work</td>
<td>96</td>
<td>2.45</td>
<td>.738</td>
<td>Disagree</td>
</tr>
<tr>
<td>only because I felt it was mandatory</td>
<td>97</td>
<td>2.13</td>
<td>.671</td>
<td>Disagree</td>
</tr>
<tr>
<td>even if I were on vacation</td>
<td>97</td>
<td>2.07</td>
<td>.881</td>
<td>Disagree</td>
</tr>
<tr>
<td>only if the EMs had come from the Clinical Education Dept</td>
<td>97</td>
<td>1.98</td>
<td>.540</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

$^a$Mean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree

$^b$Interpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly Agree.

The construct “learner autonomy – technical expertise” was measured by 11 questions on a 4-point anchored scale by “not at all confident”, “not very confident”, “somewhat confident” or “very confident”. The following scale was created by the researcher to aid in the interpretation of the responses: 1.0 – 1.75 = not at all confident, 1.76 – 2.50 = not very confident, 2.51 – 3.25 = somewhat confident, and 3.26 – 4.0 = very confident. The question that received the highest
score was “I feel confident deleting email” with a mean of 3.88 ($SD = .36$) followed by “I feel confident logging on and off email” with a mean of 3.82 ($SD = .46$). Using the interpretive scale, both were in the “very confident” range. The item with the score for autonomy – technical expertise was “I feel confident attaching a file to email, then sending the email” with a mean of 3.47 ($SD = .81$). The item with the second lowest score was “I feel confident saving attachments to file, then opening the file in a folder” with a mean of 3.51 ($SD = .81$). Table 13 illustrates the mean scores and standard deviations for each item.

Table 13
Description of the Level of Confidence of Frontline Registered Nurses Working in an Acute Care Facility that Provide Services 24 Hours a Day 7 Days a Week with Statements Reflecting Autonomy-Technical Expertise of Educational Messages sent via Email from the Nurse Manager

<table>
<thead>
<tr>
<th>Items I feel confident ...</th>
<th>$n$</th>
<th>$M^a$</th>
<th>$SD$</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>deleting email</td>
<td>97</td>
<td>3.88</td>
<td>.361</td>
<td>Very confident</td>
</tr>
<tr>
<td>logging on and off email</td>
<td>97</td>
<td>3.82</td>
<td>.457</td>
<td>Very confident</td>
</tr>
<tr>
<td>sending an email message</td>
<td>95</td>
<td>3.78</td>
<td>.509</td>
<td>Very confident</td>
</tr>
<tr>
<td>replying to an email message</td>
<td>97</td>
<td>3.77</td>
<td>.510</td>
<td>Very confident</td>
</tr>
<tr>
<td>clicking on a link to visit a specific web site</td>
<td>97</td>
<td>3.76</td>
<td>.536</td>
<td>Very confident</td>
</tr>
<tr>
<td>forwarding an email message</td>
<td>96</td>
<td>3.75</td>
<td>.523</td>
<td>Very confident</td>
</tr>
<tr>
<td>opening an attachment</td>
<td>96</td>
<td>3.70</td>
<td>.600</td>
<td>Very confident</td>
</tr>
<tr>
<td>sending emails to more than 1 person at the same time</td>
<td>97</td>
<td>3.64</td>
<td>.695</td>
<td>Very confident</td>
</tr>
<tr>
<td>creating an email address book</td>
<td>97</td>
<td>3.53</td>
<td>.779</td>
<td>Very confident</td>
</tr>
<tr>
<td>saving attachments to file, then opening in a file folder</td>
<td>96</td>
<td>3.51</td>
<td>.808</td>
<td>Very confident</td>
</tr>
<tr>
<td>attaching a file to email, then sending the email</td>
<td>96</td>
<td>3.47</td>
<td>.807</td>
<td>Very confident</td>
</tr>
</tbody>
</table>

$^a$Mean values based on a 4-point anchored response scale 1 = Not at all Confident, 2 = Not Very Confident, 3 = Somewhat Confident or 4 = Very Confident

$^b$Interpretive scale: 1.0 – 1.75 = Not at all Confident, 1.76 – 2.50 = Not Very Confident, 2.51 – 3.25 = Somewhat Confident, and 3.26 – 4.0 = Very Confident
There were two questions specific to transactional distance measured on a 4-point Likert-type scale by “strongly disagree”, “disagree”, “agree” or “strongly agree”. The following scale was created by the researcher to aid in the interpretation of the responses: $1.0 – 1.75 = \text{strongly disagree}$, $1.76 – 2.50 = \text{disagree}$, $2.51 – 3.25 = \text{agree}$, and $3.26 – 4.0 = \text{strongly agree}$. The first question was “The educational messages provided a closeness between me and my nurse manager” and had a mean of $2.63$ ($SD = .85$) falling in the agree range. The second question was “The educational messages provided a closeness between me and my co-workers” had a mean of $2.57$ ($SD = .72$) also falling in the agree range.

Learner experience was measured by seven questions on a 4-point Likert-type scale that was measured by “strongly disagree”, “disagree”, “agree” or “strongly agree”. The following scale was created by the researcher to aid in the interpretation of the responses: $1.0–1.75 = \text{strongly disagree}$, $1.76 – 2.50 = \text{disagree}$, $2.51–3.25 = \text{agree}$, and $3.26 – 4.0 = \text{strongly agree}$. The question that received the highest learner experience was “I feel comfortable using email” with a mean of $3.72$ ($SD = .52$) falling in the “strongly agree range. The item with the lowest level of learner experience was “I feel comfortable using Twitter” with a mean of $2.00$ ($SD = .95$) falling in the disagree range. Table 14 illustrates the mean scores and standard deviations for each item.

<table>
<thead>
<tr>
<th>Items “I feel comfortable using …”</th>
<th>$n$</th>
<th>$M^a$</th>
<th>$SD$</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>95</td>
<td>3.72</td>
<td>.52</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Text Message via cell phone</td>
<td>97</td>
<td>3.24</td>
<td>1.018</td>
<td>Agree</td>
</tr>
<tr>
<td>Instant Messaging via computer</td>
<td>96</td>
<td>3.10</td>
<td>.900</td>
<td>Agree</td>
</tr>
<tr>
<td>Facebook</td>
<td>96</td>
<td>2.96</td>
<td>1.065</td>
<td>Agree</td>
</tr>
</tbody>
</table>

(Table Continued)
Blog & 96 & 2.59 & .901 & Agree \\
Podcast & 97 & 2.19 & .961 & Agree \\
Twitter & 97 & 2.00 & .946 & Disagree \\

\(^a\)Mean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree

\(^b\)Interpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly Agree.

As part of learner experience, participants were also asked to choose items that they used or owned from the following: cell phone, Personal Digital Assistant (Blackberry, Palm), desktop computer, laptop computer, iPod or MP3 player and iPhone. Table 15 illustrates the percentage of participants that own each item and the percentage of items the participant uses.

Table 15
Learner Experience Reflected by Owning and/or Using a Cell Phone, Personal Digital Assistant, Desktop Computer, Laptop Computer, iPhone, iPod or MP3 Player by Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th>Items</th>
<th>Own the Device</th>
<th>Percentage Own Device</th>
<th>Use the Device</th>
<th>Percentage Use Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Phone</td>
<td>83</td>
<td>80.58</td>
<td>82</td>
<td>79.61</td>
</tr>
<tr>
<td>Laptop Computer</td>
<td>71</td>
<td>68.93</td>
<td>70</td>
<td>67.96</td>
</tr>
<tr>
<td>Desktop Computer</td>
<td>70</td>
<td>67.96</td>
<td>71</td>
<td>68.93</td>
</tr>
<tr>
<td>Music: iPod or MP3 Player</td>
<td>58</td>
<td>56.31</td>
<td>54</td>
<td>52.42</td>
</tr>
<tr>
<td>iPhone</td>
<td>37</td>
<td>35.92</td>
<td>37</td>
<td>35.92</td>
</tr>
<tr>
<td>Personal Digital Assistant</td>
<td>24</td>
<td>23.30</td>
<td>20</td>
<td>19.42</td>
</tr>
</tbody>
</table>

Note: Percentage Calculated on 103 Total Participants Answering

Then participants were asked to choose reasons they would use the Internet from the following: professional growth, personal growth, pleasure or never use Internet (Table 16).
Table 16
Reasons Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week Use the Internet

<table>
<thead>
<tr>
<th>Reasons</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Growth</td>
<td>92</td>
<td>89.32</td>
</tr>
<tr>
<td>Professional Growth</td>
<td>91</td>
<td>88.35</td>
</tr>
<tr>
<td>Pleasure</td>
<td>91</td>
<td>88.35</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: Percentage Calculated on 103 Total Participants Answering

Overall satisfaction with the educational messages was measured by four questions on a 4-point anchored scale by “not at all satisfied”, “not very satisfied”, “somewhat satisfied” and “very satisfied”. The following scale was created by the researcher to aid in the interpretation of the responses: 1.0 – 1.75 = not at all satisfied, 1.76 – 2.50 = not very satisfied, 2.51 – 3.25 = somewhat satisfied, and 3.26 – 4.0 = very satisfied. Table 17 illustrates the mean scores, median and standard deviations for each item.

Table 17
Overall Satisfaction with Educational Messages Sent to Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M</th>
<th>Median</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction with Delivery of Educational Messages Electronically</td>
<td>97</td>
<td>3.41</td>
<td>4.00</td>
<td>.732</td>
<td>Very Satisfied</td>
</tr>
<tr>
<td>Satisfaction with Applicability of Educational Messages to Nursing Practice</td>
<td>98</td>
<td>3.34</td>
<td>3.00</td>
<td>.657</td>
<td>Very Satisfied</td>
</tr>
<tr>
<td>Satisfaction with Knowledge Gained From the Educational Messages</td>
<td>98</td>
<td>3.18</td>
<td>3.00</td>
<td>.737</td>
<td>Somewhat Satisfied</td>
</tr>
<tr>
<td>Satisfaction with Learning Gained from Discussions with Co-Workers</td>
<td>96</td>
<td>2.91</td>
<td>3.00</td>
<td>.834</td>
<td>Somewhat Satisfied</td>
</tr>
</tbody>
</table>

\[a\] Mean values based on a 4-point anchored response scale 1 = Not at all Satisfied, 2 = Not Very Satisfied, 3 = Somewhat Satisfied, 4 = Very Satisfied

\[b\] Interpretive scale: 1.0 – 1.75 = Not at all Satisfied, 1.76 – 2.50 = Not Very Satisfied, 2.51 – 3.25 = Somewhat Satisfied, and 3.26 – 4.0 = Very Satisfied.
Factor analysis procedures were conducted to investigate underlying correlation of the 48 variables determined to be emergent indicators of transactional distance. A correlation matrix was created and visually inspected which showed that a substantial number of correlations were > .30. It was also observed that there were a number of questions that were highly correlated. All correlations > .7 were further analyzed resulting in the researcher decision to eliminate six highly correlated questions. Most of these questions referred to the confidence of using email.

Table 18 summarizes the highly correlated questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>35. I feel confident logging on and off email</td>
<td>.766</td>
</tr>
<tr>
<td>36. I feel confident sending an email message</td>
<td>.781</td>
</tr>
<tr>
<td>37. I feel confident replying to an email message</td>
<td>.766</td>
</tr>
<tr>
<td>38. I feel confident forwarding an email message</td>
<td>.778</td>
</tr>
<tr>
<td>44. I feel confident attaching a file to email, then sending the email</td>
<td>.769</td>
</tr>
<tr>
<td>45. I feel confident clicking on a link to visit a specific web site</td>
<td>.721</td>
</tr>
<tr>
<td>47. I feel comfortable using email</td>
<td>.705</td>
</tr>
</tbody>
</table>

(Table Continued)
39. I feel confident sending emails to more than 1 person at the same time.

40. I feel confident deleting email

42. I feel confident opening an attachment

43. I feel confident saving attachments to file, then opening file in folder

45. I feel confident clicking on a link to visit a specific web site

47. I feel comfortable using email

As a result, the following highly correlated (> .70) questions were eliminated:

1. Question 35: I feel confident logging on and off email

2. Question 37: I feel confident replying to an email message

3. Question 38: I feel confident forwarding an email message
4. Question 44: I feel confident attaching a file to email, then sending the email

5. Question 45: I feel confident clicking on a link to visit a specific web site

6. Question 47: I feel comfortable using email

After removing six of the 48 questions the mean and standard deviation for the overall Transactional Distance Scale (containing 42 questions) was analyzed. The mean was 2.95 and the standard deviation was .384. Using the 42 remaining questions determined to be emergent indicators of transactional distance, a visual inspection of the correlation matrix was deemed acceptable as most of the correlations were > .3. The Bartlett’s Test of Sphericity was also found to be acceptable (2666.278; df = 861; p < .001). The KMO Measure of Sampling Adequacy returned an acceptable score of .771. The data was thus deemed factorable.

Common Factor Analysis with Principle Axis Factoring extraction method was conducted using the 42 variables identified as indicators of transactional distance. Promax (Oblique) rotation method with Kaiser Normalization was undertaken to obtain a Pattern Matrix. To determine the number of factors to be extracted, the researcher examined the Cattell Scree plot, the Kaiser Criteria with eigenvalue > 2.0 and the percentage of variance criterion (percentage of total variance extracted by successive factors > 5%).

Factor analysis yielded four factors with eigenvalues greater than 2.0 which explained 55.13% of the total variance. An examination of the Scree Plot revealed four factors with a substantial drop from the first factor to the second factor followed by smaller drops in factors three and four. Figure 1 illustrates four factors identified in the Cattell Scree Plot.
Ten variables with loadings ranging from .920 to .423 were noted to load on factor one. Ten variables loaded on factor two with numerical loading values noted to range from .745 to .428. Factor three contained six variables with loadings ranging from .938 to .654. The fourth factor also contained six variables with loadings that ranged from .782 to .457. There were no variables that crossloaded above the .40 loading. The four factors were determined to best represent the overall transactional distance construct. They were easily identified and labeled by the researcher as: Factor 1 Dialogue, Factor 2 Structure, Factor 3 Autonomy and Factor 4 Learner Experience. Table 19 summarizes the factor loadings, eigenvalues and variance explained for the four factors.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 Dialogue</th>
<th>Factor 2 Structure</th>
<th>Factor 3 Autonomy</th>
<th>Factor 4 Learner Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>There was personal meaningful dialogue with Nurse Manager</td>
<td>.920</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Table Continued)
I communicated with my Nurse Manager about the educational messages. The educational messages provided a closeness between me and my Nurse Manager.

Feedback to Nurse Manager was encouraged.

Feedback to co-workers was encouraged.

Feedback from Nurse Manager was timely.

Emails were responded to timely by Nurse Manager.

Nurse Manager was available in person or by phone if needed.

The educational messages provided a closeness between me and my co-workers.

I communicated with my co-workers about the educational messages.

The educational messages were easily applied.

The educational messages contained examples to support the content.

The educational messages included rationale or evidence to support change.

The educational messages indicated an effective start date when applicable.

The educational messages contained clear expectations from my Nurse Manager.

The educational messages met my needs.

The educational messages indicated who to contact if I had questions.

The educational messages were available to me anytime.

(Table Continued)
The educational messages provided additional references .441

The educational messages were clearly presented .428

I feel confident sending an email message .938
I feel confident opening an attachment .879
I feel confident creating an email address book .765
I feel confident deleting email .747
I feel confident sending emails to more than one person at the same time .685
I feel confident saving attachments to file, then opening the file in folder .654
I feel comfortable using Podcast .782
I feel comfortable using a blog .727
I feel comfortable using Twitter .721
I feel comfortable using facebook .704
I feel comfortable using instant messaging via computer .635
I feel comfortable using text message via cell phone .457

| Eigenvalues   | 12.01 | 5.62 | 3.43 | 2.11 |
|              | 28.59 | 13.37 | 8.16 | 5.02 |

Note: Only loadings of ≥ .4 are included in the table.

Internal consistency of the 42 items of the total transactional distance scale was analyzed at a Cronbach’s Alpha of .929. In addition, since four factors were identified, the reliability of each sub-scale was also computed using the Cronbach’s Alpha internal consistency measure. The estimate of the reliability for each factor is summarized in Table 20.
Objective 4

Objective 4 is to examine the relationships between selected demographic characteristics of frontline RNs working in an acute care hospital located in the Southeastern region of the U.S. that is staffed 24 hours a day 7 days a week and transactional distance as measured by the Multifactor Transactional Distance Survey.

a. Gender

b. Type of unit

c. Current employment status (e.g. full-time, part-time, relief)

d. Current primary shift scheduled to work

e. Current primary day of week scheduled

f. Current typical number of days per week scheduled

Gender

A comparison of the overall transactional distance scale score between males and females was undertaken through calculation of one way ANOVA. Although there were only nine males to the 88 females of the respondents, the mean item score for males and females were almost the same as reflected in Table 21.
Table 21
Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviation by Gender for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>M&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>88</td>
<td>2.99</td>
<td>.25</td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>2.96</td>
<td>.40</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>2.97</td>
<td>.39</td>
</tr>
</tbody>
</table>

<sup>a</sup>Mean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree

<sup>b</sup>Interpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly Agree.

Results from the Levene’s Test of Homogeneity of Variance revealed the presence of equal variance between the gender groups ($F_{1,95} = 1.53, p = .22$). The differences in overall transactional distance between gender groups were not statistically different ($F_{1,95} = .099, p = .753$). Table 22 illustrates the ANOVA results for differences gender.

Table 22
One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Gender for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from Nurse Manager

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>$F^a$</th>
<th>$p^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>.016</td>
<td>.015</td>
<td>.099</td>
<td>.753</td>
</tr>
<tr>
<td>Within Groups</td>
<td>95</td>
<td>14.26</td>
<td>.150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>14.28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>One Way Analysis of Variance

<sup>b</sup>Significance for the two-tailed at .05
Type of Unit

A comparison of the overall transactional distance scale score between medical surgical units and specialty units was analyzed through calculation of the ANOVA. The sample sizes, means and standard deviations are illustrated in Table 23.

Table 23
Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviation by Type of Unit for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 hours a day 7 days a week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Type of Unit</th>
<th>n</th>
<th>M&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical-Surgical</td>
<td>41</td>
<td>2.96</td>
<td>.362</td>
</tr>
<tr>
<td>Specialty</td>
<td>55</td>
<td>2.96</td>
<td>.409</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>2.96</td>
<td>.388</td>
</tr>
</tbody>
</table>

<sup>a</sup>Mean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree

<sup>b</sup>Interpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly Agree.

Results from the Levene’s Test of Homogeneity of Variance revealed the presence of equal variance between the types of units groups ($F_{1,94} = .772$, $p = .382$). The differences in overall transactional distance between the types of units were not statistically different ($F_{1,94} = .000$, $p = .992$). Table 24 illustrates the ANOVA results for differences in transactional distance by type of unit.

Table 24
One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Type of Unit for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>$F&lt;sup&gt;a&lt;/sup&gt;$</th>
<th>$p&lt;sup&gt;b&lt;/sup&gt;$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.992</td>
</tr>
</tbody>
</table>

| Between Groups | 1 | .000 | .000 | .000 | .992 |

(Table Continued)
Within Groups     94  14.28  .152
Total              95  14.28

a One Way Analysis of Variance
b Significance for the two-tailed at .05

**Employment Status**

Table 25 illustrates a comparison of the overall transactional distance scale score between frontline RNs who work full time, part time, or relief staff was analyzed through calculation of the ANOVA.

Table 25
Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviations by Employment Status for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>n</th>
<th>M&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>68</td>
<td>3.00</td>
<td>.347</td>
</tr>
<tr>
<td>Part-time</td>
<td>21</td>
<td>2.83</td>
<td>.487</td>
</tr>
<tr>
<td>Relief, PRN</td>
<td>7</td>
<td>2.98</td>
<td>.409</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>2.96</td>
<td>.388</td>
</tr>
</tbody>
</table>

<sup>a</sup>Mean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree
<sup>b</sup>Interpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly Agree.

The Levene’s Test of Homogeneity of Variance revealed the presence of equal variance between the frontline RN’s employment status ($F_{2,93} = 2.10, p = .128$). The differences in overall transactional distance between the frontline RN’s employment status were not statistically different ($F_{2,93} = 1.486, p = .232$) as presented in Table 26.
Table 2
One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Employment Status for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F&lt;sup&gt;a&lt;/sup&gt;</th>
<th>p&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.442</td>
<td>.221</td>
<td>1.486</td>
<td>.232</td>
</tr>
<tr>
<td>Within Groups</td>
<td>93</td>
<td>13.834</td>
<td>.149</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>95</td>
<td>14.276</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> One Way Analysis of Variance
<sup>b</sup> Significance for the two-tailed at .05

Primary Shift Scheduled to Work

A comparison of the overall transactional distance scale score between frontline RNs who work days, evenings, nights or rotate shifts was analyzed through calculation of the ANOVA. The sample sizes, means and standard deviations are illustrated in Table 27.

Table 27
Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviations by Primary Shift Scheduled for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Primary Shift Scheduled to Work</th>
<th>n</th>
<th>M&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td>68</td>
<td>3.04</td>
<td>.379</td>
</tr>
<tr>
<td>Evenings</td>
<td>6</td>
<td>2.74</td>
<td>.382</td>
</tr>
<tr>
<td>Nights</td>
<td>20</td>
<td>2.79</td>
<td>.308</td>
</tr>
<tr>
<td>Rotate</td>
<td>2</td>
<td>2.44</td>
<td>.481</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>2.96</td>
<td>.388</td>
</tr>
</tbody>
</table>

<sup>a</sup>Mean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree
<sup>b</sup>Interpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly agree.
The Levene’s Test of Homogeneity of Variance revealed the presence of equal variance between the frontline RN’s by primary shift worked ($F_{3,92} = .264, p = .851$). The differences in overall transactional distance between the frontline RN’s primary shift worked were statistically different ($F_{3,92} = 4.602, p = .005$). Table 25 illustrates the ANOVA results for differences in transactional distance frontline RN’s primary shift worked.

Table 25
One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Primary Shift Scheduled for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>$F^a$</th>
<th>$p^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>3</td>
<td>1.863</td>
<td>.621</td>
<td>4.602</td>
<td>.005</td>
</tr>
<tr>
<td>Within Groups</td>
<td>92</td>
<td>12.413</td>
<td>.135</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>95</td>
<td>14.276</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$ One Way Analysis of Variance

$^b$ Significance for the two-tailed at .05

The Tukey post hoc analysis was conducted to identify significant differences between the means. Tukey post hoc analysis warned that group sizes were unequal. There were significant difference between nurses that worked days ($M = 3.04, 95\% \text{ CI} [2.95, 3.17]$) and those who rotated shifts ($M = 2.44, 95\% \text{ CI} [-1.88, 6.75]$). Nurses that worked days had a higher mean Transactional Distance Scale score than nurses who rotated shifts. Comparisons between the other shifts indicated no statistically significant difference.

**Primary Day of Week Scheduled to Work**

A comparison of the overall transactional distance scale score between frontline RNs who are primarily scheduled weekdays, weekends or rotate between weekdays and weekends was
analyzed through calculation of the ANOVA. The sample sizes, means and standard deviations are illustrated in Table 29.

Table 29
Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviations by Primary Day of Week Scheduled for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Day of Week Scheduled to Work</th>
<th>N</th>
<th>$M^a$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays</td>
<td>36</td>
<td>3.07</td>
<td>.396</td>
</tr>
<tr>
<td>Weekends</td>
<td>14</td>
<td>2.78</td>
<td>.436</td>
</tr>
<tr>
<td>Rotate</td>
<td>46</td>
<td>2.93</td>
<td>.347</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>2.96</td>
<td>.388</td>
</tr>
</tbody>
</table>

$^a$Mean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree
$^b$Interpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly Agree.

The Levene’s Test of Homogeneity of Variance revealed the presence of equal variance between the frontline RN’s by primary day of the week scheduled to work ($F_{2,93} = .593, p = .555$). The differences in overall transactional distance between the frontline RN’s primary day of the week scheduled to work were not statistically different ($F_{2,93} = 3.04, p = .053$). Table 30 illustrates the ANOVA results for differences in transactional distance frontline RN’s primary day of the week scheduled to work.

Table 30
One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Primary Day of the Week Scheduled for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week

<table>
<thead>
<tr>
<th></th>
<th>$df$</th>
<th>$SS$</th>
<th>$MS$</th>
<th>$F^a$</th>
<th>$p^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.876</td>
<td>.438</td>
<td>3.040</td>
<td>.053</td>
</tr>
</tbody>
</table>

(Table Continued)
One Way Analysis of Variance
Significance for the two-tailed at .05

Typical Number of Days per Week Scheduled to Work

A comparison of the overall transactional distance scale score between frontline RNs who are scheduled one day, two days, three days, four days, five days, six days or seven days was analyzed through calculation of the ANOVA. The sample sizes, means and standard deviations are illustrated in Table 31.

Table 31
Group Sizes, Overall Transactional Distance Mean Scores and Standard Deviation by Typical Number of Days per Week Scheduled to Work for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Number of Days per Week Scheduled to Work</th>
<th>n</th>
<th>Mᵃ</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Day</td>
<td>7</td>
<td>2.99</td>
<td>.427</td>
</tr>
<tr>
<td>Two Days</td>
<td>11</td>
<td>2.59</td>
<td>.510</td>
</tr>
<tr>
<td>Three Days</td>
<td>53</td>
<td>3.01</td>
<td>.315</td>
</tr>
<tr>
<td>Four Days</td>
<td>9</td>
<td>2.94</td>
<td>.348</td>
</tr>
<tr>
<td>Five Days</td>
<td>16</td>
<td>3.02</td>
<td>.430</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>2.96</td>
<td>.387</td>
</tr>
</tbody>
</table>

ᵃMean values based on a 4-point Likert-type type response scale 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree
ᵇInterpretive scale: 1.0 – 1.75 = Strongly Disagree, 1.76 – 2.50 = Disagree, 2.51 – 3.25 = Agree, and 3.26 – 4.0 = Strongly Agree.
The Levene’s Test of Homogeneity of Variance revealed the presence of equal variance between the frontline RN’s by typical number of days scheduled to worked ($F_{4,91} = 1.68, p = .161$). The differences in overall transactional distance between the frontline RN’s typical number of days schedule to work were statistically different ($F_{4,91} = 3.03, p = .021$). Table 32 illustrates the ANOVA results for differences in transactional distance by typical number of days per week scheduled.

Table 32
One Way Analysis of Variance Illustrating Differences in Overall Transactional Distance by Typical Number of Days per Week Scheduled to Work for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>$F^a$</th>
<th>$p^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>1.68</td>
<td>.420</td>
<td>3.03</td>
<td>.021</td>
</tr>
<tr>
<td>Within Groups</td>
<td>91</td>
<td>12.59</td>
<td>.138</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>95</td>
<td>14.28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$One Way Analysis of Variance

$^b$Significance for the two-tailed at .05

The Tukey post hoc analysis conducted to identify significant differences between the means revealed statistically significant differences between frontline RNs who typically scheduled to work five days ($M = 3.03, 95\% CI [2.79, 3.25]$) and those who typically are scheduled to work two days ($M = 2.59, 95\% CI [2.25, 2.94]$). The nurses who work five days a week had a higher mean score on the Transactional Distance Scale than those nurses who only work two days a week. Comparisons among working any other number of days were not significant.

**Objective 5**

Objective 5 is to determine if a model exists which would explain a significant portion of the variance of transactional distance as measured by the *Multifactor Transactional Distance*
Survey mean score and selected demographic characteristics of age, RN years of experience, type of unit, employment, primary shift scheduled to work, primary day of week scheduled and typical number of days per week scheduled. An overall scale score was used by the researcher versus sub-scales as the number of respondents per questions was approximately two which is lower than the minimum requirement of five respondents per question. Participant scores were summed to obtain the overall mean score for each participant and used as the dependent variable in the regression equation.

Prior to the regression analysis the data were screened for outliers using Mahalanobis distance, residual plot, and casewise diagnostics. Table 3 shows the extreme values for the Mahalanobis Distance. None of the Mahalanobis equals or exceed the Chi-square criterion (15 = df; \( p = .001, \chi^2 = 37.697 \)).

Table 3
Extreme Values for Mahalanobis Distance

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
</tr>
<tr>
<td>4</td>
<td>56</td>
</tr>
<tr>
<td>5</td>
<td>86</td>
</tr>
<tr>
<td>Lowest</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>102</td>
</tr>
<tr>
<td>2</td>
<td>91</td>
</tr>
<tr>
<td>3</td>
<td>79</td>
</tr>
<tr>
<td>4</td>
<td>61</td>
</tr>
<tr>
<td>5</td>
<td>60</td>
</tr>
</tbody>
</table>

a. Only a partial list of cases with the value .00000 are shown in the table of lower extremes

The casewise diagnostics table (Table 34) showed a residual outlier that was greater than three standard deviations. This case was deleted from the data and the data was screened again for outliers and violations to assumptions.
After removing case number 21 the data was rescreened and no violations were found.

The variables age and RN years of experience were entered into the regression as interval variables. For the categorical variables gender, type of unit, employment status, primary shift scheduled to work, primary day of week scheduled and typical number of days per week scheduled were dummy coded to prepare for the regression analysis.

The assumption of homoscedasticity was confirmed by the histogram (Figure 2) and a P-P Plot of Regression that revealed the standardized residuals that hovered around the zero line (Figure 3).

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Std. Residual</th>
<th>Without the eliminated six questions in the overall score</th>
<th>Predicted Value</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>-3.046</td>
<td>1.619</td>
<td>2.662</td>
<td>-1.043</td>
</tr>
</tbody>
</table>

Figure 2 Histogram Overall Mean of Transactional Distance
The independent variables of gender, type of unit, employment status, primary shift scheduled to work, primary day of week scheduled and typical number of days per week scheduled were entered stepwise into the regression analysis with the overall transactional distance mean score entered as the dependent variable.

A Pearson Product Moment Correlation was conducted to analyze correlations between the overall transactional distance mean scale score (dependent variable) and the independent variables of gender, type of unit, employment status, primary shift scheduled to work, primary day of week scheduled and typical number of days per week. Table 35 reflects correlations and significance levels for all variables entered into the equation as possible predictors of transactional distance. Correlations were analyzed according to Davis’s (1971) descriptors of association (.00 - .09 = negligible, .10 - .29 = low, .30 - .49 = moderate, .50 - .69 = substantial, ≥ .70 = very strong).
Table 35
Pearson Product Moment Correlations between Overall Transactional Distance and Selected Personal and Professional Characteristics of Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>r&lt;sup&gt;a&lt;/sup&gt;</th>
<th>p&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Descriptors&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Shift Scheduled-Days</td>
<td>101</td>
<td>.378</td>
<td>&lt;.001</td>
<td>Moderate</td>
</tr>
<tr>
<td>Typical Days Scheduled-Two</td>
<td>101</td>
<td>-.258</td>
<td>.005</td>
<td>Low</td>
</tr>
<tr>
<td>Primary Shift Scheduled-Nights</td>
<td>101</td>
<td>-.251</td>
<td>.006</td>
<td>Low</td>
</tr>
<tr>
<td>Age at Last Birthday</td>
<td>101</td>
<td>-.225</td>
<td>.012</td>
<td>Low</td>
</tr>
<tr>
<td>Primary Day of Week Scheduled-Weekend</td>
<td>101</td>
<td>-.215</td>
<td>.016</td>
<td>Low</td>
</tr>
<tr>
<td>Primary Day of Week Scheduled-Weekday</td>
<td>101</td>
<td>.192</td>
<td>.027</td>
<td>Low</td>
</tr>
<tr>
<td>Primary Shift Scheduled-Evenings</td>
<td>101</td>
<td>-.162</td>
<td>.053</td>
<td>Low</td>
</tr>
<tr>
<td>RN Years of Experience</td>
<td>101</td>
<td>-.151</td>
<td>.066</td>
<td>Low</td>
</tr>
<tr>
<td>Primary Days Scheduled-Three</td>
<td>101</td>
<td>.121</td>
<td>.115</td>
<td>Low</td>
</tr>
<tr>
<td>Employment Status-Part-time</td>
<td>101</td>
<td>-.113</td>
<td>.130</td>
<td>Low</td>
</tr>
<tr>
<td>Employment Status-Full-time</td>
<td>101</td>
<td>.101</td>
<td>.157</td>
<td>Low</td>
</tr>
<tr>
<td>Primary Days Scheduled-Four</td>
<td>101</td>
<td>-.026</td>
<td>.400</td>
<td>Negligible</td>
</tr>
<tr>
<td>Gender</td>
<td>101</td>
<td>-.022</td>
<td>.415</td>
<td>Negligible</td>
</tr>
<tr>
<td>Primary Days Scheduled-One</td>
<td>101</td>
<td>.014</td>
<td>.445</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

<sup>a</sup>Pearson Product Moment Correlation
<sup>b</sup>Significance for the two-tailed at .05
<sup>c</sup>Descriptors based on Davis (1971) as ≥ .70 = very strong association; .50 - .89 = substantial association; .30 - .49 = moderate association; .10 - .29 = low association; .01 - .09 = negligible association

Stepwise multiple regression analysis was conducted with variables of gender, type of unit, employment status, primary shift scheduled to work, primary day of week scheduled and typical number of days per week scheduled were entered as independent variables, the overall
transactional distance mean score entered as the dependent variable and the probability of $F$
entered at .05. Two independent variables, “Primary Shift Scheduled-Days”, “Typical Days
Scheduled-Two” were retained in the equation and explained 18% of the overall variance
($R^2 = .184$) in the dependent variable over “Transactional Distance” as illustrated in the Model
Summary in Table 36.

Table 36
Regression Findings Predicting Transactional Distance for Frontline Registered Nurses Working
in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received
Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictors</th>
<th>$R$</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>$SEE$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Primary Shift Scheduled-Days</td>
<td>.429</td>
<td>.184</td>
<td>.167</td>
<td>.329</td>
</tr>
<tr>
<td></td>
<td>Typical Number of Days Scheduled-Two</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 37 illustrates the ANOVA results for the regression equation employing the two
independent variables “Primary Shift Scheduled-Days”, “Typical Days Scheduled-Two” in
predicting the overall transactional distances mean score.

Table 37
Analysis of Variance Illustrating Significance Two Independent Variables in Predicting
Transactional Distance for Frontline Registered Nurses Working in an Acute Care Facility that
Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from
their Nurse Manager

<table>
<thead>
<tr>
<th>Model</th>
<th>$df$</th>
<th>$SS$</th>
<th>$MS$</th>
<th>$F^a$</th>
<th>$p^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4</td>
<td>2.404</td>
<td>1.202</td>
<td>11.041</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Within Groups</td>
<td>98</td>
<td>10.670</td>
<td>.109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>13.074</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note Predictors: Primary Shift Scheduled-Days, Typical Number of Days Scheduled-Two

$a$ One Way Analysis of Variance

$b$ Significance for the two-tailed at .05
The coefficient values, t values and corresponding significant levels for the independent variables retained in the regression equation predicting overall transactional distance in frontline RNs working in an acute care facility that provides services 24 hours a day 7 days a week are presented in Table 38.

Table 38
Unstandardized Coefficient Values and Corresponding Standard Errors, Standardized Coefficients, T values and Corresponding Significant Levels for Independent Variables Retained in the Regression Equation Predicting Transactional Distance for Frontline Registered Nurses Working in an Acute Care Facility that Provides Services 24 Hours a Day 7 Days a Week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficient Values</th>
<th>Standardized Coefficient</th>
<th>T</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.792</td>
<td>42.989</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Primary Shift Scheduled-Days</td>
<td>.282</td>
<td>.347</td>
<td>3.752</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Typical Days Scheduled-Two</td>
<td>-.274</td>
<td>-.205</td>
<td>-2.215</td>
<td>.029</td>
</tr>
</tbody>
</table>

\(^a\) Significance for the two-tailed at \(0.05\)

The remaining independent variables that did not make a significant contribution to explain the variance in transactional distance were excluded from the regression analysis. No issues were found with collinearity based on variance inflation factor (VIF) for each variable < 10 and tolerance > .01 (Stevens, 1992). The variable “Primary Shift Scheduled-Nights” had the lowest tolerance (.361) and the highest variance inflation factor (VIF = 2.773). The excluded variables, standardized beta values, t values with significance levels measured at \(\alpha = .05\), partial correlations and tolerance levels for the regression equation to predict transactional distance are presented in Table 39.
Table 39
Excluded Variables, Standardized Beta Values, t Values with Significance Levels, Partial Correlations and Tolerance Levels for the Regression Equation Predicting Transactional Distance for Frontline RNs Working in an Acute Care Facility that Provides Services 24 hours a day 7 days a week that Received Educational Messages from their Nurse Manager

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta</th>
<th>t</th>
<th>p&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Partial Correlation</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Day of Week Scheduled-Weekday</td>
<td>.080</td>
<td>.836</td>
<td>.405</td>
<td>.085</td>
<td>.921</td>
<td>1.085</td>
</tr>
<tr>
<td>Primary Day of Week Scheduled-Weekend</td>
<td>-.092</td>
<td>-.942</td>
<td>.349</td>
<td>-.095</td>
<td>.865</td>
<td>1.156</td>
</tr>
<tr>
<td>Typical Days Scheduled-One</td>
<td>-.008</td>
<td>-.086</td>
<td>.931</td>
<td>-.009</td>
<td>.991</td>
<td>1.010</td>
</tr>
<tr>
<td>Typical Days Scheduled-Three</td>
<td>.037</td>
<td>.376</td>
<td>.708</td>
<td>.038</td>
<td>.851</td>
<td>1.176</td>
</tr>
<tr>
<td>Typical Days Scheduled-Four</td>
<td>-.067</td>
<td>-.728</td>
<td>.468</td>
<td>-.074</td>
<td>.986</td>
<td>1.014</td>
</tr>
<tr>
<td>Employment Status-Full-time</td>
<td>-.066</td>
<td>-.602</td>
<td>.549</td>
<td>-.061</td>
<td>.703</td>
<td>1.422</td>
</tr>
<tr>
<td>Age at Last Birthday</td>
<td>-.165</td>
<td>-1.804</td>
<td>.074</td>
<td>-.180</td>
<td>.976</td>
<td>1.024</td>
</tr>
<tr>
<td>Primary Shift Scheduled-Nights</td>
<td>.161</td>
<td>1.062</td>
<td>.291</td>
<td>.107</td>
<td>.361</td>
<td>2.773</td>
</tr>
<tr>
<td>Employment Status-Part-time</td>
<td>.041</td>
<td>.366</td>
<td>.715</td>
<td>.037</td>
<td>.663</td>
<td>1.509</td>
</tr>
<tr>
<td>Gender</td>
<td>-.071</td>
<td>-.774</td>
<td>.441</td>
<td>-.078</td>
<td>.983</td>
<td>1.017</td>
</tr>
<tr>
<td>RN Years of Experience</td>
<td>-.174</td>
<td>-1.911</td>
<td>.059</td>
<td>-.190</td>
<td>.983</td>
<td>1.017</td>
</tr>
</tbody>
</table>

<sup>a</sup>Significance for the two-tailed at .05
CHAPTER 5
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Purpose

The purpose of the research was to explore and determine the effect of disseminating educational messages from Nurse Managers to their frontline RNs working in an acute care hospital that provides services 24 hours a day 7 days a week on 1) transactional distance, 2) the transactional distance constructs of structure, dialogue and learner autonomy, and 3) overall RN satisfaction with the educational messages via email.

Research Objectives

1. To describe frontline RNs working in units of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following demographics:
   a. Age
   b. Gender
   c. Ethnicity
   d. Marital status
   e. Highest nursing degree obtained
   f. Years of experience as a RN
   g. Employment status (e.g. full-time, part-time, relief)
   h. Type of unit categorized: (e.g. intensive care, medical surgical)
   i. Primary shift scheduled to work
   j. Primary day of week scheduled
   k. Typical number of days per week scheduled
   l. Typical number of hours per day scheduled
2. To describe Nurse Managers working in an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following demographics:
   a. Age
   b. Gender
   c. Years of experience as a RN
   d. Years of experience as a Nurse Manager
   e. Current management span of control as measured by responsibility for the following:
      i. Number of patient care units
      ii. Number of campuses units located
      iii. Number of licensed patient care beds
      iv. Number of RN employees
      v. Number of full-time equivalents

3. To describe frontline RNs working in units of an acute care hospital located in the Southeastern region of the U.S. that provides services 24 hours a day 7 days a week on the following characteristics as measured by the *Multifactor Transactional Distance Survey*.
   a. Structure (as a construct of transactional distance)
   b. Dialogue (as a construct of transactional distance)
   c. Learner autonomy (as a construct of transactional distance)
   d. Transactional distance
   e. Learner experience

4. To examine the relationships between selected demographic characteristics of frontline RNs working in an acute care hospital located in the Southeastern region of the U.S. that provides
services 24 hours a day 7 days a week and transactional distance as measured by the

*Multifactor Transactional Distance Survey.*

a. Gender

b. Type of unit categorized: (e.g. intensive care, medical surgical)

c. Employment status (e.g. full-time, part-time, relief)

d. Primary shift scheduled to work

e. Primary day of week scheduled

f. Typical number of days per week scheduled

5. To determine if a model exists which would explain a significant portion of the variance of transactional distance as measured by the *Multifactor Transactional Distance Survey* from the subscales or latent factors and associated variables that emerge statistically following factor analysis of the dataset and selected demographic characteristics of age, years of experience as RN, employment status, primary shift to work, primary day of the week to work and typical number of days per week scheduled.

**Sample and Procedures**

The research setting was a two-campus, non-profit, academic, acute care hospital providing a full range of services 24 hours a day 7 days a week located in the Southeastern region of the U.S. The target population for this study was defined as frontline RNs working in acute care hospitals that provide services 24 hours a day 7 days a week. The accessible population was frontline RNs working in an acute care hospital that provides services 24 hours a day 7 days a week located in the Southeastern region of the U.S. Eligible RNs were employed at the beginning of the research project and worked in a variety of types of units, variety of unit sizes, were employed full-time, part-time or relief, were scheduled straight shifts, variable shifts, days, nights, or weekends, and various number of days or hours per week. RNs that were newly
employed after the beginning of the study period were not eligible to receive the survey even if they received the email educational messages for a portion of the study.

A census sampling procedure was used for the study. The frame for the accessible population was established by 1) obtaining a current list of employed frontline RNs from the human resource department of the acute care hospital participating in the study 2) verifying the accuracy of the RN list with the Nurse Manager 3) confirming that the RN was employed at the beginning of the research study and 4) verifying the RN continued to be employed prior to sending distributing the survey instrument.

Sixteen of the 21 Nurse Managers participated in the study. A contemporary threat to the study occurred when the nursing division underwent a major restructuring during the research project affecting the Nursing Manager’s assignments. The total accessible population was 422 frontline RNs that reported to the 16 Nurse Managers.

Over a three week-period, educational messages were developed by the researcher and emailed to the 16 participant Nurse Managers. They then forwarded the educational messages to frontline RNs via email.

Post educational message deliveries, data were collected using the *Multifactor Transactional Distance Survey*, a researcher-designed instrument. The survey consisted of 48 questions specifically designed to measure transactional distance constructs of structure, dialogue and learner autonomy. In addition, four questions measured overall satisfaction with the educational messages, and 17 questions for learner experience and demographic data were collected. During factor analysis procedures, six questions were found to be highly correlated (>0.7) and were removed from the data analysis.

The survey was administered via an on-line survey system (Zoomerang). A total of 422 surveys were emailed to frontline RNs. There were 103 total responses over a three-week period.
from January 23, 2010 until February 13, 2010. The survey was closed after three weeks
because even after reminder messages and incentives, the last week of the survey resulted in only
a few respondents. This resulted in a 24.4% response rate. A drawing for a $75 cash prize
response incentive at the end of week two was explained in the introductory letter and utilized.
A $25 cash prize response incentive was offered and utilized at the end of week three.

Summary of Findings

Objective One

Findings of Objective One indicated that the ages of frontline RNs ranged from a
minimum of 23 years of age to a maximum of 64 years of age with a mean of 40 years of age
\( n = 97, M = 30.6 \). The majority of the respondents were female \( n = 90, 92\% \), of the
Caucasian race \( n = 82, 84\% \), were married \( n = 68, 68\% \), had earned a Bachelor’s degree in
nursing \( n = 46, 47.4\% \). Years of experience as a RN ranged from six months to 42 years with
the most frequently reported years of experience being one year \( n = 13, 13.4\% \) followed closely
by two years \( n = 12, 12.4\% \) and 37.1% \( n = 36 \) with less than five years of experience.

The respondents were almost equally dispersed between working in a medical-surgical
unit \( n = 42, 43.3\% \) and a specialty unit \( n = 55, 56.7\% \). The majority of the respondents
reported that they work full-time \( n = 69, 71.1\% \), three days a week \( n = 54, 55.7\% \), for 12
hours a day \( n = 65, 67\% \) on the day shift \( n = 69, 71.1\% \), and rotate between working during
the week and the weekend \( n = 46, 47.4\% \).

Objective Two

The majority \( n = 15, 93.8\% \) of the participating Nurse Managers were female, reported
a mean age of 44 years with a range from 33 years of age to 55 years of age. The Nurse
Managers reported a mean of 17 years of experience as a RN and a mean of five years of
experience as a Nurse Manager. The majority \( n = 8, 50\% \) of the Nurse Managers are
responsible for a one patient care unit (30 or 31 beds) and six Nurse Managers (37.5%) are responsible for two patient care units. Two of the Nurse Managers were responsible for patient care units located on separate campuses. The majority of the Nurse Managers (n = 8, 50%) were responsible for 30 or 31 patient care beds with a range from a minimum of eight procedure rooms to a maximum of 60 licensed beds. The number of RNs that reported to participating Nurse Managers ranged from a minimum of 17 RNs to a maximum of 88 RNs. The minimum number of FTEs was 28 FTEs and a maximum of 97 FTEs. This included non-RN staff in addition to RN FTEs.

Objective Three

Factor analysis procedures were conducted on the 48 variables on the Multifactor Transactional Distance Survey. Visual inspection of the correlation matrix revealed six questions with a correlation of >.70 and thus removed from the factor analysis. Subsequent factor analysis using the remaining 42 variables resulted in a four-factor model that was responsible for explaining 55.13% of the variance in transactional distance.

Factor One, labeled “Dialogue”, consisted of nine variables with loadings ranging from .920 to .423. The item that received the highest level of dialogue from respondents was “Nurse Manager was available in person or by phone if needed” with a mean of 3.64 (SD = .672) which fell in the “regularly” range on the interpretive scale. The item that received the lowest level of dialogue was “I communicated with my Nurse Manager about the educational messages” with a mean of 2.43 (SD = 1.023).

Ten variables loaded on Factor Two with loading values ranging from .711 to .428. Factor Two was labeled “Structure”. “The educational messages were clearly presented” received the highest level of agreement with a mean of 3.18 (SD = .607) closely followed by the
item “The educational messages were available to me anytime” with a mean of 3.18 ($SD = .716$). All items ($n = 10$) fell in the “agree” range on the interpretive scale.

Factor Three contained six variables with loading values ranging from .938 to .654 and was labeled “Learner Autonomy”. The item that received the highest level of learner autonomy was “I would have participated in the educational series program to gain personal knowledge even if not pertinent to my work” with a mean of 3.09 ($SD = .597$) falling into the “agree” range on the interpretive scale. Overall, more items fell into the “disagree” range ($n = 4$) than the “agree” range ($n = 3$).

Six variables loaded on Factor Four with loading values ranging from .782 to .457 and was labeled “Learner Experience”. The item that received the highest level of learner experience was “I feel confident deleting email” with a mean of 3.88 ($SD = .361$). Overall, the items fell into the “very confident” range for using emails and the “agree” range for using other devices.

The majority of the respondents indicated they were “very satisfied” with the delivery of educational messages electronically ($M = 3.41, SD = .732$) and that the educational messages were applicable to nursing practice ($M = 3.34, SD = .657$). The respondents generally “agreed” that the educational messages provided a closeness between the frontline RN and the Nurse Manager ($M = 2.63, SD = .85$) as well as a closeness between the frontline RN and their co-workers ($M = 2.57, SD = 72$).

Most participants indicated they owned a cell phone ($n = 83, 81\%$) and a computer ($n = 70, 68\%$). They also use the cell phone ($n = 82, 80\%$) and the computer ($n = 71, 69\%$). Only 37 respondents (37\%) indicated they owned an iPhone. Respondents indicated they were overall “very satisfied” with the electronic delivery of educational messages ($M = 3.41, SD = .732$) and
used the Internet for professional and personal growth as well as pleasure. There were no respondents that indicated they never used the Internet.

**Objective Four**

The differences in overall transactional distance between the gender groups was not statistically significant ($F_{1,95} = .999, p = .753$). Additionally, no statistical differences were found between respondents working medical surgical units or specialty units ($F_{1,94} = .000$, $p = .992$) nor by employment status of full-time, part-time or relief ($F_{2,93} = 1.486, p = .232$). Analysis revealed no significant differences in the primary day of the week worked between weekdays, weekends or rotation ($F_{2,93} = 3.040, p = .053$).

Significant differences were found in respondents between groups that worked days, evenings and night shifts ($F_{3,92} = 4.602, p = .005$). Post hoc Tukey analysis demonstrated significant differences between the nurses that worked days ($M = 3.04, 95\% \text{ CI } [2.95, 3.17]$) and nurses that rotated shifts ($M = 2.44, 95\% \text{ CI } [-1.88, 6.75]$). However, Tukey post hoc analysis did warn the researcher that the group sizes were unequal. Comparisons between the other shifts indicated no statistically significant difference.

There were significant differences in the typical number of days scheduled ($F_{4,91} = 3.303, p = .021$). Tukey post hoc test revealed these differences to be between groups who are typically scheduled to work 5 days ($M = 3.03, 95\% \text{ CI } [2.79, 3.25]$) and those who are typically scheduled to work two days ($M = 2.59, 95\% \text{ CI } [2.25, 2.94]$). Comparisons between the other nurses who are typically scheduled to work any other number of days were not significant.

**Objective Five**

Findings for Objective Five are based on multiple regression analysis. The independent variables of age and RN years of experience were entered as interval variables while dummy coding was employed of the selected demographic independent variables of gender, type of unit,
employment status, primary shift scheduled to work, primary day of week scheduled and typical number of days per week scheduled. Sample size prohibited the use of sub-scales as the number of respondent per questions was approximately two. Thus, the overall mean scale score for transactional distance was used as the dependent variable.

Results demonstrated a model that explained a significant portion of the variance in transactional distance ($R^2 = .184$) from selected demographic variables ($F_{4,98} = 11.041$, $p < .001$). Two independent variables retained in the regression were found to significantly contribute to the regression model. The variables included “Primary Shift Scheduled-Days” and “Typical Number of Days Scheduled-Two”, explained 18% of the overall variance.

**Conclusions, Implications and Recommendations**

**Conclusion One**

The results of this study indicate that frontline RNs are ready to use email to receive educational messages based on their technical competency. This finding is based on frontline RNs that participated in the study reported that they felt “very confident” to use email with scores ranging from 3.47 to 3.88. The majority of frontline RNs reported owning a computer ($n = 71, 68\%$) leaving 32% of frontline RNs who do not own a personal computer. However, 100% of respondents reported using the Internet, indicating that they have access to a computer to obtain email. This is in contrast to the Pew Internet & American Life Project (2009) who reported that 74% of all adults use the Internet.

This is important for nursing leaders considering using email to disseminate educational messages as Chen (2001) found that learners with a higher technological skill level reported a lower transactional distance indicating less of a communication gap between the nurse and the Nurse Manager. In addition, Huang (2002) found that learner autonomy increased as computer skills improved. This would indicate that the nurse would be willing to participate in the
educational messages as a professional and as a self-directed learner. There were studies (Wilhelm et al., 2003) that found that students were frustrated with the technology and others (DeBourgh, 2003; Stein et al., 2005) that found that technical expertise did not have an effect on student satisfaction.

Based on the conclusion of this study, the researcher recommends to nursing leadership to immediately implement dissemination of information (educational messages and other messages) to frontline RNs through email. According to Hatala and Lutta (2009), intraorganizational facilitation of information sharing requires support from top management. The nursing leadership team will need executive support to implement the emailed message program. The frontline RNs have indicated that they have the competency to receive and to respond to email messages. Organizational leaders need to ensure that all frontline RNs have access to a computer to receive email. Thus, another recommendation is to allow frontline RNs to access to a hospital computer as needed to check email messages. Even though 100% of the nurses indicated using Internet, this would ensure the 32% that do not own a personal computer had access to the email messages.

Once the email messages program is begun, it is important to hold the frontline RN accountable for reading the email message. Thus, it is also recommended by this researcher to set the expectation that the frontline RN checks email daily or prior to the start of the shift. This would ensure that if Nurse Managers use email to disseminate critical information on policy changes, the frontline RN would receive this information prior to initiation of patient care. It is also recommended that a tracking system be established to monitor the checking of emails by the frontline RN staff, that the Nurse Manager check this periodically and hold the frontline RN accountable to check the messages.
Conclusion Two

Frontline RNs are not only technically ready to participate in communication via email, the results of this study revealed that frontline RN respondents demonstrated overall satisfaction with the delivery of educational messages electronically ($M = 3.41, SD = .732$). They indicated that the educational messages delivered electronically were available to them at anytime ($M = 3.02, SD = .586$) indicating a flexibility in being able to read or study them anywhere at any time.

Results also revealed that the emailed educational messages met the needs of frontline RNs ($M = 2.84, SD .651$). The frontline RNs also indicated a level of learner autonomy from the reported “I would have participated in the educational series even if I had not been pressured from work” ($M = 3.06, SD = .592$). This supports their professional responsibility to the patients and public to maintain their competencies (Nursing: Scope and Standards of Practice, 2004).

This was similar to studies by DeBourgh (2003), Northup (2002), Trickler (2001) and Rice and Shook (1990) who found that flexibility in being able to work when and where they wanted to as an important factor in choosing on-line courses over the traditional classroom. Young (2006) also found that email was convenient for students and that an important factor in effective on-line courses was that it had to meet the needs of students. Lightfoot (2006) found that an advantage of email was the flexibility of the interaction between the teacher and the student anytime anywhere.

This conclusion has an important implication for organizational leaders. The labor cost of conducting a FtF staff meeting includes not only the Nurse Managers’ time, but the frontline RN’s salary if they came on their day off and the time away from the bedside if they attend during work. Frontline RNs indicate they liked the flexibility of receiving educational messages by email. The recommendation to the nursing leadership team by the researcher is that traditional staff meeting agendas be revised to include only communication that requires rich
media and identify selected lean communication that would be appropriate to consider using email communication. A pre-post labor cost analysis and frontline RN satisfaction surveys should follow to evaluate the outcomes.

Nursing leaders meet monthly or bi-monthly for many hours. Much of the lean information could be delivered via email. It is recommended by this researcher that the nursing leadership meeting agendas be reviewed and revised to include items that need discussion and/or decision, or rich media. It is recommended that lean media items be delivered to nursing leaders via email followed by discussion at the nursing leadership meeting on an as needed basis. This should decrease time nursing leaders spend in meetings, leaving more time to spend on the units.

Conclusion Three

The results of this study support the theory that nurses are dispersed employees; thus making transactional distance theory an important body of knowledge for nursing research. This conclusion is based on the study finding that frontline RNs who responded primarily work full-time \( n = 69, 71.1\% \), three days a week \( n = 54, 55.7\% \), 12 hours a day \( n = 65, 67\% \) and rotate between weekdays and weekends \( n = 46, 47.4\% \).

This is further supported by the ANOVA analyses. A significant difference was found between nurses who are typically scheduled to work two days a week \( M = 2.59, 95\% \ CI [2.25, 2.94] \) than those who are typically scheduled to work five days a week \( M = 3.03, 95\% \ CI [2.79, 3.25] \). Nurses that were typically scheduled to work two days a week had a lower mean transactional distance scale score than those typically scheduled to work five days a week. In addition, ANOVA also found a significant difference between nurses who are typically scheduled to work the day shift \( M = 3.04, 95\% \ CI [2.95, 3.17] \) and those that rotated shifts \( M = 2.44 \ 95\% \ CI [-1.88, 6.75] \). Nurses that are typically scheduled to work days have a higher
transactional distance scale score than those that rotate. It should be noted that the group sizes were unequal.

This is similar to studies by Kalisch et al. (2008), McGettrick (2006) and Richardson et al. (2003) who also found that most RNs work 12-hour shifts. In addition, Kalisch et al. pointed out that although these RNs work full-time, it feels like hospitals have all part-time nurses because they only work three days a week. Rosenfield et al. (2004) reported that as organizations become more complex, the adequacy of communication declines.

This conclusion has important implications to nursing leaders and hospital executives. Most full time frontline RNs only work three days a week. Sometimes these three days fall on a weekend. As hospital leaders plan activities that require dissemination of information that is time sensitive to frontline RNs, they need to realize that frontline RNs are dispersed employees. The researcher recommends to the hospital leaders to identify alternative strategies, to include email, to disseminate selected information to frontline dispersed RNs.

**Conclusion Four**

Nurse Managers’ span of control that participated in this study varied. The Nurse Managers’ direct report FTEs ranged from 28 to 97 FTEs, licensed beds / procedural areas were as high as 60 licensed beds and a couple of Nurse Managers covered two campuses. This corroborated the study by Shirey et al. (2008) who found that the Nurse Manager’s span of control was very, large ranging from 60 to 160 employees. It is very difficult for Nurse Managers to communicate FtF with a large span of control, and strategies such as email would facilitate dissemination of important educational messages in a timely manner.

Based on this conclusion, the researcher recommends that Nurse Managers work collaboratively with the Human Resources department to obtain and provide to Nurse Managers email addresses for all frontline RNs. Another recommendation is to obtain email addresses for
frontline RNs upon hire with the expectation set that messages would be sent by email. A process should be established to automatically discontinue the email address upon termination. In addition, the Clinical Education Department needs to include in Nurse Manager Orientation a lesson on how to set up and maintain email addresses.

Conclusion

Five Frontline RNs that participated felt that the Nurse Managers responded to the emails in a timely manner ($M = 3.34, SD = 1.019$) and that their Nurse Manager was available to them in person or by phone if needed ($M = 3.64, SD = .672$).

This is an important implication for the Nurse Managers if email communication is implemented; because other studies by Dennen et al. (2007), Granberry (2007) and Ortiz-Rodriguez et al. (2005) found that timely and individualized feedback was the most essential factor for communication in distance education classes. Employees value communication from within their own occupation or group (Cho & Lee 2008; Grice et al. 2006). Thus, frontline RNs value the communication directly from their Nurse Manager.

Based on this conclusion, the researcher congratulates the Nurse Manager for their perceived timely response to emails and availability to their staff. Interestingly, although there was very little communication between the frontline RN and the Nurse Manager about the educational messages ($M = 2.43, SD = 1.023$), frontline RNs felt their Nurse Manager was available in person or by telephone if needed ($M = 3.64, SD = .672$). Young (2006) found that instructors had to work hard to manage the volume of emails. The researcher recommends that Nurse Managers that currently use and those that implement email communication to frontline RNs ensure timely and individualized feedback is consistently done. The researcher also recommends that a policy is implemented that Nurse Managers respond to emails at least daily to
ensure that frontline RNs that use email communication receive timely and individualized feedback.

**Conclusion Six**

There were no significant differences in learner autonomy-technical expertise between the age groups. This is good news for nursing leaders who may have the perception that the older workforce would have problems adapting to the newer technology and receiving educational messages by email. This further substantiates the researcher’s recommendation to implement email communication strategies to deliver lean communication to the frontline RN staff.

There was a statistically significant low negative correlation, as defined by Davis (1971) descriptors, between age and overall transactional distance \((r = -.225, p = .012)\). This could indicate that the older nurse with more experience is more autonomous and does need to feel the closeness to the Nurse Manager that the younger, less experienced nurse does.

**Conclusion Seven**

The researcher-developed instrument *Multifactor Transactional Distance Survey* items identified as variables of transactional distance had an internal consistency at a Cronbach’s Alpha of .929. This was subsequent to removal of six questions after visualization of the correlation matrix revealed correlations > .70 for these questions. The factor analysis resulted in four factors that were determined to best represent transactional distance constructs. They were Factor 1 Dialogue \((r = .916)\), Factor 2 Structure \((r = .919)\), Factor 3 Autonomy \((r = .905)\) and Factor 4 Learner Experience \((r = .83)\).

The factors support Moore’s (1972) Theory of Transactional Distance consisting of constructs of structure, dialogue and autonomy. A number of studies researched one or two of the transactional distance constructs, but few have attempted to study all the constructs of the
theory. In addition, most studies based on transactional distance theory are based in academia and very few in organizational learning. Thus, this research has contributed to the transactional distance body of knowledge. The researcher recommends that further research is considered that would strengthen the instrument and transactional distance theory in the organizational setting.

**Recommendations for Further Research**

Future research needs to be conducted to investigate the knowledge obtained by the frontline RNs who receive emailed educational messages compared to the traditional classroom or traditional staff meeting. In addition, is the information received electronically transferred into practice that leads to improved patient care outcomes?

Further research should be conducted to evaluate the satisfaction by Nurse Managers who disseminate critical information to frontline RNs. Because frontline RNs are dispersed and Nurse Managers have large spans of control, Nurse Managers indicated frustration that they only get to see their frontline RNs 25-30% of the time (Whitaker, 2008). Thus, strategies that impact Nurse Manager satisfaction are important to organizational leaders.

It would be beneficial the body of nursing research and the socialization of student nurses into the professional practice to further study the correlation between the novice nurse and transactional distance constructs. This study found younger nurses to be technically competent, but had a lower transactional distance or distanced from their Nurse Manager.

A replication study would be beneficial after the educational messages have been disseminated by email over a longer period of time. This study evaluated the effect of disseminating the email messages after a three-week period. This may not have been long enough for frontline RNs to evaluate the full effect of the electronic dissemination method.
Other important research to consider is to evaluate other computer mediated communication strategies such as instant messaging and social media (Facebook, Twitter, Blogs) to disseminate information to frontline RNs and the impact on transactional distance.

The researcher was unable to locate in the literature a survey instrument that measured overall transactional distance. There were many researcher-developed surveys that measured one or two constructs of structure, dialogue or learner autonomy, but no fully comprehensive instrument. Thus, the researcher recommends that the Multifactor Transactional Distance Survey be further studied and refined as a useful instrument to measure transactional distance for both educators and organizational leaders. The research suggests further development of the theory of transactional distance in order to measure this latent construct with more accuracy.
REFERENCES


92


APPENDIX A

HOSPITAL IRB APPROVAL

Baton Rouge General
A Community of Caring

Institutional Review Board

TO: Wanda Hughes, RN
FROM: Michelle Brignac, IRB Coordinator
RE: 2009-RP018 - Transactional Distance Theory: The Effect of Disseminating Educational Messages to Dispersed Frontline Nurses Using Computer Mediated Communications
DATE: November 12, 2009
CONTINUING REVIEW DATE: September 30, 2009

IRB APPROVAL DOCUMENT

On behalf of Baton Rouge General Medical Center Institutional Review Board, Richard Burroughs, MD, IRB Chairman has received and reviewed the Initial Application, Research Proposal, Waiver of Consent and Conflict of Interest Form for 2009-RP018 - Transactional Distance Theory: The Effect of Disseminating Educational Messages to Dispersed Frontline Nurses Using Computer Mediated Communications for expedited review.

Dr. Burroughs has determined that this study does meet the requirements for expedited review. The study involves no more than minimal risk and the only involvement of human subjects falls in the following category:

Research on individual or group characteristics or behavior (including, but not limited to, research on perception, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Approval was granted on November 5, 2009 for eleven months. You are granted permission to conduct your study as described in your application effective immediately. The IRB will be notified of this approved expedited review at the December 8, 2009 meeting.

The study is subject to continuing review on or before September 30, 2009. We recommend that it be presented one month prior to this date to avoid a delay in enrollment in the case of unforeseen circumstances.

Note:
1. The IRB complies with the requirements found in Part 56 of the Code of Federal Regulations and Part 46 of Federal Regulations
2. Re-Review of this proposal is necessary if:
   1. Any significant alterations or additions are made to the protocol/proposal.
   2. You wish to continue beyond the continuing review date assigned to the study.

BRGMC FWA #: 00001821
## APPENDIX B

### INFORMATION TO NURSE MANAGERS

Disseminating Education Messages to Frontline Registered Nurses Using Computer Mediated Communication (E-mail)

| Principle Investigator(PI) | • Wanda Hughes RN MSN Ph(c)  
|                           | Doctoral Candidate – Principle Investigator  
|                           | • Krisanna Machtmes, PhD  
|                           | Major Professor – Dissertation Chair |

### Rationale for Research Study

- Nurses that work in acute care hospitals that provide services 24 hours a day 7 days a week with a variety of schedules can be considered dispersed or distanced employees from their Nurse Manager
- It is a huge challenge for nurse managers to disseminate information to this distanced staff in a timely manner with everyone getting the same message
- Nurses value communication from their direct supervisor
- Nurses value continuing education

### Purpose for Research Study

- To determine the effect of disseminating educational messages from Nurse Managers to frontline RNs working in an acute care hospital that provides services 24 hours a day 7 days a week

### Participants

- Frontline RNs that provide direct patient care.
- Includes RNs that work full-time, part-time, relief
- Includes RNs that work weekdays and/or weekends
- Includes RNs that work straight shifts or rotating shifts
- Excludes RNs that do not provide direct patient care (e.g. educators, care mgt.)
- Nurse Managers working in a acute care hospital that provides services 24 hours a day 7 days a week that supervise RNs that provide direct patient care

### Study Procedure

- At least once a week for 3 weeks, the PI will develop educational messages
- Educational messages based on regulations, policies or evidence based practices; be short taking no more than 15 minutes to read
- The PI will disseminate the educational messages to Nurse Managers via email
- Nurse Managers will disseminate the educational message to frontline RN staff via email only (See attached: specific instructions to Nurse Managers for emailing, attaching, receiving, and responding to the emailed educational messages).
- After the 3rd week, the frontline RNs will be asked to complete a voluntary survey

### Benefits

- The study may identify a strategy that would improve the flow of information to frontline RNs and impact organizational learning; contribute to nursing leadership’s responsibility for ensuring ongoing staff competency; and contribute to the individual RNs responsibility as a professional to maintain ongoing competency and education

### Risks

- There should be no risks to the participants
- Email addresses will protected from co-workers by using the “blind copy” function
- Responses to email messages will be tracked by the Nurse Manager and will be anonymous to the researcher.
- Survey responses will kept confidential to the researcher in a locked file cabinet
- Frontline RNs who complete the survey will be assured that there will no consequences to employment based on information obtained during the study

### Right to Refuse

- Participants may choose not to participate as completion of the survey is voluntary

### Anticipated Timeline for Study

- Week of December 7th: Informational meetings with Nurse Managers
- Week of December 7th: Informational letter sent; 1st email message sent
- Week of December 14th: Second educational message
- Week of December 21st: Third educational message
- Week of December 28th: Survey sent to Frontline RNs
APPENDIX C

EMAIL INSTRUCTIONS

Step 1: Receive educational message

Step 2: Click forward

Step 3: Erase all of these lines “From, Send, To, Subject”

Step 4: Erase

Step 5: Type in RN list serve as blind copy

As you are aware, BRG is now in its final countdown for its triennial Joint Commission survey. I am attaching the Agenda provided to us by TJC. Please note that data collection begins on Tuesday, November 7 at 7:30am, and all information gathered by the end of the survey process on November 12 at 8:00am will be used in our next evaluation. The surveyors will remain on-site until November 12 at 5:00pm and will be available to answer questions and provide feedback on the survey process.

It is essential that all members of the organization be aware of the survey and its purpose. The survey is designed to evaluate the organization’s performance in providing high-quality care to patients. The surveyors will be evaluating the following areas:

1. **Patient Safety**
   - **Emergency Department**: Assessing the preparedness of the emergency department to handle emergencies efficiently and effectively.
   - **Inpatient Units**: Evaluating the adequacy of the inpatient units to meet the needs of patients.

2. **Quality of Care and Outcomes**
   - **Surgical Services**: Evaluating the performance of surgical services in terms of patient outcomes.
   - **Pharmacy Services**: Assessing the effectiveness of pharmacy services in meeting patient needs and ensuring medication safety.

Please review the Agenda attached and ensure that all areas are covered during the survey process. Any questions or concerns should be addressed immediately.

Thank you for your cooperation and dedication to providing the highest level of care to our patients.
APPENDIX C (CONTINUED)

This will be the end result of what your Frontline Staff will see. The Nurse Manager name will be in the “From” box. The email addresses of staff will be confidential. The email message will be from the “Nurse Manager – You.”

STEP 6:
- CLICK “OPTIONS”
- CLICK “REQUEST READ RECEIPT”
Because you have put a “Read Receipt” you will know if & when your staff has read the message.

Then, Transfer over to your Email Response Log that the Message was “Read”. If the staff responds 4 times, make 4 check marks (√)

The log will be returned to PI at the end of the study
APPENDIX D

EMAIL RESPONSE LOG

Instructions:
- List each RN on your unit under name
- Put either “R” or “Read” once the nurse has “read receipted” your message
- Put a ✓ (check mark) for any responses to the educational message (could be written or verbal)

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UNIT:
APPENDIX E

INVITATION LETTER TO PARTICIPANTS TO PARTICIPATE

To: Frontline Registered Nurse - Participant

Providing patient care in the acute care hospital setting is a complex endeavor that is highly dependent on accurate and up-to-date information. As a registered nurse, you have a professional duty and responsibility to maintain professional competency. In addition, an important role for Nurse Managers is to create a learning environment and provide information for nurses to perform their duties. Thus, rapid dissemination of information is important for both you as a frontline nurse as well as the Nurse Manager.

Nurses that work in acute care hospitals that provide services twenty-four hours a day, seven days a week present an additional challenge to Nurse Managers to disseminate information in a timely and efficient way. In today’s environment, nurses work a variety of schedules. Some full-time nurses work three 12-hour shifts a week – meaning that they are available Face-to-Face three days a week for the Nurse Manager to disseminate important messages. Thus, many nurses could be called a “dispersed employee” or distanced from the Nurse Manager.

One strategy to disseminate information to dispersed staff is to send information by email. I am requesting that you participate in a research study using email to receive educational messages from your Nurse Manager. The messages will be short taking no more than 15 minutes to read. Then in a few weeks you will be asked to complete a short survey to evaluate the effectiveness of using email to disseminate information. This study has been approved by the Institutional Review Board at Baton Rouge General and Louisiana State University.

To participate, you will need to provide your email address to your Nurse Manager. If you need assistance in setting up a free email address, feel free to contact me. Your email address will be known by your Nurse Manager and me as Principle Investigator. Your email address will not be shared with your co-workers. You may respond to your Nurse Manager about the email message. You may do this by using email or verbally by telephone or in person.

Your participation is voluntary. Your job will not be affected if you decide not to participate. If you have any questions, you may contact me at any time.
Thank you in advance for your participation!

Wanda Hughes, Principle Investigator
Administrative Director of Nursing, BRGMC
225-387-7779; email: wanda.hughes@brgeneral.org
APPENDIX F

EDUCATIONAL MESSAGE # 1 – WHY JOINT COMMISSION?

Why Joint Commission?
The Mission of “The Joint Commission” (TJC for short) is to continuously improve health care for the public, in collaboration with other stakeholders, by evaluating health care organizations and inspiring them to excel in providing safe and effective care of the highest quality and value.

Where did Joint Commission come from?
In 1918: The American College of Surgeons adopted **FIVE OFFICIAL STANDARDS** for the delivery of care in hospitals that would be considered the “Minimum Standard of Care”.

- Physicians with hospital privileges need to be organized as a group.
- Staff physicians and surgeons hold full medical staff degrees and medical licenses and be worthy in character and professional ethics.
- Medical staffs need to hold meetings at least once a month and that the staff reviews all clinical records for analysis of clinical services.
- Staff complete accurate case records for all patients, and.
- Diagnostic and therapeutic facilities need to be available for diagnosing and treating patients, including pathology, radiology and laboratory services.
- The 1st on-site survey inspection was conducted by physicians only. Sixty-nine of 692 hospitals met “The Minimum Standard”

What are the Joint Commission standards?
The standards are divided into the “chapters” below and each has numerous requirements.

- **Environment of Care**: Goal to promote a safe, functional and supportive environment so quality and safety are preserved. Consists of 1) The building, 2) The equipment and 3) The people
- **Emergency Management**: These standards provide guidelines for hospitals to plan for unanticipated emergencies (such as hurricanes, fire). The phases are: 1) Mitigation, 2) Preparation, 3) Response and 4) Recovery.
- **Human Resources**: These standards address the hospitals’ responsibility to establish and verify staff qualifications, orientation of staff, and provide staff with the training they need to provide or support patient care.
- **Infection Prevention and Control**: These standards are designed to assist the hospital develop activities of planning, implementation and evaluation of an infection control program.
- **Information Management**: Provide guidelines to systematically manage information – both paper and electronic. Planning provides for continuity of information captured, use and storage.
- **Leadership**: Provides standards for 1) a culture of safety as a priority, 2) planning that meets the needs of patients, 3) availability of human, financial and physical resources, 4) existence of competent staff and 5) ongoing evaluation and improvement in performance.
- **Life Safety**: Provides standards to prevent and manage a fire in the hospital
APPENDIX F (CONTINUED)

- **Medication Management**: Provides standards for a safe medication management system. Includes 1) planning, 2) selection & procurement, 3) storage, 4) ordering, 5) preparing & dispensing, 6) administration, 7) monitoring and 8) evaluation.

- **Medical Staff**: These standards provide structure for the organized medical staff, privileging and credentialing, and ongoing competency of physicians.

- **National Patient Safety Goals**: These are derived from actual events that have caused harm.
  1. Improve accuracy of patient identification
  2. Improve effectiveness of communication among caregivers
  3. Improve the safety of using medications
  4. Reduce the likelihood of patient harm associated with the use of anticoagulant therapy
  5. Reduce the risk of health-care associated infections
  6. Accurately and completely reconcile medications across the continuum of care
  7. The hospital identifies safety risks inherent in its population – risk for suicide
  8. Prevention of wrong site, wrong procedure, wrong person surgery

- **Nursing**: Outlines requirements of the Nurse Executive and Nursing Care Standards

- **Provision of Patient Care**: Composed of 4 core components: 1) Assessing the patient’s needs, 2) Planning care, treatment, and services to include Plan of Care 3) Interventions to provide care, treatment and services to include Patient Education and 4) coordinating care, treatment, and services to include Transfers and Discharges.

- **Performance Improvement**: Stresses the importance of using data to make decisions and improve care. Includes: Collection, analyzing and improving.

- **Record of Care**: Outlines requirements for documenting patient care

- **Rights and Responsibilities of the Patient**: Recognizes the rights of patients; empowers them to ask questions and be part of their care planning.

- **Transplant Safety**: Requirements for Organ Donation

- **Waived Testing**: Outlines requirements for Point of Care Testing such as Accuchek.

- **Sentinel Events**: This is an event that is an unexpected occurrence of an event involving death or serious physical (loss of limb or function) or psychological injury or the risk thereof.
  - Suicide of any inpatient or within 72 hours of discharge
  - Unanticipated death of a full term infant
  - Abduction of any patient receiving care
  - Discharge of an infant to the wrong family
  - Rape, confirmed
  - Hemolytic transfusion reaction involving administration of blood or blood products
  - Surgery on the wrong patient or wrong body part
  - Unintended retention of a foreign object in a patient after surgery or other procedure
  - Severe neonatal hyperbilirubinemia (bilirubin > 30 milligrams/deciliter)
  - Prolonged fluoroscopy with cumulative > 1500 rads to a single field or any delivery of radiotherapy to the wrong body region or > 25% above the planned radiotherapy dose
How does a hospital prepare for a Joint Commission survey?

- The standards provide a Framework for quality patient care delivery. The standards continually change as evidence is available that provides a better way to deliver care. In response, hospitals continually:
  - Check for new or revised standards
  - Develop improved processes and policies to meet the evidence
  - Educate the staff on the new evidence
  - Practice, practice and more practice - like the Saints 😊

Enjoy watching the way one hospital kept their staff informed

- Either go to You Tube Joint Commission Linebacker OR
- Copy and paste the link below into your Internet Browser:
  [http://www.google.com/search?hl=en&source=hp&q=youtube+joint+commission+linebacker&aq=0sx&oq=Youtubejoint&aqi=g-sx3](http://www.google.com/search?hl=en&source=hp&q=youtube+joint+commission+linebacker&aq=0sx&oq=Youtubejoint&aqi=g-sx3)
APPENDIX G

EDUCATIONAL MESSAGE # 2 – INFECTION CONTROL

INFECTIONS - HEALTH CARE ASSOCIATED INFECTION

What is HAI?
- HAI stands for Healthcare Associated Infection
- It is commonly referred to as “nosocomial” or “facility-acquired”
- An infection occurring after 72 hours after admit
- According to the CDC, HAI is one of the top 10 leading causes of death in the US
- Common HAIs & reference at http://www.cdc.gov/ncidod/dhqp/id.html

Enjoy a little humor: Germ “walks into a bar”

The Best “Cure” is Prevention which can be done through “Precautions”!!

1. STANDARD PRECAUTIONS (previously called Universal Precautions):
   - Assumes that all blood, body fluid, secretions, excretions may contain germs
   - These prevention practices apply to all patients regardless of infectious status
   - Precautions include:
     - Hand hygiene
     - Gloves, gown, mask, eye protection on anticipated exposure
     - NEW: Safe injection practices
     - NEW: Respiratory Hygiene/Cough Etiquette (visitor - high traffic areas)
     - NEW: Use of masks for insertion of catheters during spinal/epidural

   The basics - http://www.youtube.com/watch?v=JHRu8eSUHU8

2. TRANSMISSION-BASED PRECAUTIONS (a.k.a. Isolation Precautions):
   - Based on the means of transmission
   - Types: Airborne, Droplet, Contact (hand-hygiene), Contact (hand-washing)

   AIRBORNE
   - Infectious agent can remain suspended in the air for prolonged periods of time and can be carried on normal air currents in a room or beyond to adjacent spaces or areas receiving exhaust air.
   - Examples include: TB, measles, chicken pox, HIV, SARS
   - Precautions include:
     - Standard precautions
     - Negative pressure room
     - N95 particulate respirator or hepa-filter mask
     - Place BLUE sign on door

   DROPLET
   - Infectious agent is spread through close respiratory or membrane contact
   - Does not stay infectious over long distances
   - Examples include: SARS, Flu, Meningitis, Strep, Mumps
APPENDIX G (CONTINUED)

- Precautions include:
  - Standard precautions
  - Mask (caregiver and family) within 3 feet
  - Place **GREEN** sign on door

**CONTACT (hand-hygiene)**
- Infectious agent is spread by direct or indirect contact
- Examples include: MRSA, E-coli, Shigella, Hepatitis, Lice, Herpes
- Precautions include:
  - Standard precautions
  - Hand-hygiene
  - Gloves
  - Long sleeve gowns
  - Disposable supplies
  - Place **PURPLE** sign on door

**CONTACT (hand-washing)**
- Infectious agent is spread by direct or indirect contact
- Example is: Clostridium Difficile - commonly called “c-diff”
- Precautions include:
  - Standard precautions
  - Hand-washing
  - Long sleeve gowns
  - Disposable supplies
  - Place **ORANGE** sign on door

Germs never sleep: [http://www.youtube.com/watch?v=pRJTeHeRGC0&NR=1](http://www.youtube.com/watch?v=pRJTeHeRGC0&NR=1)
APPENDIX H

EDUCATIONAL MESSAGE # 3 – FIRE SAFETY

LIFE SAFETY – Tips for Success

A serious fire can be one of the most devastating emergencies a hospital can face. Most of us think the chances of a FIRE in a hospital are so slim that we take FIRE PREVENTION for granted until it is too late!

CONSIDER THESE HEADLINES

MOSCOW: At least 42 people were killed when a fire broke out at a hospital here on early Saturday. The fire is said to have started on the second floor of the eight-storey Drug Treatment Hospital at 1.40 a.m. Moscow time. "A total of 214 people were rushed to safety out of the burning building," Emergency Ministry spokesperson Irina Andrianova was quoted as saying. A suspicious fire combined with a blocked exit turned the women's ward of a Moscow drug treatment hospital into a deathtrap Saturday as flames and smoke overcame patients. At least 45 women trapped behind a locked gate were killed in the deadliest fire in the Russian capital in decades.

MOUNTAIN VIEW: The smoky fire that forced the evacuation of three floors at El Camino Hospital last week began in a supply cabinet on the fourth floor, although its cause is still uncertain, Mountain View Fire Department spokesperson Lynn Brown said Monday. The Feb. 22 blaze caused $40,000 in fire, water and smoke damage to equipment, according to hospital spokesperson Judy Twitchell. Patients in the fourth, fifth and sixth floors on the west side of El Camino's bed tower were evacuated to protect them from the fire's smoke. Fourth-floor patients, who had recently undergone heart procedures and needed constant monitoring, were moved to the second floor and the emergency departments, where there was extra room. Half of these patients have returned to the fourth floor. Fifth-floor patients, who were recovering from surgeries, and sixth-floor patients, who had medical ailments, went back to their original rooms later on the day of the fire.

Most FIRES produce an immense amount of smoke that is highly toxic. For this reason, smoke is responsible for more fire fatalities than flames. A smoky fire can have the following effects on humans:

- Within 30 seconds – Disorientation
- Within 2 minutes – Unconsciousness
Within 3 minutes – Death
Timing is critical during a fire. To ensure your safety, you must know how to respond to any fire emergency.

What is the “Life Safety Code?” LSC is a set of fire protection requirements designed to provide a reasonable degree of safety from fire. It covers construction, protection, and operational features designed to provide safety from fire, smoke, and panic. The LSC, which is revised periodically, is a publication of National Fire Protection Agency, which was founded in 1896 to promote the science and improve the methods of fire protection.

There are 4 components of the Life Safety Code: All are applicable to nurses:

- **Fire Load** - All materials which might contribute to the fuel aspect of a fire within the building and requirements pertaining to construction, interior finish, draperies, furnishings, and building service equipment.
  
  Examples applicable to nursing:
  - Unsecured Oxygen Tanks
  - Christmas Tree Decorations unapproved
  - Overloaded electrical circuits – check under desks
  - Supplies in storage closets is 18” below smoke detector
  - Biomed inspection of all equipment & appliances prior to use

- **Fire Containment** - Those elements which tend to restrict the spread of flame, smoke, or fire gases throughout the building, such as corridor wall construction, subdivision of floor areas, and protection for vertical openings.
  
  Examples applicable to nursing:
  - A fire door serves as a barrier to limit the spread of fire & restrict the movement of smoke. Fire doors are normally rated between 20 minutes & 3 hours – which indicates how long the door assembly can withstand heat & a water hose stream. Fire doors must always remain closed & unobstructed. They should never be propped open.

- **Fire Extinguishment** - Elements which help to put out the fire as quickly as possible. They include alarm systems, portable extinguishers, sprinkler systems, and special requirements for protection of hazardous areas.
  
  Examples applicable to nursing:
  - Fire extinguishers are blocked by equipment
APPENDIX H (CONTINUED)

- **Evacuation**: Those elements which facilitate the removal of occupants from the scene of the fire. They include details of the emergency plan and exiting capability from the building.

- **Examples applicable to nursing**:
  - Hallways and egress routes must be free of clutter
  - Cluttered corridors – with carts, chairs, equipment (must be all on one side).
  - According to Joint Commission, “if the hallway looks cluttered, it probably is”…
  - Per Joint Commission: Computer carts may not be parked in corridors unless
    - they are “in use” by staff. The definition of “in use” is that the cart is being actively accessed at least once every 30 minutes.
    - Crash carts are considered to be “in use” at all times.
    - Infection control carts can remain in the hall as long as they are outside an active
    - Isolation patient’s room

What to expect from Joint Commission [http://www.youtube.com/watch?v=ZGVA-BHNncI&NR=1](http://www.youtube.com/watch?v=ZGVA-BHNncI&NR=1)

What to expect from Joint Commission [http://www.youtube.com/watch?v=MDTpVUJTtss](http://www.youtube.com/watch?v=MDTpVUJTtss)
APPENDIX I
MULTIFACTOR TRANSACTIONAL DISTANCE SURVEY

Educational Messages Survey

Over the last few weeks, you have been presented with Educational Messages. Please answer the following questions that will assist in evaluation of the messages as well as help us prepare for the future. Thank you.

1. The educational messages were clearly presented.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

2. The educational messages met my needs.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

3. The educational messages contained graphics relevant to the material.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

4. The educational messages were available to me anytime.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
5. The educational messages were easily applied.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

6. The educational messages contained examples to support the content.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

7. The educational messages included rationale or evidence to support change.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

8. The educational messages contained clear expectations from my nurse manager.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

9. The educational messages contained directions for documentation.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
APPENDIX I (CONTINUED)

10. The educational messages indicated an effective start date when applicable.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

11. The educational messages indicated who to contact if I had questions.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

12. The educational messages provided additional references.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

13. The educational messages included frequently asked questions or equivalent.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

14. Feedback to nurse manager was encouraged.
   - Never
   - Rarely
   - Occasionally
   - Regularly
15. I communicated with my nurse manager about the educational messages.
   - Never
   - Rarely
   - Occasionally
   - Regularly

16. There was personal, meaningful dialogue with nurse manager.
   - Never
   - Rarely
   - Occasionally
   - Regularly

17. Feedback from nurse manager was timely.
   - Never
   - Rarely
   - Occasionally
   - Regularly

18. Emails were responded to timely by nurse manager.
   - Never
   - Rarely
   - Occasionally
   - Regularly

19. Nurse manager was available in person or by phone if needed.
   - Never
   - Rarely
   - Occasionally
   - Regularly
20. Feedback to my co-workers was encouraged.

- Never
- Rarely
- Occasionally
- Regularly

21. I communicated with my co-workers about the educational messages.

- Never
- Rarely
- Occasionally
- Regularly

22. The educational messages provided a closeness between me and my nurse manager.

- Never
- Rarely
- Occasionally
- Regularly

23. The educational messages provided a closeness between me and my co-workers.

- Never
- Rarely
- Occasionally
- Regularly

24. Satisfaction with knowledge gained from the education messages.

- Not at all Satisfied
- Not Very Satisfied
- Somewhat Satisfied
- Very Satisfied
APPENDIX I (CONTINUED)

25. **Satisfaction with learning gained from discussions with co-workers.**
- Not at all Satisfied
- Not Very Satisfied
- Somewhat Satisfied
- Very Satisfied

26. **Satisfaction with applicability of educational messages to nursing practice.**
- Not at all Satisfied
- Not Very Satisfied
- Somewhat Satisfied
- Very Satisfied

27. **Satisfaction with delivery of educational messages electronically.**
- Not at all Satisfied
- Not Very Satisfied
- Somewhat Satisfied
- Very Satisfied

28. **I would have participated in the educational series program even if I had not been pressured from work.**
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

29. **I would have participated in the educational series program only because I felt it was mandatory.**
- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
APPENDIX I (CONTINUED)

30. I would have participated in the educational series program only if the educational messages had come from the Clinical Education Department.

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

31. I would have participated in the educational series program only if I felt the information contained was pertinent to my everyday work.

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

32. I would have participated in the educational series program to gain personal knowledge even if not pertinent to my everyday work.

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

33. I would have participated in the educational series program even if I were on vacation.

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
APPENDIX I (CONTINUED)

34. I would have participated in the educational series program even if I were on leave of absence.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

35. I feel confident logging on and off email.
   - Not at all Confident
   - Not very Confident
   - Somewhat Confident
   - Very Confident

36. I feel confident sending an email message.
   - Not at all Confident
   - Not very Confident
   - Somewhat Confident
   - Very Confident

37. I feel confident replying to an email message.
   - Not at all Confident
   - Not very Confident
   - Somewhat Confident
   - Very Confident
APPENDIX I (CONTINUED)

38. I feel confident forwarding an email message.
   - Not at all Confident
   - Not very Confident
   - Somewhat Confident
   - Very Confident

39. I feel confident sending emails to more than 1 person at the same time.
   - Not at all Confident
   - Not very Confident
   - Somewhat Confident
   - Very Confident

40. I feel confident deleting emails.
   - Not at all Confident
   - Not very Confident
   - Somewhat Confident
   - Very Confident

41. I feel confident creating an email address book.
   - Not at all Confident
   - Not very Confident
   - Somewhat Confident
   - Very Confident
APPENDIX I (CONTINUED)

42. I feel confident opening an attachment.
   Not at all Confident
   Not very Confident
   Somewhat Confident
   Very Confident

43. I feel confident saving attachments to file, then opening file folder.
   Not at all Confident
   Not very Confident
   Somewhat Confident
   Very Confident

44. I feel confident attaching a file to email, then sending the email.
   Not at all Confident
   Not very Confident
   Somewhat Confident
   Very Confident

45. I feel confident clicking on a link to visit a specific web site.
   Not at all Confident
   Not very Confident
   Somewhat Confident
   Very Confident

46. I feel comfortable using a Blog.
   Strongly Disagree
   Disagree
   Agree
   Strongly Agree
APPENDIX I (CONTINUED)

47. I feel comfortable using email.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

48. I feel comfortable using Facebook.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

49. I feel comfortable using instant messaging via computer.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

50. I feel comfortable using Podcast.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
APPENDIX I (CONTINUED)

51. I feel comfortable using text messaging via cell phone.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

52. I feel comfortable using Twitter.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

53. I own this device (check all that apply):
   - Cell phone
   - Blackberry, Palm or Personal Digital Assistant (PDA)
   - Desktop Computer
   - Laptop Computer
   - Music iPod or MP3 Player
   - iPhone

54. I use this device (check all that apply):
   - Cell phone
   - Blackberry, Palm or Personal Digital Assistant (PDA)
   - Desktop Computer
   - Laptop Computer
   - Music iPod or MP3 Player
   - iPhone
55. I use the Internet for (check all that apply):
   - For Professional Growth (e.g. look up a new medication)
   - For personal growth (e.g. continuing education credits)
   - For pleasure (e.g. recipes, plan a vacation, shop)
   - Never

56. My age at my last birthday is ________________.

57. My gender is _________.
   - Male
   - Female

58. My ethnicity is _________.
   - American Indian
   - African American
   - Pacific Islander
   - Alaskan Native
   - Caucasian
   - 2 races or more
   - Asian
   - Hispanic
   - Other
59. My current marital status is _________.
   - Married
   - Separated
   - Cohabiting
   - Divorced
   - Single
   - Widowed
   - Other

60. My highest nursing degree completed is _________.
   - Associate
   - Master’s
   - Diploma
   - Doctorate
   - Bachelor’s

61. I have been a nurse for ____________ years.

62. My current employment status is _________.
   - Full time
   - Part time
   - Relief, PRN

63. The type of unit I work on is _________.
   - Med-Surgical (Medical, surgical, telemetry, oncology, etc)
   - Specialty (ICU, Burn, ED, PACU, Birth, NICU, PICU, OR, Endo, etc)
APPENDIX I (CONTINUED)

64. The shift I am primarily scheduled is ________.
   - Days
   - Evenings
   - Nights
   - Rotate

65. The primary day of the week I am scheduled is ________.
   - Weekday only
   - Weekend only
   - Rotate

66. The typical number of days per week I work is ________.
   - One
   - Two
   - Three
   - Four
   - Five
   - Six
   - Seven

67. The typical number of hours per day I am scheduled is ________.
   - Eight
   - Twelve
   - Other

68. Would you change anything about the Educational Messages?
APPENDIX J

PRE-SURVEY LETTER TO PARTICIPANTS

To: Frontline Registered Nurse - Participant

I would like to thank you for participating in a series of emailed educational messages from your manager over the last few weeks. The purpose of the emailed messages is to evaluate a strategy to disseminate information to dispersed frontline staff.

As nurses, you make up the majority of healthcare providers in hospitals and your role is highly dependent on information. Because you work to ensure patients are cared for twenty-four hours a day seven days a week, you present an additional challenge to your manager to disseminate information in a timely and efficient way. In today’s environment, nurses work a variety of schedules. Some full-time nurses work three 12-hour shifts a week – meaning that they are available Face-to-Face only three days a week for the Nurse Manager to disseminate important messages. Thus, many of you could be called a “dispersed employee” or distanced from the Nurse Manager.

Your feedback is important to me. The next part of this research study is to provide an evaluation regarding the emailed educational messages. In a couple of days, you will receive a survey via email designed for you to provide feedback.

As a small token of appreciation, completion of the survey will qualify you participate in a random drawing to win $75 in cash that will occur at the end of the second week.

I look forward to your feedback!

Thanks again for your participation!

Wanda Hughes, Principle Investigator
Administrative Director of Nursing, BRGMC
225-387-7779; email: wanda.hughes@brgeneral.org
APPENDIX K
SURVEY INVITATION TO PARTICIPANTS

Dear Frontline Registered Nurse,

A few days ago you received a message about completing a survey to evaluate the effectiveness of using email to disseminate educational messages to frontline nurses. With the rapid changes in healthcare today, communication to nurses is an important role for nurse managers.

Your responses will remain confidential. Individual responses will not be linked to your name. Email addresses will only be used for follow-up with non-responders. Once your survey is completed, your name will be removed from the non-respondent list and assigned a random identification number that will have no association with your name.

Your feedback is important to me. The survey should take about 15-20 minutes to complete. Please complete the survey by January 31, 2010. Your participation is voluntary; with completion of the survey indicating your consent to participate. If you have any questions, please don’t hesitate to call me at 387-7779.

As a small token of appreciation, completion of the survey will qualify you participate in a random drawing to win $75 in cash that will occur at the end of the second week.

To complete the survey, click at the link below or copy/paste the link into your Internet browser.

I look forward to your feedback! Thanks again for your participation!

Wanda Hughes, Principle Investigator
Administrative Director of Nursing, BRGMC
225-387-7779; email: wanda.hughes@brgeneral.org
**APPENDIX L**

**FIRST REMINDER LETTER TO PARTICIPANTS**

**Dear Frontline Registered Nurse:** Last week you received a message about completing a survey to evaluate the effectiveness of using email to disseminate educational messages to frontline nurses. With the rapid changes in healthcare today, communication to nurses is an important role for nurse managers. Your responses will remain confidential. Individual responses will not be linked to your name. Email addresses will only be used for follow-up with non-responders. Once your survey is completed, your name will be removed from the non-respondent list and assigned a random identification number that will have no association with your name. Your feedback is important to me. The survey should take about 15-20 minutes to complete. Please complete the survey by **February 13, 2010**. Your participation is voluntary; with completion of the survey indicating your consent to participate. If you have any questions, please don’t hesitate to call me at 387-7779. As a small token of appreciation, completion of the survey will qualify you participate in a random drawing to win $75 in cash that will occur **February 6, 2010**.

I look forward to your feedback! Thanks again for your participation!

Wanda Hughes, Principle Investigator
Administrative Director of Nursing, BRGMC
225-387-7779; email: wanda.hughes@brgeneral.org
APPENDIX M
SECOND REMINDER LETTER TO PARTICIPANTS

Dear Frontline Registered Nurse: I want to take this opportunity to thank each of you for your participation in the Joint Commission Survey last week. The nursing staff was unbelievably awesome!! The surveyors couldn’t say enough good things about nursing at The General 😊

As you know, I am conducting a research study to evaluate the effectiveness of disseminating educational messages to frontline nurses. I think communication is so important! With the crazy schedules nurses work, coupled with how fast things change in healthcare, we cannot always rely on staff meetings to get information to you. Your feedback is so important to me! Please take this opportunity to let your voice be heard & be a part of this important research study.

Emme Dusek was the winner of the $75 cash random drawing. Another random drawing will occur on February 13, 2010 for $25 cash!
I look forward to your feedback! Thanks again for your participation!

Wanda Hughes, Principle Investigator
Administrative Director of Nursing, BRGMC
225-387-7779; email: wanda.hughes@brgeneral.org
VITA

Wanda Gillespie Hughes was born in Baton Rouge to Earl and Roberta Gillespie. She graduated from Istrouma High School in 1972 and attended Louisiana State University. Wanda married a close high school friend, Mike Hughes, in September 1981 and they have two sons, Cary and Michael.

In May 1977, she received a Bachelor of Science in Nursing degree from Southeastern Louisiana University where she served as Student Nurse’s Association President. She later returned to Southeastern and received a Master of Science in Nursing degree graduating magna cum laude. She was selected as graduate student representative to the faculty and awarded with the Southeastern Louisiana University Distinguished Scholar Award. Her thesis was “The Effects of a Support Group for New Graduate Nurses on Self-Esteem, Social Support, and Job Satisfaction.”

A career in nursing for Wanda began in the critical care unit at the Baton Rouge General Medical Center. In her 34 year nursing career, she has assumed a variety of nursing leadership roles to include Administrative House Supervisor, Director of Nursing Operations, Director of Nursing, Director of Joint Commission and Regulatory, Interim Vice President of Nursing and Administrative Director of Nursing. She has served as adjunct faculty at Southeastern Louisiana University working with senior students in their management rotation. She has been responsible for development of policy and procedures, nursing standards of practice, staffing plans and budgets. She has led the preparation and implementation strategies for numerous regulatory surveys to include Joint Commission, Department of Health and Hospitals and Center for Medicare and Medicaid. Wanda has a special interest in quality improvement, became a Lean Six Sigma Green Belt in 2009 and has been appointed to oversee Emergency Management and Director of Quality and Patient Safety.
Wanda has received numerous awards and honors to include Louisiana State Nurses Association Foundation Nightingale Nurse Administrator of the Year, Baton Rouge General Edith Lobue Leadership Award, International Association of Hospital Survey Coordinators Joint Commission Hospital Turnaround of the Year Award and the Baton Rouge District Nurse’s Association Nurse of the Year Award. She is a member of the nursing leadership team awarded four times the Hospital of the Year by the Louisiana State Nurses’ Association Foundation Nightingale and the All Star Commitment to Advancing the Profession awarded by Advance for Nursing for Texas and Louisiana.

Wanda is a member of Who’s Who America’s Registry Outstanding Professionals, American Nurses Association, Louisiana State Nurses Association where she sits on the Audit and Finance Committee, the Baton Rouge District Nurses Association, Sigma Theta Tau International Nursing Honor Society, Sigma Theta Tau Rho Zeta Chapter International Nursing Honor Society where she served as Vice President 2008 – 2009, American Organization for Nurse Executives, Louisiana Organization for Nurse Executives, Honor Society of Phi Kappa Phi, Louisiana Hospital Association Education Committee and serves on the Board of Healthcare Centers in Schools for East Baton Rouge Parish. Wanda has had numerous speaking engagements. She wrote an unpublished white paper “Analysis of JCAHO Accreditation” and authored in the journal JCAHO Environment of Care News Preventing Infant Abduction in Baton Rouge. The degree of Doctor of Philosophy will be conferred by Louisiana State University at the May 2010 commencement ceremony. Wanda’s email is wanda.hughes@brgeneral.org.