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What is the Relationship among Team Psychological Safety, Nursing Agency, and Rapid Response System Activation?

Grace Mingsum Ng
The Graduate Center, City University of New York

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WHAT IS THE RELATIONSHIP AMONG TEAM PSYCHOLOGICAL SAFETY, NURSING AGENCY, AND RAPID RESPONSE SYSTEM ACTIVATION?

by

GRACE MINGSUM NG

A dissertation submitted to the Graduate Faculty in Nursing in partial fulfillment of the requirements for the degree of Doctor of Philosophy
The City University of New York
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by

Grace Mingsum Ng

This manuscript has been read and accepted by the Graduate Faculty in Nursing in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

Date

Donna M. Nickitas
Chair of Examining Committee

Date

Martha V. Whetsell
Executive Officer

Supervisory Committee:

William Gallo
Timothy Clapper
Daniel Raemer

THE CITY UNIVERSITY OF NEW YORK
ABSTRACT

What is the Relationship among Team Psychological Safety, Nursing Agency, and Rapid Response System Activation?

by

Grace Mingsum Ng

Advisor: Professor Donna M. Nickitas

When patients show signs of clinical deterioration, nurses should activate the rapid response system (RRS) to summon specialized help to the bedside. Failure or delay to activate the RRS is associated with increased length of stay and increased mortality. Currently, nurses only activate the RRS 21-57% of the time. Nurses’ fear of criticism for making the wrong call has been identified as a reason for avoiding or delaying activation. Currently, only limited individual level factors affecting nurse RRS activation have been identified, but team-level barriers or facilitators or nurse RRS activation have not been systematically studied. A cross-sectional study was conducted to investigate the relationships among team psychological safety, nursing agency, and nurse RRS activation. Findings suggest that nurses’ personal sense of power, which may be a foundational disposition of nursing agency, is a predictor of nurse RRS activation. Strategies to develop nurses’ personal sense of power may be key to ensure nurses can exercise their full agency to overcome barriers and act on behalf of their patients.

Keywords: rapid response system, facilitators, nursing agency, personal sense of power.
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Chapter 1: Introduction and Background

Introduction

Up to 30 million adult patients are admitted to the hospital in the United States (US) annually (Weiss & Elixhauser, 2014). Each year, five to ten percent, or 1.5 million to 3 million, of these patients suffer unexpected significant clinical deterioration during their hospital stay resulting in cardiac arrest, or requiring transfer to the intensive care unit (ICU) (Churpek, Yuen, Park, Gibbons, & Edelson, 2014; Sandroni, D’Arrigo, & Antonelli, 2015). While the deterioration may appear sudden, research demonstrated at least 80% of these patients showed subtle but detectable signs of deterioration for 8-24 hours before an acute life-threatening event occurs (Buist, Bernard, Nguyen, Moore, & Anderson, 2004; Hillman et al., 2002; Hillman et al., 2001). The common signs of deterioration are hypotension, tachypnea, tachycardia, and mental status changes (Hillman et al., 2002; Schein, Hazday, Pena, Ruben, & Sprung, 1990). Nurses play a vital role in identifying unexpected clinical deterioration in hospitalized patients and intervening rapidly to stabilize the patient (Lucero, Lake, & Aiken, 2010; Massey, Chaboyer, & Anderson, 2016).

As the only profession that maintains a continuous presence at the bedside, nurses have a fundamental role in frontline patient surveillance and intervention (Aiken & Patrician, 2000; Kutney-Lee, Lake, & Aiken, 2009). When nurses recognize signs of deterioration, they are expected to intervene by activating the Rapid Response System (RRS) (Massey et al., 2016; Odell, Victor, & Oliver, 2009). The RRS was developed as a tool to rapidly identify and rescue deteriorating patients (Berwick, Calkins, McCannon, & Hackbarth, 2006; DeVita et al., 2006). The premise behind RRS is once healthcare providers recognize signs of deterioration, they
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should activate the RRS to bring a specialized, interdisciplinary team of critical care personnel to the deteriorating patient’s bedside to stabilize the patient, or to expedite transfer to the ICU.

Nurses are the primary activators of RRS (Adelstein et al., 2011; Bagshaw et al., 2010; Lee, Bishop, Hillman, & Daffurn, 1995; Marshall et al., 2011). However, even though nurses are expected to make the autonomous decision for RRS activation, research found that nurses activated the RRS in only 21% - 57% of patients who met criteria (Barwise et al., 2016a; Calzavacca et al., 2010; Chen et al., 2015; MERIT Investigators, 2005). Nurses cited fear of criticism from colleagues as a primary reason for avoiding RRS activation (Astroth, Woith, Stapleton, Degitz, & Jenkins, 2013; Azzopardi, Kinney, Moulden, & Tibballs, 2011a; Bagshaw et al., 2010a). Nurses reported that when they activated the RRS, colleagues made deriding comments such as “You called the rapid response team for this?” (Pusateri, Prior, & Kiely, 2011; Williams, Newman, Jones, & Woodard, 2011). This finding is alarming because patients’ lives are at risk when nurses’ fear of criticism inhibits their decision for RRS activation.

When patients cannot act for themselves, nurses must be able to exercise their agency to make life-saving decisions without inhibitions (Orem, 2001). Nursing agency is a key theoretical concept in Orem’s (2001) Self-Care Deficit Nursing Theory. It refers to nurses’ capabilities and power to act deliberately to provide safe, effective nursing care (Banfield, 2011b; Orem, 2001). To provide the highest quality nursing care possible, nurses must exercise nursing agency without inhibitions. When patients deteriorate, nurses must use their agency to activate the RRS.

Factors that enable or inhibit nursing agency may be present in the nurse practice environment (Orem, 2001). Previous research identified team psychological safety (Edmondson, 1999) as a factor in the environment associated with improved patient outcomes. Team psychological safety refers to the shared belief in a team that the team is safe for admitting
weaknesses and seeking help (Edmondson, 1999). For example, team psychological safety is a factor that enabled nurses to speak up about patient safety concerns in the operating room (Edmondson, 2003). However, the relationship between team psychological safety, nursing agency, and RRS activation is not clear. This study will examine the relationships between team psychological safety, nursing agency, and nurse RRS activation.

**Problem Statement**

Currently, nurses activate the RRS in only 21-57% of patients who show signs of clinical deterioration (Barwise et al., 2016a; Calzavacca et al., 2010; Chen et al., 2015; MERIT Investigators, 2005). Additionally, nurses reported understanding the purpose and benefits of RRS (Jackson, Penprase, & Grobbel, 2016a; Jones et al., 2006a; Stolldorf, 2016), as well as knowing the process of activation (Azzopardi et al., 2011; MERIT investigators, 2005; Jones et al., 2006; Pusateri et al., 2011). However, nurses’ failure to activate the RRS remains a persistent problem despite positive nurse perceptions of the RRS (Azzopardi et al., 2011; MERIT investigators, 2005; Jackson, Penprase, & Grobbel, 2016; Jones et al., 2006; Leach & Mayo, 2013; Pusateri, Prior, & Kiely, 2011; Roberts et al., 2014; Stolldorf, 2016; Williams, Newman, Jones, & Woodard, 2011). Factors inhibiting nurse RRS activation need to be identified.

Failure to activate the RRS is associated with unplanned ICU admissions, increased morbidity, increased length of stay, and death (Azzopardi et al., 2011a; Barwise et al., 2016a; Berwick et al., 2006; Boniatti et al., 2014; Calzavacca et al., 2010; Chen et al., 2015; MERIT Investigators, 2005; Morrison et al., 2013; Odell, 2015; Shearer et al., 2012; Tirkkonen et al., 2013; Trinkle & Flabouris, 2011). Patient death attributed to failure to recognize deterioration and intervene appropriately is termed failure to rescue (FTR) (McKee, Coles, & James, 1999; Silber et al., 2007; Silber, Williams, Krakauer, & Schwartz, 1992). FTR had been identified as a
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nurse-sensitive quality indicator by the National Quality Forum (2004), as well as named as a serious patient safety issue by the Agency for Healthcare Research and Quality (2015) and The Joint Commission (2009).

To date, studies have only focused on identifying individual reasons for nurses avoiding RRS activation, such as fear of criticism (Astroth et al., 2013; Azzopardi et al., 2011a; Bagshaw et al., 2010a; Johnston, Arora, King, Stroman, & Darzi, 2014; Shearer et al., 2012). However, nurses do not work in isolation as individuals, but instead, work as members of healthcare teams with other nurses and healthcare providers (O’Daniel & Rosenstein, 2008). Yet, team-level factors that may affect nurses’ agency for RRS activation have not been studied. Team psychological safety (Edmondson, 1999) is identified as a team-level factor strongly associated with positive patient outcomes. Currently, the relationship between team psychological safety and nurses’ agency for RRS activation has not been investigated.

Need for Study

This cross-sectional study is needed to: (1) determine whether team psychological safety is a team-level factor in the nurse practice environment that may affect nurse RRS activation; (2) determine whether nursing agency is an individual-level factor that may have an impact on nurse RRS activation; and (3) advance nursing science by testing key concepts in Orem’s (1971/2001) Self-Care Deficit Nursing Theory.

In order to fully understand the phenomenon of nurse RRS activation, factors that affect this phenomenon need to be systematically examined at the organizational level (macro-level) (Schein, 2010; Wagner III & Hollenbeck, 2014), the team level (meso-level) (Mullins, 2010; Wagner III & Hollenbeck, 2014), as well as the individual level (micro-level) (Mullins, 2010; Wagner III & Hollenbeck, 2014) (Figure 1). Currently, while organizational level factors have
already been well studied, but team-level factors and individual-level factors have only been minimally examined. Furthermore, to date, studies on nurse RRS activation that is informed by nursing and organizational theories have not been conducted.

**Figure 1. Macro level, Meso level, and Micro level**

Growing evidence over the past 16 years shows organizational-level factors that support professional nursing practice have substantial impacts on patient outcomes, including decreased mortality, and up to a 20% decrease in FTR rates (Aiken, Havens, & Sloane, 2000; Aiken & Patrician, 2000; Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Friese, Lake, Aiken, Silber, & Sochalski, 2008; Lake, 2002, 2007; Lucero et al., 2010; Silber et al., 2016). Key organizational characteristics of a professional nurse practice environment include the following: hospital structure and policies that support nurse participation in hospital affairs, strong nursing control for decisions around quality of care issues, nursing leadership and administration that advocate for bedside nurses, adequate nurse staffing, and collegial nurse-physician relationships
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(American Association of Colleges of Nursing, 2002; Lake, 2002). Even though the organization-level studies were not specifically focused on nurse RRS activation, the decrease in FTR rates found in multiple studies points to deliberate actions taken to rescue deteriorating patients, such as developing organizational policies to identify at-risk patients (Aiken et al., 2000; Aiken & Patrician, 2000; Aiken et al., 2008; Friese et al., 2008; Lake, 2002, 2007; Lucero et al., 2010; Silber et al., 2016). Given the substantial evidence in the literature, further study of organizational-level factors was not a focus in this study.

However, gaps exist in studying team-level factors that may affect nurse RRS activation. No studies have been focused on identifying team-level factors that can explain why in some teams, nurses were able to overcome barriers for RRS activation, but in other teams, nurses hesitated or avoided RRS activation even when indicated (Azzopardi et al., 2011a; Bagshaw et al., 2010a; Jones et al., 2006a).

RRS activation involves staff nurses making a judgment call and taking the risk of being criticized for making the wrong call (Braaten, 2015). Nurses may hesitate or avoid taking the risk, especially when signs of deterioration are subtle (Braaten, 2015; Roberts et al., 2014). Nurses may perceive the threat of potential mistakes and resulting embarrassment as sufficiently high that they avoid activating the RRS altogether (Edmondson, 2003; Edmondson, 1999). Alternatively, they delay their decision-making until the deterioration becomes life threatening (Edmondson, 2003). Team psychological safety may be a major factor in nurses’ accepting or avoiding the risks of RRS activation at the team level (Edmondson, 2003). Team psychological safety refers to the shared belief held by members of a team that the team is safe for “interpersonal risk taking” (Edmondson, 1999). Interpersonal risk taking refers to doing or saying something that may lead to a goal, but also may result in being judged or criticized by
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others in one’s social or work environment (Edmondson, 1999; Lundstedt, 1966). Edmondson (1999) measured the perceived team psychological safety level of 51 work teams and found that team psychological safety is correlated with the frequency of behaviors that involve some interpersonal risks but can lead to learning and improvement. These practices include: asking for help, speaking up, admitting errors, seeking feedback, and accepting differences in opinions. Edmondson (1999) also referred to these behaviors as team learning behavior. Team learning behavior is in turn correlated with team performance (Edmondson, 1999) and patient outcomes (Edmondson, 2003, 2004).

Nurses work with other nurses as well as other healthcare providers in teams (O’Daniel & Rosenstein, 2008). When the team is psychologically safe, nurses do not fear being rejected or harshly judged if they speak up or make a wrong decision (Detert & Edmondson, 2011; Edmondson, 2003; Edmondson, 1999). Rather, they may be more likely to take the interpersonal risk to activate the RRS. To date, he role of team psychological safety as a team-level factor in nurse RRS activation has not been studied.

Also, gaps may exist for individual-level factors that affect nurse RRS activation. Nurses continue to cite fear of criticism as a major barrier for RRS activation even when indicated (Astroth et al., 2013; Azzopardi et al., 2011a; Bagshaw et al., 2010a). However, individual-level factors may explain why some nurses’ fear of criticism was sufficient to inhibit activating the RRS, while other nurses overcame barriers, have not been identified. Nursing agency may be an individual-level factor that may explain nurse RRS activation.

Orem (1971/2001) identified nursing agency as a key theoretical concept in her Self-Care Deficit Nursing Theory (SCDNT). Nursing agency refers to the power, ability of the nurse to design nursing care, and implement deliberate nursing actions for patients who are unable meet
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their health needs (Banfield, 2011b; Orem, 2001). When patients deteriorate, they are unable to meet their basic health needs of respiration or circulation. Activating the RRS is a critical nursing action that can save a patient’s life. It may be that nurses need to exercise their nursing agency to overcome their fear of criticism. Otherwise, the cost of not exercising nursing agency is the patient’s health or life. To date, nursing agency has only been minimally examined in empirical studies (Biggs, 2008). Nursing agency’s role as an individual-level factor in nurse RRS activation has not been studied.

When working as intended, the RRS is effective in decreasing in-hospital cardiac arrests, length of stay, ICU admissions, and mortality (Aneman, Frost, Parr, & Hillman, 2015; Angel, 2016; Barwise et al., 2016a; Chan, Jain, Nallmothu, Berg, & Sasson, 2010; Maharaj, Raffaele, & Wendon, 2015; Winters et al., 2013). However, the RRS’ full effectiveness is undermined when nurses’ agency for RRS activation is inhibited (Chen et al., 2015; MERIT Investigators, 2005). Understanding the roles of team psychological safety and nursing agency may be a critical step in enabling nurse RRS activation, which may, in turn, improve patient morbidity and failure to rescue in hospitals.

**Theoretical Framework**

Orem’s Self-Care Deficit Nursing Theory (SCDNT) (Orem, 1971/2001) provides the conceptual framework for this study. Orem’s theory is comprised of three interlocked sub-theories: Theory of Self-Care, Theory of Self-Care Deficit, and Theory of Nursing Systems. According to Orem, the Theory of Nursing Systems incorporates the Theory of Self-Care Deficit, which in turn includes the Theory of Self-Care (Orem, 2001, p.141) (Figure 2). This study will focus only on the Theory of Nursing Systems as a framework to describe and explain
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the phenomenon of nurse RRS activation.

Figure 2. Three Sub-Theories of the Self-Care Deficit Nursing Theory

**Theory of Nursing Systems.** According to Orem (1971/2001), the role of the nurse is to assist patients when patients’ ability to engage in self-care is limited or impaired. To help patients, nurses need to perform deliberate actions. A series and sequences of deliberate nursing actions are known as a nursing system (Orem, 2001). Orem (2001, p.350) described three types of nursing systems: (1) Wholly compensatory, where the patient is unable to engage in self-care actions, and the nurse acts for the patient, (2) Partially compensatory, where the patient can engage only in some self-care actions, and the nurse compensates by engaging in some nursing actions to assist the patient, and (3) Educative-Supportive, where the patient can engage in most or all self-care actions, and the nurse supports patients via education and counseling. When patients deteriorate, they can no longer engage in self-care actions. A wholly compensatory nursing system is needed to help meet the legitimate health needs of the deteriorating patient.
Activation of the RRS is a critical initial deliberate action within the wholly compensatory nursing system.

**Nursing Agency as a Theoretical Concept.** The Nursing Development Conference Group (NDCG) led by Orem (1971) formalized nursing agency as the nurse variable in the SCDNT. Nursing agency is defined as “a set of developed and developing capabilities that persons who are nurses exercise in the provision of nursing for individuals or groups” (Orem, 2001, p. 289). The exercise of nursing agency enables the nurse to design and implement nursing systems appropriate for the level of legitimate needs for patients under the nurse’s care (Orem, 2001, p.289). In the context of patient deterioration, nurses need to exercise their nursing agency to activate the RRS.

Although nursing agency has been named as a major theoretical concept in the SCDNT (Orem, 2001), this concept is not fully developed (Banfield, 2011b). To date, the substantive structure of nursing agency has not been explicitly described in Orem’s work and has only been minimally examined in empirical studies (Biggs, 2008). Nurse researchers are encouraged to further develop the concept and conduct empirical studies to test the constructs (Banfield, 2011b; Biggs, 2008; Hartweg, 1991).

To do so, researchers may need to reference the concept of self-care agency (Banfield, 2011b). In her most recent edition of Nursing: Concepts of Practice (2001), Orem proposed that the nursing agency is analogous to self-care agency, the difference being self-care agency is developed and exercised for the benefit of the self, and nursing agency is developed and exercised for the interest of patients (Banfield, 2011b). Self-care agency refers to the power and capabilities to engage in actions to care for one’s self about health (Orem, 2001, p.254). Self-care agency has been well developed in Orem’s theory and well-studied in the literature (Biggs,
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2008). For this study, the structure and select constituent constructs of self-care agency will be discussed below to draw parallels for potential constructs of nursing agency.

**Substantive Structure of Self-Care Agency.** The substantive structure of self-care agency consists of three articulating parts: (1) foundational capabilities and dispositions, (2) power components, or enabling capabilities of the patient, and (3) capabilities for self-care operations (Orem, 2001). The concept and its structure were formed by the works of the Nursing Development Conference Group (NDCG) led by Orem (1971). In their seminal paper, Gast et al. (1989) further developed the concept by describing the three parts as a pyramid-shaped structure, with capabilities for operations at the top, power components in the middle, and foundational capabilities and dispositions at the base (Figure 3). In this study, only foundational dispositions of self-care agency is discussed for the purpose of inferring potential constructs for foundational dispositions of nursing agency. Foundational capabilities, power components, and capabilities of self-care operations will not be discussed.
Foundational dispositions refer to the personal traits and qualities that affect one’s enabling capabilities to seek health-related goals (Orem, 2001, p.261). Many dispositions named in the SCDNT are self-oriented psychological constructs drawn from the field of cognitive development and social psychology (Orem, 2001, p.264). For example, self-concept, self-awareness, self-value, and self-acceptance were named by Orem (Orem, 2001, p.262-263). According to Orem (2001, p. 264), the list of named dispositions is not considered finalized. New foundational dispositions may be identified and incorporated. For example, self-esteem (Anderson & Olnhausen, 1999) and perception of power (Lee, 1999) were identified as a foundational dispositions.

**Substantive Structure of Nursing Agency.** Orem (2001, p.289) described the structure of nursing agency as analogous to that of self-care agency, consisting of three articulating, interrelated parts (Banfield, 2011b): (1) foundational capabilities and dispositions, (2) power
components, or enabling capabilities of the nurse, and (3) capabilities of performing nursing operations (Figure 4). To date, several studies focused on the power components have been conducted (Bennett, 1993; Shih, 1996; Vincent, 1999; Rice, 2000; Watson, 2002; Hines et al., 2007), but no studies are investigating the foundational capabilities of nursing agency have been found. This study was restricted to investigating a select potential foundational disposition, and a select power component.

![Image of diagram](image.png)

*Figure 4. The Substantive Structure of Nursing Agency*

**Foundational Dispositions of Nursing Agency.** Orem proposed that foundational dispositions for nursing agency are analogous to the foundational dispositions for self-care agency (Orem, 2001, p.289), without further elaboration. In the latest edition of her work, Orem (2001, p.291-292) described a suggested list of desirable nurse characteristics. However, to date, the content of the list has not been conceptualized into foundational dispositions. Based on Orem’s proposal, it may be inferred that foundational dispositions for nursing agency, analogous
to foundational dispositions for self-care agency, would also be self-oriented psychological constructs. Additionally, analogous to the proposed self-care agency structure, foundational dispositions of nursing agency would affect the nurse’s enabling capabilities to seek goals related to the health of the patient. Given that Orem holds the view that articulation of knowledge from other disciplines is necessary for development of nursing theories (Orem, Renpenning, & Taylor, 2003), this study proposes that nurses’ personal sense of power (Anderson & Galinsky, 2006; Anderson, John, & Keltner, 2012), a self-oriented psychological construct developed from the discipline of social psychology, may be a potential foundational disposition affecting power components of nursing agency.

**Personal Sense of Power as a Potential Foundational Disposition.** Personal sense of power is defined as the “perception of one’s ability to influence others” (Anderson & Galinsky, 2006; Anderson et al., 2012). Personal sense of power is different from the traditional view of power, which referred to one’s ability to control resources (Keltner, Gruenfeld, & Anderson, 2003). It is also different from positional or structural power, where an individual’s power is based on his or her social position or status in an organization. There is evidence to show that personal sense of power is an internal trait (Anderson et al., 2012) associated with increased willingness to take risks, and higher optimism regarding the outcomes of risk-taking (Anderson & Galinsky, 2006).

Personal sense of power is of interest in this study as a potential foundational disposition. When patients deteriorate, nurses need to influence other healthcare providers to support their decision to activate the RRS. This is an important step, especially if signs of deterioration are subtle and only apparent to the nurse surveilling the patient over a period. Nurses whose personal sense of power is weak may fear that support for RRS activation will be lacking, and hesitate to
activate. On the other hand, nurses with a strong sense of personal power may think that can influence others to support their decision to active the RRS, and move ahead to do so without hesitation.

Additionally, nurses may perceive activating the RRS as a risk that may result in criticism and embarrassment. Nurses with a weak personal sense of power are less willing to take the risk and may view the potential criticisms and embarrassment as a strong threat. On the other hand, nurses with a strong personal sense of power may be more willing to take the risk and call a rapid response, and perceive the potential criticisms risk as minimal. Even though the personal sense of power has not been explicitly named in Orem’s work, conceptually it meets the criteria to qualify as a foundational disposition (Orem, 2001, p. 263-264), and merits investigating in this study.

**Power Components of Nursing Agency.** Orem (2001) identified eight power components, or enabling capabilities of the nurse: (1) valid and reliable knowledge in the three dimensions of nursing practice (social, interpersonal, and professional-technologic), (2) intellectual and practical skills specific to these three areas, (3) sustaining motives, (4) willingness to provide nursing, (5) ability to unify direct action sequences toward result achievement, (6) consistency in performing nursing operations, (7) making adjustments in nursing operations because of prevailing or emerging conditions, and (8) the ability to manage self as the essential professional operative element in nursing practice situations (Orem, 2001). This study is limited to investigating the fourth power component, *willingness to provide nursing care*, as a power component that may be affected by nurses’ person sense of power.

**Willingness to Activate the RRS as a Power Component.** This study will consider the power component congruent with the fourth power component, willingness to provide nursing,
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as the willingness to activate the RRS. In the context of patient deterioration, activating the RRS is a critical initial step in providing nursing care in a wholly compensatory nursing system. Orem’s (2001, p.257) framework proposes that foundational capabilities have an influence on power components. This study suggests that nurses’ personal sense of power influences nurses’ willingness to activate the RRS.

**Basic Conditioning Factors.** Basic conditioning factors (BCFs) are considered peripheral concepts in the SCDNT. BCFs refer to factors internal or external to the nurse that inhibit or enable nursing agency.

Orem (2001) identified the following as BCFs: (1) age, (2) gender, (3) developmental state, (4) health state, (5) sociocultural orientation, (6) healthcare system factors, (7) family system factors, (8) patterns of living, (9) environmental factors, and (10) resources availability/adequacy. To date, the linkage between BCFs and nursing agency has been minimally tested (Banfield, 2011a). Additionally, although Orem (2001) identified a list of BCFs, according to Banfield (2011b), the list is not considered to be finalized. Additional BCFs may be identified. This study proposes team psychological safety may be a BCF congruent with Orem’s (Orem, 2001) framework. Currently, while team psychological safety was not specifically named as a BCF, it may be a team-level factor in the healthcare system. This study proposes to test the influence of team psychological safety as a BCF on nurses’ willingness to activate the RRS.

**SCDNT as a Framework for Investigating Nurse RRS Activation.** Orem’s (Orem, 2001) conceptual framework links BCFs, foundational capabilities and power components of nursing agency. Figure 5 below depicts the proposed relationships among the theoretical concepts and variables. In this proposed relationship, there is an indirect relationship between the
Figure 5. Proposed relationships among Orem's theoretical concepts and variables

Basic Conditioning Factors

External:
- Team Psychological Safety

Basic Conditioning Factors

Internal:
- Age
- Education level (AAS, BSN, MSN, Doctoral)
- Years of practice
- Gender
- Specialty certification

Nursing Agency

Power Component:
- Willingness to activate RRS

Foundational Disposition:
- Personal sense of power

Nursing System

Wholly compensatory
- RRS activation
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foundational disposition of nursing agency and the wholly compensatory nursing system. Instead, it is mediated by the power component of nursing agency. These proposed relationships may explain the paradox of why nurses avoided or delayed activating the RRS, even though they recognized clinical deterioration, and knew the activation criteria.

According to Orem (2001, p. 268, 294), nursing agency can be considered regarding its (1) development, (2) operability, and (3) adequacy. Development of nursing agency is expected to result from participation in foundational and professional nursing education programs. These programs may encompass mastery of knowledge, psychomotor skills, and moral development. Operability of nursing agency refers to whether nurses exercise their agency to provide care for their patients. Adequacy of nursing agency refers to whether nurses have the appropriate set of knowledge and skills to provide care for their assigned patients.

Banfield (2011b) proposes that nurses may develop their nursing agency, but cannot exercise, or operate, it. Factors internal or external to the nurse may affect whether the nurse operates nursing agency (Banfield, 2011a, 2011b; Orem, 2001). When hospitalized patients start to deteriorate, the operability of nursing agency is critically needed for nurses to activate the RRS. However, even though nurses’ agency may be developed as a result of participation in RRS activation education programs, their agency may still be inoperable due to the inhibiting influences, such as low personal sense of power as a foundational disposition, and low team psychological safety as a BCF. Both of these elements may have an inhibiting influence on a select power component, conceptualized in this study as nurses’ willingness to activate the RRS. If this is the case, nurses would still be unable to activate the RRS despite having appropriate knowledge and attitudes on RRS activation.
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**Hypotheses**

1. Nurses’ activating the RRS is positively related to team psychological safety.
2. Nurses’ activating the RRS is positively related to personal sense of power.
3. The association between nurses’ activating the RRS and team psychological safety and personal sense of power is mediated by nurses’ willingness to activate the RRS.

**Aim of Study**

This cross-sectional study aims to 1). Investigate the relationships between team psychological safety, personal sense of power, and nurse RRS activation. 2). Test the concepts in the SCDNT in the specific context of nurse RRS activation (Silva & Sorrell, 1992): nursing agency foundational disposition, nursing agency power component, basic conditioning factors, wholly compensatory nursing system.

**Definitions**

**Rapid Response System Activation (RRSA)**

*Conceptual definition:* RRSA is conceptually defined as a nurse calls the rapid response team to the bedside for a patient who meets pre-determined clinical deterioration criteria, using a protocol pre-determined by the hospital. (“Institute for Healthcare Improvement: Rapid Response Teams,” n.d.)

*Operational Definition.* The response to two questions:

1. In the last 12 months, did you take care of at least one patient whom you felt needed to be seen by the rapid response team?” (Yes/No)

2. “In the past 12 months, have you activated the rapid response system?” (Yes/No)

**Team Psychological Safety (TPS)**
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**Conceptual definition:** TPS is conceptually defined as the shared belief held by members of a team that the team is safe for interpersonal risk taking (Edmondson, 1999).

**Operational Definition:** The score on the 7-item Team Psychological Safety Subscale in the Team Learning and Psychological Safety Survey (Edmondson, 1999).

**Nursing Agency**

Nursing agency is conceptually defined as the power and ability of the nurse to design and implement nursing care for individuals who cannot meet their own healthcare needs (Banfield, 2011b; D Orem, 2001). Nursing agency has not been measured directly as a variable in empirical research (Biggs, 2008). In this study, nursing agency is viewed as a latent variable that needs to be inferred from other variables: nursing agency foundational disposition, and nursing agency power component.

**Nursing Agency Foundational Disposition (NAFD)**

**Conceptual definition:** NAFD is conceptually defined as the nurses’ personal traits and qualities that affect the nurses’ enabling capabilities to seek health related goals for the patient (Orem, 2001).

**Operational definition:** The score on the 7-item Personal Sense of Power Scale (Anderson et al., 2012)

**Nursing Agency Power Component (NAPC)**

**Conceptual definition:** NAPC is conceptually defined as the nurses’ willingness to activate the RRS.

**Operational definition:** The score on the questions:

- I am willing to activate the rapid response team if I am worried about my patient.
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- I am willing to activate the rapid response team for a patient I am worried about even if the vital signs are normal.
- If my patient meets the rapid response team activation criteria but does not look unwell, I am not willing to activate the rapid response team.

Age

**Conceptual definition:** Age is conceptually defined as the chronological age of the nurse rounded to the nearest number of years.

**Operational definition:** The response to the Age question on the demographics questionnaire.

Years of Practice

**Conceptual definition:** Years of practice is conceptually defined as the number of years the nurse had practiced as a registered nurse rounded to the nearest number of years.

**Operational definition:** The response to the years of practice question on the demographics questionnaire.

Education level

**Conceptual definition:** Education level is conceptually defined as the highest degree in nursing that the nurse has earned.

**Operational definition:** The response to the highest degree in nursing question on the demographics questionnaire.

Gender

**Conceptual definition:** Gender is conceptually defined as the self-identified gender of the nurse.
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**Operational definition:** The response to the gender question on the demographics questionnaire.

**Specialty Certification**

**Conceptual definition:** Specialty certification is conceptually defined as having been granted the use of a time-limited recognition and credential specific to a nursing specialty (American Nurses Credentialing Center, n.d.).

**Operational definition:** The response to the specialty certification question on the demographics questionnaire.

**Advanced Cardiac Life Support (ACLS) Certification**

**Conceptual definition:** ACLS certification is conceptually defined as having been granted the use of the American Heart Association (AHA) ACLS for Healthcare Providers Course Completion Card (“American Heart Association,” n.d.).

**Operational definition:** The response to the ACLS certification question on the demographics questionnaire.

**Delimitations**

This study is delimited to registered nurses with associate’s degree in nursing, baccalaureate degree in nursing, master degree in nursing, doctor of nursing practice, Ph.D. in nursing, who are working in non-ICU adult inpatient areas in academic medical centers in a metropolitan area in the northeast of the US. The participants must have at least one year of adult nursing care experience, currently work as staff nurses in non-management positions, whose primary responsibility is bedside care. Additionally, participants must be able to read and write English.

**Limitations**
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This proposed study has the following limitations: The self-report nature of the data is a limitation, as the validity of the data is dependent upon the participant’s truthfulness, the ability for recall and introspection, their understanding or interpretation of the questionnaire items, as well as their personal biases.

The nature of sampling is also a limitation on the generalizability of the findings. The purposive nature of sampling in this study may limit the generalizability of the findings. Additionally, those who elect to participate in the study may respond differently from those who chose not to participate, and therefore they may not be representative of the populations studied.

Significance

Nurses are in a key position to lead positive changes in healthcare quality and patient safety (Institute of Medicine, 2010). As the largest segment of the healthcare workforce, nurses play a vital role in advancing the nations’ health (Health Resources and Services Administration, 2010). There are 2.8 million Registered Nurses in the workforce from 2008 to 2010 (Health Resources and Services Administration, 2010). Nurses comprise the largest component of hospital staff, are the primary providers of patient care in acute and long-term care settings. They are involved in most of the healthcare services delivered in the U.S., including direct patient care, case management, quality assurance, and developing policies and standards. Nurses work in a wide range of settings including acute care, long-term care, private practices, schools, home health, insurance and managed care companies, education, military, private corporations, and research institutions (American Association of Colleges of Nursing, 2015; Bureau of Labor Statistics, U.S. Department of Labor, 2015). The size and scope of nursing practice in the U.S. is one of the reasons that nursing can and should be a full partner in redesigning healthcare in the U.S. (Institute of Medicine, 2010).
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Despite having a vital role in healthcare, nurses have traditionally been disproportionately negatively affected by dysfunctional dynamics in patient care teams (Guidroz, Wang, & Perez, 2012; Hanrahan, Aiken, McClaine, & Hanlon, 2010; Higgins & MacIntosh, 2010; Karanikola et al., 2014; MacKusick & Minick, 2010; Stein, 1967; Stein, Watts, & Howell, 1990).

Psychologically safe teams (Detert & Edmondson, 2011; Edmondson, 2003) can enable nurses to take critical actions and speak up, leading to safer, higher quality care at the bedside. Additionally, to lead change on an organization and societal level, nurses must speak up and address disparities in the healthcare system. Teams involved in redesigning healthcare need to foster psychological safety so that nurses can be part of the team to the full extent of their abilities, without fear of their voices being silenced. The findings of this study can serve as a basis for understanding the impact of team psychological safety on nurses’ willingness to engage in the critical discourse involved in leading change and redesigning the healthcare system.

On an individual level, nurses must exercise their agency to provide high quality, safe care at the bedside. It is also essential that nurses exercise their agency to impact the healthcare system beyond the bedside. To do so, nurses may need to have a heightened sense of personal power that enables them to act and influence others nurses and healthcare providers, administrators, patients, families, even communities and law makers. Findings of this study may generate additional future research questions related to individual-level, team-level, organizational level, and even societal-level factors impacting patient safety and healthcare quality.

Summary

Nurse activation of the RRS when patients show signs of clinical deterioration remains a persistent problem. Despite having the knowledge and generally positive attitudes towards RRS
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activation, nurses do not consistently activate the RRS when indicated, leading to unplanned ICU admissions, increased morbidity, increased the length of stay, and death. Nursing agency and team psychological safety may be key factors influencing nurse RRS activation. Orem’s (2001) Self-Care Deficit Nursing Theory provides a conceptual framework to examine the proposed relationship between the variables. This chapter addressed the background, problem, need for study, aim for study, theoretical framework, research questions, the definition of terms, and significance of the proposed study. Chapter 2 will address the literature review.
Chapter 2: Review of the Literature.

Search Strategy

A literature review was performed using the methods described in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement guidelines (Moher, Liberati, Tetzlaff, Altman, & Group, 2009). First, a scoping review was conducted initially for literature related to the study variables: (1) Nurse RRS activation, (2) Nurse willingness to activate the RRS, (3) Personal sense of power, and (4) Psychological safety. Then, a literature search was conducted on peer-reviewed publications published between 2012-2017. CINAHL, MEDLINE (PubMed), ProQuest Central, PsycINFO, Web of Science, and JSTOR were searched. Keywords included: Nurse, rapid response team, rapid response system, medical response team, medical response system, psychological safety, team, power, influence, willingness, attitude, perception. Boolean operators “AND” and “OR” were applied as necessary.

A hand search was also conducted in addition to the database search. Reference lists of selected publications were reviewed, and Google Scholar was also searched, to identify relevant articles not found in the databases. In some cases, seminal studies published before 2012 that may still be relevant are also considered.

All title and abstracts were assessed for relevance. Citations not directly related to nurse activation of the RRS, personal sense of power, team psychological safety, and nurse willingness to activate the RRS were removed. Conference abstracts, editorials, letters to editors, practice guideline updates, and opinions were removed. Potentially relevant full-text articles were further assessed, and inclusion/exclusion criteria were applied. Inclusion criteria were: English language, quantitative research studies using prospective case-control, cross-sectional, or retrospective data analysis designs, and qualitative studies using interviews, observations, and
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focus groups. Exclusion criteria were: studies with only nursing students or advanced practice nurses as subjects, and studies conducted in psychiatric settings, outpatient settings, and other non-acute care settings. Figures 6, 7, 8, and 9 illustrate the search and screening process.

Search Outcome

A total of 43 articles meeting inclusion criteria were identified, including 11 articles related to nurse RRS activation, 12 articles related to team psychological safety, eight articles related to the personal sense of power, and 14 articles related to nurses’ willingness to activate the RRS. Two articles (Kitto et al., 2015; Martland, Chamberlain, Hutton, & Smigielski, 2016) were found to be relevant for both nurses RRS activation and nurses’ willingness to activate the RRS.

Critical Appraisal

The 43 articles were assessed for quality via a critical appraisal. Bowling’s (Bowling, 2014) recommendations guided the critical appraisal for the 27 quantitative studies (Appendix A). Pearson’s (Pearson, 2004) recommendations guided the critical appraisal for the 18 qualitative studies (Appendix B).

Data Extraction and Analysis

Data about research aim, design, sample, study locale, measurements, findings, limitations were extracted and reviewed (Appendices C, D, E, and F).

Data Abstraction and Synthesis

The integrative review includes empirical studies on the following: wholly compensatory nursing system, specifically nurse activation of the RRS; nursing agency, specifically nurses’ willingness to activate the RRS, and personal sense of power; and basic conditioning factors,
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specifically team psychological safety, as well as nurses’ age, gender, level of nursing education, years of practice as a registered nurse, and specialty certification status.

**Wholly Compensatory Nursing System: Nurse RRS Activation.** Review of the literature about nurse RRS activation revealed large heterogeneity across studies. Reported findings include: prevalence of nurse activations (n =3) (Boniatti et al., 2014; Lobos, Fernandes, Ramsay, & McNally, 2014; Psirides, Hill, & Jones, 2016), nurse activation triggers (n = 5) (Douw et al., 2015; Hart, Spiva, Dolly, Lang-Coleman, & Prince-Williams, 2016; Martland et al., 2016; Parker, 2014; Psirides et al., 2016), delayed/missed nurse activations (n = 2) (Boniatti et al., 2014; Odell, 2015), nurse interventions during delayed activations (n = 1) (Guinane, Bucknall, Currey, & Jones, 2013), and patient outcomes related to nurse RRS activations (n = 1) (Lobos et al., 2014).

Countries in which the studies were conducted were also heterogeneous. Study locations included Brazil (n = 1) (Boniatti et al., 2014), Australia (n = 3) (Guinane et al., 2013; Kitto et al., 2015; Martland et al., 2016), US (n = 3) (Hart et al., 2016; Parker, 2014; Stolldorf & Jones, 2015), Canada (n =1) (Lobos et al., 2014), New Zealand (n = 1) (Psirides et al., 2016), and the United Kingdom (n =1) (Odell, 2015). Even though all studies except one (Parker, 2014) were conducted at large teaching hospitals, the variety of countries with different health systems, as well as different nurse education systems and nurse practice standards contributes to the complexity involved in abstracting and synthesizing the findings. However, studies conducted outside of the US will also be included, because the nurse RRS activation criteria and process described are similar across countries.

*Prevalence of Nurse RRS Activations.* In two of the three studies that reported nurse RRS activation prevalence, nurses were found to activate the majority of RRS calls. Boniatti et al.
Nursing Agency and Nurse Rapid Response Activation (Boniatti et al., 2014) found that over an 18 month period, nurse activations accounted for 67% of 1148 RRS calls in a large teaching hospital. The rest were made by physicians. Psirides et al. (Psirides et al., 2016) also reported nurses activate a large majority (75.5%) out of 351 RRS calls over a three month study period across 11 hospitals. Only Lobos et al. (2014) found that nurses made 47.7% of 800 RRS calls, but still accounted for almost half of the activations; others were activated by physicians. These findings are consistent with previous reports indicating that nurses are the primary activators of the RRS (Adelstein et al., 2011; Bagshaw et al., 2010b; Marshall et al., 2011).

*Nurse RRS Activation Triggers*. Hospitals using RRS typically have official objective criteria, or triggers, as well as a subjective “general concern/staff worried” criteria, for activating the RRS (Johnston et al., 2015; Stolldorf & Jones, 2015). Objective criteria reported in the studies were based on physiological parameters, including abnormal heart rate, abnormal blood pressure, abnormal respiratory rate, low oxygen saturation, a decrease in Glasgow Coma Score, and prolonged seizures. (Boniatti et al., 2014; Guinane et al., 2013; Johnston et al., 2015; Lobos et al., 2014; Martland et al., 2016; Psirides et al., 2016). Nurses used the objective criteria more frequently than the subjective criteria as a trigger to activate the RRS. Two studies addressed nurses using physiological criteria as the trigger for activation. Psirides et al. (2016) and Martland et al. (2016) both found that a majority of nurse RRS activations were triggered by physiological criteria, 52.2%, and 68% respectively. The rest of the activations were triggered by the subjective criteria.

The subjective “general concern/staff worried” criteria is intended to be used when healthcare providers perceive the patient to be deteriorating, but the physiological signs are still within normal ranges (Boniatti et al., 2014; Guinane et al., 2013; Lobos et al., 2014; Martland et
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al., 2016; Psirides et al., 2016). Psirides et al. (Psirides et al., 2016) found that nurses used the subjective criteria in almost half the activations (47.8%). Martland et al. (2016) also found that nurses used this criteria in a minor, but still fairly significant (32%), the percentage of the activations. These findings may indicate that nurses rely on their subjective impressions to form judgments quite frequently.

Douw et al.’s (2015) systematic review found that when nurses were “worry” or “concerned,” they were noticing a plethora of subtle changes, including lethargy, not getting out of bed, slumping, agitation, unusual pain, clamminess, skin looking ashen or gray, not eating, as usual, vomiting, not acting the usual way, just doesn’t look well, feeling something is not right but can’t say what it is, and just a gut feeling something is wrong. Similarly, in their qualitative study, Hart et al. (2016) also found that nurses often noticed similar early, subtle signs of deterioration before there are recorded changes in vital signs. Nurses reported familiarity with the patient, and using one’s intuition, are key factors in being able to recognize these subtle changes (Hart et al., 2016).

While intuition was key in some cases, Parker (2014) found that different nurses used several different decision models for triggering RRS activations ($p = 0.003$). He found that in a sample of 87 medical/surgical nurses, those who used an intuitive model (8%) or relying on a gut feeling that something is wrong, activated the RRS an average of 2.3 times in a 12 month period. On the other hand, those who used an analytic decision model (21.8%), which refers to relying on gathering objective data and thinking of a hypothesis about what is wrong with the patient, activated most frequently. They averaged 4.7 activations in a 12 month period. Those who use a mixed model (70%) fall in the middle, averaging 2.56 activations in 12 months. Findings in this study are consistent with Martland et al.’s (2016) and Psirides et al.’s (2016) findings that while
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the subjective accounts for a significant portion of RRS activations, the objective criteria is used more frequently.

In addition to using the “general concern/worry” criteria for intuitive judgments, nurses also used the subjective criteria for situations unrelated to subtle patient changes. Martland et al.’s (2016) study found that nurses also used the subjective criteria in the following circumstances when there is uncertainty, or lack of trust in physician management, including the physician’s order is unclear, received incomplete handoff during ward transfer, undecided code status or advanced directives, felt the physician is not listening, disagree with junior physician’s plans, or lack confidence in the covering physician.

In summary, findings from the literature regarding triggers for nurse activation indicate considerably substantial heterogeneity in what triggers nurses to activate the RRS. This may result in some nurses reaching the trigger faster than others. The variety may contribute to delays in nurse RRS activation.

*Prevalence of Delayed/Missed Nurse Activations.* Literature investigating delayed/missed nurse RRS activation prevalence is limited. Only two studies reported delayed or missed RRS activations directly attributed to nurses. In their study, Boniatti (2014) operationally defined delayed activation as when RRS activation was not made within 30 minutes of the patient meeting at least one objective activation criteria. The researchers found that out of the total 771 nurse-initiated activations, a minority (17.6%) were delayed. On the other hand, out of 377 physician-initiated activations, 29.9% were delayed. Therefore, compared to physicians, nurses activated more frequently, but delayed activations were less frequent. Boniatti et al. (2014) only classified cases as delayed, and did not categorize any cases as missed.
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Only one study investigated missed nurse activations. Odell (2015) found that poor adherence to patient surveillance standards is a significant factor for missed activations. The researcher reviewed the patient records of 123 in-hospital cardiac arrest cases at a hospital in the United Kingdom. In 50% of the cases, nurses did not meet the minimum standard of monitoring heart rate, respiratory rate, blood pressure, oxygen saturation, temperature, and calculate the early warning score (EWS) at least once per shift. EWS is a composite score based on the patient’s vital signs used for assessing patient physiological status. Nurses were expected to assign the EWS, and activate the RRS if the patient exceeds the hospital-determined threshold. Odell (2015) found that even though the majority (n=103, 83%) of cases had a documented EWS, 45 (24%) scores were calculated incorrectly. 16 of the 45 cases were assigned a score below the activation threshold. However 15 of these cases should have been assigned an above activation threshold score. Therefore, 15 cases out of the 123 (12.2%) in-hospital cardiac arrest cases had a missed RRS activation related to incorrect EWS assigned by the nursing staff. Reasons for poor adherence were not explored in this study.

In summary, findings from the two studies reviewed indicate that currently, delayed or missed activations still occur at a fairly significant rate. The paucity of studies on delayed/missed nurse activations limits the extent of synthesis on this particular topic.

*Nurses’ Perceptions and Interventions During Delayed/Missed Activations.* Only two studies investigated what nursing activities or interventions took place, if any, during missed/delayed calls. Guinane et al. (2013) studied what nursing interventions took place instead of RRS activation. Out of 79 missed calls, 36 (46%) had at least one documented intervention, including administering or increasing supplemental oxygen, repositioning, obtaining 12-lead EKG, or in some cases, nurses only increased the assessment frequency. The abnormal vital
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signs resolved without further interventions in 81% of the cases. In 13 cases (36%), nurses contacted the covering physicians, and medications were ordered for 12 of the 13 patients with good outcomes. Reasons for nurses’ decisions to use alternative interventions instead of the RRS were not explored in this study.

Kitto et al.’s (2015) qualitative study explored nurses’ perceptions of using interventions instead of RRS activation. Sixty-two nurses from four hospitals participated, and some reported that not all “missed” calls are truly missed. They argued that in many cases, nurses still monitored and intervened, but they accessed support from colleagues to resolve the situation instead of activating the RRS. They felt that these patients still received appropriate care and were not neglected, just that the RRS was not needed in every case.

In summary, even though RRS activations may be missed or delayed regarding guideline adherence, nurses still provided care in a large percentage of missed calls. Studies focused on missed nurse activations are limited.

Patient Outcomes Related to Nurse RRS Activations. Only Lobos et al. (2014) reported patient outcomes directly attributed to nurse-initiated RRS activations. Out of 800 RRS activations, 381 (47.7%) were made by nurses. Compared to physician-initiated calls, nurse RRS initiated activations resulted in a proportionally lower rate of ICU admissions (25% vs. 15%, p = .001). However, factors that may explain the difference remains unexplored. Overall, there is a paucity of studies examining patient outcomes related to nurse RRS activation.

Measures of Nurse RRS Activation. No published instruments measuring nurse RRS activation were found. Studies measuring nurse RRS activations used four methods: retrospective patient record review (Boniatti et al., 2014; Guinane et al., 2013; Odell, 2015), retrospective hospital RRS activation data review (Boniatti et al., 2014; Guinane et al., 2013;
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Lobos et al., 2014; Psirides et al., 2016), point-prevalence observation (Shearer et al., 2012), and nurse self-report (Astroth, Woith, Jenkins, & Hesson-McInnis, 2017; Jackson, Penprase, & Grobbel, 2016b; Jenkins, Astroth, & Woith, 2015; Parker, 2014).

Nurse RRS Activation Using Orem’s Theoretical Framework. No studies focused on nurse RRS activation using Orem’s framework were found. An additional search was conducted on literature published before 2012, but no studies were found.

Nurse RRS Activation and Other Variables in This Study. No studies were found linking nurse RRS activation with other variables in this study: willingness to activate, personal sense of power, psychological safety, and nurse demographics.

In summary, literature examining nurse RRS activation is limited, with several gaps remaining. This study aims to fill some of the identified gaps related to nurse RRS activation.

Nursing Agency: Willingness to Activate the RRS. No studies were found to examine nurses’ willingness to activate the RRS as a distinct variable. Instead, studies were found to measure willingness as one variable in combination with a perceived barrier or a facilitator for activation. This review will address the reported findings accordingly. Reported findings in the literature related to nurse willingness to activate the RRS include nurse attitude towards RRS activation, barriers contributing to nurse unwillingness, and facilitators contributing to nurse willingness for activation.

Nurse Attitude Towards RRS Activation. A majority nurses recognized the RRS’ potential life-saving value. Thirteen out of 15 studies reported nurses viewed the RRS as a useful resource when patients deteriorate (Astroth, Woith, Stapleton, Degitz, & Jenkins, 2013; Astroth et al., 2017; Benin, Borgstrom, Jenq, Roumanis, & Horwitz, 2012; Braaten, 2015; Douglas et al., 2016; Jackson et al., 2016; Kitto et al., 2015; Leach & Mayo, 2013; Massey, Chaboyer, & Aitken,
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2014; Stolldorf, 2016). For example, Douglas et al. (2016) found that 92% of 434 nurses in a large Australian teaching hospital agreed that RRS activation allows clinicians to seek help for patients when help is needed. However, while most nurses found the RRS to be a helpful resource, some had negative attitudes towards activation. Some nurses viewed RRS activation indicates incompetence. Jackson (2016) found that 11.1% of 163 nurses believed activating the RRS indicates the nurse did not provide adequate care, therefore leading to deterioration. Similarly, Jenkins et al. (2015) reported 12% of nurses agreed that RRS activation indicates an inability to care for one’s patients, and 14% felt neutral or uncertain. Shearer et al. (2012) found that 41% of 83 nurses felt they should be able to handle deteriorating patients on one’s own. However, reasons for holding these beliefs are unknown.

No studies were found to explore reasons behind beliefs that activation indicates incompetence, but three studies investigated the relationship between nursing experience and attitude towards activation. Astroth et al. (2017) and Jenkins et al. (2015) both found that nurses’ years of experience positively correlated with attitude towards the RRS ($r = .13, p = 0.01$, and $r = .45, p = .01$, respectively). Similarly, Jackson et al. (2016) found that years of experience is negatively correlated with reluctance to activate due to perceived barriers ($ρ_{161} = -0.250$). Authors of these studies posited that this correlation might be attributed to seasoned nurses were more certain of their knowledge and therefore feel less intimidated by RRT members (Astroth et al., 2017), and less experienced nurses may not fully understand the seriousness of situations and therefore do not appreciate the assistance that the RRS provides (Jackson et al., 2016b).

While these studies found correlations between experience and attitude, the level of nursing education was not found to correlate with attitude. Only two studies investigated this
Nursing Agency and Nurse Rapid Response Activation relationship. Both Astroth et al. (2017) and Jenkins et al. (2015) did not find significant correlations in their studies.

In summary, even though the majority of nurses view the RRS as a useful resource, a small but significant minority of nurses hold negative attitudes towards RRS activation. Those with negative attitudes may contribute to barriers for others to activate.

**Barriers contributing to Nurse Unwillingness.** Multiple studies investigated what factors contributed to nurse unwillingness to activate the RRS. The major factors are found to be: fear of criticism from nursing colleagues, fear of criticism from physicians, and previous negative interaction with the rapid response team (RRT).

All studies included in this review identified fear of criticism from nursing colleagues as a barrier. In all of the eight qualitative studies reviewed, nurses reported they feared to look stupid for making the wrong call, feared being seen as over-reacting, feared being viewed as incompetent or unable to handle challenging situations; nurse also reported receiving reprimand and hostility from colleagues for activating (Benin et al., 2012; Braaten, 2015; Kitto et al., 2015; Linda Searle Leach & Mayo, 2013; Marshall et al., 2011; Martland et al., 2016; Massey et al., 2014; Stolldorf, 2016). The quantitative studies had similar findings. For example, Jackson (2016) found that one-third (29.4%) of 163 nurse are reluctant to activate the RRS due to fear of making the wrong call, and 13.7% agreed or are uncertain that they are reluctant to activate because they will appear incompetent to other colleagues. Similarly, Douglas et al. (2016) found 17.1% of 434 nurses feared criticism if they made a wrong call. Shearer et al. (2012) found 51.8% of 83 nurses did not feel colleagues would support their decisions to activate, and a small but significant number (11.1%) feared negative or hostile reactions from colleagues.
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A large minority of nurses reported being unwilling to activate when they were unsure about whether the patient is truly deteriorating. Jackson (2016) reported 10.1% ($p < .01$) of nurses are reluctant to activate if the vital signs meet activation criteria but the patient does not look unwell. 25% were uncertain whether they would activate or not. In the same study, only 8.1% of nurses reported they would activate if they are worried but the patient did not meet criteria, and 29.1% are uncertain. Douglas et al. (2016) included similar items in their study. They found 20% ($p < .01$) of nurses were reluctant to activate if the vital signs meet activation criteria but the patient does not look unwell, and 55.8% ($p < .01$) reported they would not activate if they are worried, but the patient did not meet criteria. These findings may indicate that when nurses felt unsure about whether their patients are truly deteriorating, a significant number (8.1-55.8%) of nurses were sufficiently afraid of the potential repercussions that they were unwilling to take the risk to activate, and up to one-third were unsure what to do, despite their own “gut-feeling” indicate they should be worried.

In addition to the fear of criticism from colleagues, physician criticism is also a barrier. Eight of the included studies found that nurses feared physician disapproval. Nurses feared to make physicians feel undermined by activating (Astroth et al., 2013; Benin et al., 2012; Braaten, 2015). They felt a need to apologize to the covering physician for activating even though it was indicated (Benin et al., 2012), and reported they would not activate without calling the covering physician first (Douglas et al., 2016; Jackson et al., 2016b). Studies involving both nurses and physicians corroborated that physicians also felt undermined when nurses activated the RRS (Benin et al., 2012), they felt nurses usually over-activated (Douglas et al., 2016; Kitto et al., 2015). Five studies found that physicians actively discouraged nurses from activating even when it was indicated (Benin et al., 2012; Douglas et al., 2016; Leach & Mayo, 2013; Martland et al.,...
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2016; Shearer et al., 2012). Authors from these studies posited that traditional hierarchy played a significant role in this barrier (Benin et al., 2012; Douglas et al., 2016; Shearer et al., 2012).

Previous negative experience with the RRT is also a significant factor. Multiple studies examined nurses’ negative interactions with RRT members. While no studies investigated the prevalence of negative interactions, many studies explored the characteristics of the interactions. Five qualitative studies found negative experiences include the following: being criticized for making an unnecessary call (Astroth et al., 2013; Leach & Mayo, 2013; Shearer et al., 2012), perceived condescension, demeaning remarks, negative attitude, hostility, and complaints about being busy in the ICU (Astroth et al., 2013; Leach & Mayo, 2013; Shearer et al., 2012), not listening to the activating nurse (Braaten, 2015), being pressured to justify activating in front of the patient (Douglas et al., 2016) and being generally scared of RRT members (Kitto et al., 2015; Shearer et al., 2012). Even just a single negative experience was enough of a deterrent to avoid future activations (Astroth et al., 2013).

Only two quantitative studies examined the nature of negative experiences with the RRT. Jenkin et al. (2015) found that 16% of 50 nurses expected RRT members would criticize nurses for making unnecessary calls, 22% were uncertain. Additionally, 12% expected RRT members to be condescending, and 14% expected the members to make complaining comments during the call. Astroth et al. (2017) did not find significant correlations between perceived negative RRT experiences and nurses’ level of education or years of experience.

In summary, barriers contributing to nurses’ unwillingness to activate the RRS are explored in multiple studies. The findings suggest that nurses’ fear of criticism from colleagues, physicians, and from the RRT to be significant barriers to nurse RRS activation. Even though the
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Sample sizes of the included studies are small (range 12 - 434 nurses), the heterogeneity of the findings related to barriers is also relatively small.

Facilitators Contributing to Nurse Willingness: Studies exploring facilitators contributing to nurses’ willingness to activate the RRS mostly overlapped with studies focused on barriers. However, findings on facilitators are more heterogeneous. Facilitators were found to include: supportive organization culture (Leach & Mayo, 2013), supportive unit culture (Astroth et al., 2013; Jenkins et al., 2015), supportive charge nurse (Astroth et al., 2013; Braaten, 2015; Jenkins et al., 2015; Massey et al., 2014), previous positive interactions with the RRT (Astroth et al., 2013; Benin et al., 2012; Braaten, 2015; Leach & Mayo, 2013; Stolldorf, 2016), and education/knowledge about the RRS process (Astroth et al., 2013; Astroth et al., 2017; Jenkins et al., 2015; Leach & Mayo, 2013; Pantazopoulos et al., 2012). Physician supportiveness was not identified as a facilitator.

Leach & Mayo’s (2013) qualitative study identified organization culture that emphasizes patient safety, as well as teaching and learning, as a facilitator. Nurses felt comfortable activating the RRS when the organization culture values quality care and collegial relationships in which staff frequently teach and learn from each other.

Supportive unit culture is found to be a facilitator in three studies. Astroth et al.’s (2013) qualitative study found that nurses from three medical/surgical units in a U.S. hospital reported that listening to each other’s concerns was part of their unit culture. They felt comfortable activating when they know their colleagues will support their decision to call and will help cover other patients while the activating nurse cares for the deteriorating patient. Findings from Jenkins et al’s (2015) quantitative study is consistent with the qualitative study findings. 92% of 50 nurses reported that unit culture that encourages calling the RRT facilitates activation. Astroth et
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al. (2017) used the same set of questions as Jenkins et al.’s (2015) study with a larger sample (n = 202) and found that supportive unit culture is negatively correlated with perceiving negative experience with the RRT as a barrier ($r = -.258, p < .001$). That is, nurses working in supportive units are less likely to view negative interactions with the RRT as a barrier to activation.

The supportive charge nurse is identified to be another facilitator. Astroth et al. (2013) found that when charge nurses support nurses’ judgment and patient care decisions, nurses felt confident to activate. Similarly, Jenkins et al. (2015) also found nurses agreed (92%) that charge nurses that support RRS activation are a facilitator. Massey et al. (2014) and Braaten et al. (2015) both also found this in their qualitative studies as well, particularly when the activating nurse is relatively inexperienced.

Previous positive experience with the RRT is identified as a facilitator. Several studies explored characteristics of positive experiences, and they include: RRT members took the time to explain and teach (Benin et al., 2012; Linda Searle Leach & Mayo, 2013; Stolldorf, 2016), members listened to the activating nurse (Astroth et al., 2013; Stolldorf, 2016), and used clear communication (Astroth et al., 2013; Linda Searle Leach & Mayo, 2013; Stolldorf, 2016). Consistent with these studies, Jenkins’ et al. (2015) found that nurses agree that knowing RRT members will treat nurse with respect, as well as support the nurses’ decision to call, (72% and 76% respectively) facilitate their activation. One study also found nurses felt more comfortable activating if the RRT is led by a nurse instead of a physician (Leach & Mayo, 2013).

Finally, knowledge is identified as a facilitator, including knowledge about the RRS process (Astroth et al., 2013; K. S. Astroth et al., 2017; Braaten, 2015; Leach & Mayo, 2013), and knowledge about managing deteriorating patients (Pantazopoulos et al., 2012). Nurses felt if they have more knowledge about the RRS process, they will be more likely to activate it.
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(Astroth et al., 2013; Braaten, 2015; Leach & Mayo, 2013). Nurses felt they need knowledge about: policies for activation, understanding the RRT team structure, how to communicate with the RRT effectively, and who is responsible for bringing equipment (Astroth et al., 2013; Leach & Mayo, 2013). Additionally, in a quantitative study, Astroth et al. (2017) found that feeling knowledgeable about the RRS process is positively correlated with perceived positive interactions with the RRT ($r = .265$, $p < .001$). That is, nurses who perceive themselves to be knowledgeable about the RRS process are more likely to perceive positive experiences with the RRT.

One study explored nurses’ knowledge about managing deteriorating patients, particularly knowledge on which patient conditions warrant activation. Pantazopoulos et al. (2012) measured 94 nurses’ patient management knowledge in Greece via an 11-item quiz. Nurses were asked to identify patient deterioration situations, identify nursing interventions, and indicate whether RRS activation is warranted. They found that nurses who scored higher on items related to identifying deterioration also scored higher on RRS activate items ($p < .05$). They also found that compared to nurses who graduated from a 2-year program, those graduated from a 4-year program scored higher on the knowledge items, and were more likely to respond correctly to the RRS activation items ($p < 0.005$). However, this study focused solely on nurses’ knowledge but did not include questions on other factors that may influence whether nurses will actually apply their knowledge in real situations.

Several gaps remain in the body of literature investigating facilitators that contribute to nurse willingness. In summary, support from colleagues, nurse leaders, and RRT members, as well as knowledge are key facilitators that contribute to nurse willingness for RRS activation.
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However, compared to studies focusing on barriers, fewer studies were found to investigate facilitators.

*Interventions Affecting Nurse Willingness.* Studies found were all descriptive, or descriptive correlational, no experimental or quasi-experimental studies were found focused on interventions affecting nurses’ willingness to activate the RRS.

*Measures of Nurse Willingness to Activate the RRS.* At the time of this search, no published instrument measuring nurses’ willingness to activate the RRS with well-established psychometric properties was found. One instrument, the 17-item Survey of Nurses’ Attitudes to the Medical Emergency Team (Jones et al., 2006b), was found to contain items measuring nurses’ willingness to activate. However, the authors only reported establishing face validity via focus group review, but did not conduct further testing to establish other relevant psychometric properties. This instrument was modified and used by two studies included in this review (Douglas et al., 2016; Jackson et al., 2016b), with relatively small sample sizes in the U.S. (n = 434 and 163, respectively). The authors also did not report psychometrics testing of this instrument in their studies. This instrument will be further discussed in Chapter 3.

One other instrument was found to measure nurses’ perceptions of barriers and facilitators to the RRS, but it did not contain items measuring nurse’ willingness to activate (Astroth et al., 2017; Jenkins et al., 2015).

*Nurse Willingness to Activate the RRS Using Orem’s Theoretical Framework.* No studies focused on nurses’ willingness to activate the RRS using Orem’s framework were found. An additional search was conducted on literature published before 2012, but no studies were found.

In summary, gaps remain in the literature studying nurses’ willingness to activate the RRS. This study aims to fill some of the identified gaps related to nurse RRS activation.
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**Nursing Agency: Personal Sense of Power.** A search of the literature found no studies on nurses’ personal sense of power. The lack of studies is not completely unexpected, as Anderson et al. (2012) first proposed the concept of personal sense of power and studied it as a variable relatively recently in 2012. However, one study was found investigating healthcare workers’ personal sense of power in a large multi-specialty medical practice setting. This section will discuss findings from this study, and also briefly summarize findings from studies on a personal sense of power outside of healthcare.

Morrison, See & Pan (2015) studied the relationship between healthcare employee’s personal sense of power, employee silence, and target openness. Employee silence refers to whether employees speak up or stay silent about important issues. Target openness refers to whether the “targets” of speaking up, in this study physicians in practice, are perceived to be open to suggestions. The researchers surveyed 207 employees in this medical group, including nurses, medical assistants, physician therapists, x-ray technicians, and receptionists.

While the authors did not report findings specific to nurses, they reported profession was not significantly correlated with a personal sense of power or silence. They found that personal sense of power is negatively correlated with silence ($r = -.16, p < .05; \beta = -.15, SE = .05, p = .046$). That is, those with a low personal sense of power are more likely to remain silent about important issues. They also found that when target openness is a standard deviation or more below the mean, the negative relationship between personal sense of power and silence remains strong ($\beta = -.29, SE = .07, p < .001$). However, when target openness is one standard deviation or more above the mean, the relationship becomes insignificant ($\beta = .06, SE = .07, p = .35$), suggesting that target openness may mediate the relationship between personal sense of power and silence.
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Even though nurse-specific results were not reported, findings from this study may still provide relevant support to this proposed study, as nurses activating the RRS may be analogous to speaking up to signal something is not right with the patient. Missed or delayed activations may be analogous to remaining silent. Physician criticism, an identified barrier to nurse RRS activation, may be analogous to physicians having low openness. This study found that when physician openness is low, employees with low personal sense of power remain silent. However, when physician openness is high, low employee personal sense of power does not necessarily predict silence. This finding may help point to a gap in the literature regarding facilitators that contribute to nurse willingness to activate. Physician support, which may be analogous to high openness, has not been identified as a facilitator for nurse RRS activation. Further studies may be needed to explore physician support as a variable.

*Studies about Personal Sense of Power in Non-Healthcare Settings.* Findings from the studies conducted in non-healthcare settings will be briefly summarized in this section to provide a broader context of how this variable was studied outside of healthcare. Seven studies were found to study the personal sense of power in university, work organizations, and general public settings. This discussion will focus on the significant findings.

Findings from reviewing the literature suggest that individuals’ level personal sense of power is relationship specific, differing across peers, friends, significant others, supervisor, or parental relationships, but remains relatively consistent (Anderson, John, et al., 2012). No significant difference was found between genders (Anderson, John et al., 2012). A personal sense of power was found to positively correlate with a multitude of personal traits, including leadership, narcissism, assertiveness, extraversion, conscientiousness, self-esteem, openness to new experiences (Anderson, John, et al., 2012), and self-control (Kim, Lee, & Rua, 2015).
A personal sense of power was found to negatively correlate with two personal traits: Machiavellianism (or manipulativeness) and neuroticism (Anderson, John et al., 2012). Sociometric status, or how much an individual is liked and respected by peers (Anderson, John et al., 2012; Anderson, Kraus, Galinsky, & Keltner, 2012), is found to predict personal sense of power. Personal sense of power is also found to mediate the relationship between sociometric status and subjective well-being (Anderson, Kraus, et al., 2012). It is also found to mediate between having objective power and overconfidence (Fast, Sivanathan, Mayer, & Galinsky, 2012).

Additionally, personal sense of power is found to affect the perception of objects in one’s environment, as well as one’s intention to perform a behavior. For example, Lee & Schnall (2014) found that personal sense of power negatively correlated with the perceived weight of boxes in front of study participants. Choi & Mattila (2014) found that personal sense of power predicted consumer’s intent to purchase during a sale. Joshi & Fast (2013) found that personal sense of power predicted intent to save money.

**Measures of Personal Sense of Power.** Currently, only one instrument is found to measure personal sense of power. Anderson et al. (Anderson, John, et al., 2012) published the Personal Sense of Power Scale in their seminal study on personal sense of power. It was used in all eight of the studies reviewed. Development, survey items, and psychometric properties of this instrument are discussed further in Chapter 3.

In summary, personal sense of power is minimally examined in healthcare settings. To date, findings specific to nurses has not been reported.

**Basic Conditioning Factors: Team Psychological Safety.** A search of the literature found only four studies conducted exclusively with nurses as participants (Lee, Yang, & Chen,
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2016; Leroy et al., 2012; Ortega, Sanchez-Manzanares, Gil, & Rico, 2013; Ortega, Van den Bossche, Sánchez-manzanares, Rico, & Gil, 2014). Eight other studies found were conducted with both nursing and non-nursing participants. However, all will be addressed in this review, because in this proposed study, team psychological safety is considered a potential basic conditioning factor in the healthcare environment external to the nurse, and both nurses and non-nurses all may contribute to the environment. This review will include six quantitative studies, four qualitative studies, and two mixed method studies.

Edmondson (1999) first proposed the concept of team psychological safety in her multiphase, mixed-methods landmark study. The purpose of her study was to determine the mechanisms of knowledge creation and retention in work teams within organizations. The team psychological safety scale was developed as part of her study. Since its’ development, the scale has been used in multiple studies in both healthcare and non-healthcare settings (Edmondson & Lei, 2014). In this review, four of the six quantitative studies used the full instrument (Leroy et al., 2012; Ortega et al., 2013, 2014; Schwappach & Gehring, 2015) Three quantitative studies (Lee et al., 2016; Schwappach & Gehring, 2015; Yanchus, Periard, Moore, Carle, & Osatuke, 2015), and one mixed method study (Derickson, Fishman, Osatuke, Teclaw, & Ramsel, 2015) used select items from the instrument.

**Team Psychological Safety as a Predictor of Team Learning Behavior.** Four studies, including Edmondson’s (1999), found that team psychological safety is a predictor of team learning behaviors. Team learning behaviors refer to team member behaviors that enable learning and ways to improve, including speaking up when issues arise, admitting errors, experimenting, admitting weakness, asking for help, seeking input and feedback, and engaging in reflection (Edmondson, 1999). Edmondson (1999) found that psychological safety is a predictor
of team learning behaviors (self-report: $\beta = .76, p < .01$; observer rating: $\beta = .46, p < .01$). She studied 496 employees in 51 work teams in an office furniture design and manufacturing company and found that when team members in psychologically safe teams engaged in team learning behaviors more frequently. For example, they spoke up more, they asked for help from each other more, they also asked for feedback from each other and customers more frequently.

Even though Edmondson’s (1999) study was not conducted in a healthcare setting, findings from this seminal study may still provide relevant support to this proposed study. Nurses activating the RRS may be analogous to speaking up about concerns and seeking help when patients deteriorate, which is a key characteristic of team learning behaviors. Therefore, psychological safety may be a potential factor affecting nurse RRS activation.

Edmondson (Edmondson, 2003) also was first to conduct research on psychological safety in a healthcare setting. She observed and interviewed nurses, perfusionists, cardiac surgeons, and anesthesiologists in 16 cardiac surgery teams across 16 hospitals. She conducted the study during periods when the surgical teams were implementing minimally invasive cardiac surgery, which was then a new surgical technique. Similar to her initial study, she found that psychological safety is a key factor for team members feeling comfortable to exhibit team learning behaviors, including asking questions when uncertainty arose and speaking up about concerns. When problems arose, coaching and support from team leaders, in this case, the cardiac surgeons, were in turn key factors in fostering psychological safety in the surgical teams.

Ortega et al.’s (2013) study had similar findings. The researchers surveyed 468 nurses in 89 nursing teams and found that team psychological safety is positively correlated with team learning behaviors ($r = .50, p < .01$). Additionally, team learning behaviors mediated the positive relationship between team psychological safety and rater-observed team performance ($\beta = .26, p$
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= < .05). In a different study, Ortega et al. (2014) studied 689 nurses in 107 nursing teams, and found sequential mediating effects among change-oriented leadership, which refers to leadership being open and supportive of change, team psychological safety ($\beta = .52$, $p < .01$), team learning behavior ($\beta = .57$, $p < .01$), and team performance ($\beta = .32$, $p < .01$).

Yanchus et al.’s (Yanchus, Derickson, C. Moore, Bologna, & Osatuke, 2014) qualitative study also found that team psychological safety is an antecedent of team learning behaviors. The researchers interviewed 390 employees from 15 Veterans Health System hospitals. Nine of the hospitals were previously found to have a high level of team psychological safety from a previous dataset, and six found to have a low level of team psychological safety. The researcher did not report findings specific to nurses but referred to staff in general. Staff in low psychological safety hospitals reported infrequent team learning behaviors. For example, they felt supervisors were closed off to staff input, provided infrequent feedback, and left employees to fend for themselves. They also reported feeling uncomfortable speaking up in general, as they feared retaliation and ridicule from supervisors and co-workers. On the other hand, staff from high psychological safety hospitals reported opposite experiences. Employees reported comfortable speaking up about concerns, felt supervisors welcomed their input and felt their colleagues listened to each other.

Similarly, Wakeam, Hyder, Ashley, & Weissman (2014) conducted 106 interviews with healthcare providers across seven hospitals with various team psychological safety levels. Participants also reported team psychological safety is a key factor for feeling comfortable speaking up about patient care concerns. They felt that when they felt safe enough to speak up, they could be more effective in rescuing deteriorating patients.
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In summary, multiple studies revealed that team psychological safety is a predictor of team learning behaviors, particularly speaking up about concerns. Team learning behavior is found to in turn mediate between team psychological safety and team performance. Findings amongst the reviewed studies are fairly consistent

*Team Psychological Safety as a Mediator or Moderator Variable in Error Reporting.*

Five studies examined team psychological safety as a mediator or moderator of error reporting, which may be considered a type of team learning behavior. Two studies examined the effect of team psychological safety on nurses’ error reporting. Lee et al. (2016) surveyed 649 nurses across 40 hospitals on their intent to report errors, and found that team psychological safety has a significant positive effect on nurses’ intent to report errors in which the nurse was involved (β = 0.31, p < .001) and errors observed but not directly involved (β = 0.18, p < .001), perceived subjective norms of error reporting (β = 0.18, p < .001), and perceived benefit of error reporting (β = 0.35, p < .001).

Leroy et al.’s (2012) study had similar findings. The researchers surveyed 580 nurses across four hospitals to examine the relationship between team psychological safety, perceived leader behavior integrity towards safety, team priority of safety, and frequency of error reporting in hospitals. Perceived leader behavioral integrity refers to whether leaders, in this case nurse leaders in the hospitals, actually “practice what they preach” regarding patient safety practices. Team priority of safety refers to a team climate of emphasizing strict protocol adherence, which may inhibit error reporting. The researchers found that psychological safety is a strong predictor of error reporting (β = 0.28, p = .02). That is, when team members feel psychologically safe, they are more willing to report errors honestly. They also found that team psychological safety moderated between team priority of safety and error reporting frequency (β = -.35, p = .01).
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is, even though a strict climate of protocol adherence may inhibit error reporting if psychological safety is present in the team, members are still willing to report errors. Additionally, they found that the effect of leader behavior integrity on error reporting is mediated through a combination of team priority of safety ($\beta = -.13, p < .01$) and team psychological safety ($\beta = .12, p < .01$).

Two studies were conducted with both nurse and non-nurse healthcare providers. Both found that team psychological safety is significantly associated with error reporting. Schwappach & Gehing (2015) studied predictors of keeping silent about patient safety concerns among 1013 healthcare providers across eight hospitals. Nurses (n = 780, 79%), physicians (n = 131, 13%), and other allied health professionals (n = 71, 7%) participated. Researchers found that compared to physicians, nurses were more likely to remain silent about patient safety concerns ($R = .308$, $R^2 = .331, p < .001$). They also found that high level of team psychological safety significantly decreased the frequency of keeping silence ($R = -0.162, R^2 = 0.331, p < .001$).

Derickson et al. (2015) surveyed and interviewed healthcare providers across 152 hospitals in the U.S. Veteran Health System in their large mixed-methods study (n = 185,879). They found that within the health system, perceived levels of team psychological safety is heterogeneous among hospitals. Employees in hospitals with high psychological safety were more likely to indicate they would report errors (91% vs 71%), and less likely to indicated they would not report errors (0% vs. 13%).

Similarly, Yanchus et al.'s (2014) qualitative study also found that employees in high psychological safety hospitals felt comfortable reporting errors, and felt confident that their concerns were taken seriously. On the other hand, employees in low psychological safety hospitals reported feeling uncomfortable reporting errors. They felt management will not take
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actions to remedy the situation, feared retaliation, and felt there will not be any whistleblower
protection.

In summary, review of the literature revealed consistent evidence suggesting that team
psychological safety predicts team learning behaviors, and has a positive effect on error
reporting. However, there is a paucity of data focused on nurses’ perception of team
psychological safety. This proposed study aims to fill some of that gaps related to this area.

*Team Psychological Safety Association with Other Variables.* Several studies examined
team psychological safety’s association with other variables, including, power sharing, patient
outcomes, and turnover intention. O’Leary’s (2016) qualitative study found that when in
psychologically safe teams, members felt more comfortable sharing decision making,
volunteering for responsibility, and assigning responsibility to others. They also developed better
understandings of each other’s roles and responsibilities across professions. Additionally,
participants reported that team membership stability is a key factor to fostering psychological
safety. Similarly, Wakeam et al.’s (2014) qualitative study also reported team membership
continuity is a key factor in fostering psychological safety. They felt month-to-month resident
rotations led to unfamiliarity among team members and inhibited the development of team
psychological safety.

Lastly, Yanchus et al. (2015) found that team psychological safety is a predictor of
healthcare providers’ low intention to turnover (n = 11726, \( \beta = -.19, p < .01 \)). That is, when
employees feel psychologically safe, they are less likely to have the intent to leave their jobs.
This study in the only one found to link team psychological safety with employee intention to
stay or leave their place employment.
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**Measures of Team Psychological Safety.** Currently, only the Team Psychological Safety Scale (Edmondson, 1999) is found to measure team psychological safety. It was used in multiple studies included in this review. Development and psychometric properties of this instrument will be further discussed in Chapter 3.

**Team Psychological Safety Using Orem’s Framework.** Currently, no studies were found to examine team psychological safety using Orem’s (2001) framework. An additional search was conducted on literature published before 2012, but no studies were found. This proposed study may contribute to filling some of the gaps in the literature.

**Summary**

In summary, this chapter reviewed relevant current literature about nurse RRS activation, nurses’ willingness to activate the RRS, personal sense of power, and team psychological safety. Synthesis of the literature revealed several gaps. For example, findings from literature about nurse RRS activation remain heterogeneous, and there is a paucity of studies focused exclusively on the frequency and outcomes of nurse RRS activation. Studies on missed nurse RRS activations were also not well represented. On the other hand, while barriers and facilitators of nurse RRS activation were well studied, and fear of criticism was consistently found to be the main barrier, nurses’ willingness to activate the RRS has not been studied as an individual variable.

Overall, as a recently proposed concept, personal sense of power has not been well studied in the literature. While nurses were part of a study found to examine healthcare providers’ personal sense of power, findings specific to nurses’ personal sense of power has not been reported. Team psychological safety has been well studied in the literature, and findings consistently showed that team psychological safety is a predictor of team learning behavior,
Nursing Agency and Nurse Rapid Response Activation including speaking up, as well as reporting errors. However, there is a paucity of studies focused on examining nurses’ perception of team psychological safety. Additionally, No studies were found to use Orem’s (2001) framework to examine relationships between nurse RRS activation, nurse willingness to activate the RRS, personal sense of power, and psychological safety.

This chapter addressed the findings and the gaps in the literature supporting this proposed study. Chapter 3 will address the methods.
Chapter 3: Methods

This chapter presents the research method used to investigate the relationships between team psychological safety, personal sense of power, and nurse rapid response system (RRS) activation. It also tested the concepts in the Self-Care Deficit Nursing Theory (SCDNT) in the specific context of nurse RRS activation (Silva & Sorrell, 1992): nursing agency foundational disposition, nursing agency power component, basic conditioning factors, and wholly compensatory nursing system. This chapter includes a discussion of the research design, the sample, and the instruments. Data collection procedures and data analysis method are presented as well.

Design

A cross-sectional study was conducted to investigate the relationships between team psychological safety, personal sense of power, and nurse RRS activation, as well as test the following concepts in the SCDNT in the specific context of nurse RRS activation: nursing agency foundational disposition, nursing agency power component, basic conditioning factors, wholly compensatory nursing system. According to Polit and Beck (2008), cross-sectional design is suitable for this study that describes relationships among the above phenomena at a fixed point in time.

The study was performed in two large urban academic medical centers: (1). A 718-bed urban academic hospital, and (2). A 450-bed urban academic hospital, both sites belonging to the same health system.

Population and Sample
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**Population.** The target population for this study was registered nurses caring for hospitalized patients. Purposive sampling was used to recruit a representative sample from this population to participate in this study.

**Sample size.** A priori power analysis was conducted to calculate the minimum sample size using G*power 3.1.9.2 (Faul, Erdfelder, Lang, & Buchner, 2007). A minimum of 109 participants was needed to achieve an alpha = .05, power = 0.8, and effect size = 0.15 (Cohen, 2013).

**Instruments**

Table 1 provides a summary of the concepts, study variables, and the empirical measures.

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<tr>
<th>Concept</th>
<th>Study Variable</th>
<th>Empirical Measures</th>
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<tr>
<td>External Basic Conditioning Factors</td>
<td>Team Psychological Safety</td>
<td>Team Psychological Safety Scale</td>
</tr>
<tr>
<td>Internal Basic Conditioning Factors</td>
<td>Nurses’: age, gender, level of nursing education, years of practice as a registered nurse, specialty certification, Advanced Cardiac Life Support (ACLS) certification</td>
<td>Participant’s self-report in demographics questionnaire</td>
</tr>
<tr>
<td>Nursing Agency Foundational Disposition</td>
<td>Nurses’ personal sense of power</td>
<td>Personal Sense of Power Scale</td>
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<td>Nursing Agency Power Component</td>
<td>Nurses’ willingness to activate the RRS</td>
<td>Survey of Nurses’ Attitudes to the Medical Emergency Team (Modified)</td>
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<td>Wholly Compensatory Nursing System</td>
<td>Nurse activation of the RRS</td>
<td>Nurse self-report of RRS activation within the past 12 months</td>
</tr>
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</table>

*Table 1. Concepts, study variables, and empirical measures*

**Measure of External Basic Conditioning Factor: Team learning behaviors and**

**Team Psychological Safety Survey – Team Psychological Safety Scale.** The level of nurses’ perception of team psychological safety was measured using the Team Psychological Safety Scale (TPSS) developed by Edmondson (1999) (Appendix A). She defined team psychological safety as “the shared belief held by members of a team that the team is safe for interpersonal risk
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taking” (Edmondson, 1999). Edmondson (1999) developed the measures for team psychological safety and team learning behaviors in her landmark study, building on earlier well-known studies focused on individual psychological safety and organizational learning (Kahn, 1990; Klimoski & Mohammed, 1994; Mayer, Davis, & Schoorman, 1995; Robinson, 1996; Schein & Bennis, 1965; Tyler & Lind, 1992). In this study, only the TPSS was used.

In this study, the 7-item TPSS (Edmondson, 1999) measured nurses’ perception of team psychological safety level within the inter-professional healthcare teams to which they belong. Respondents were asked to rate the items on a 7-point Likert-type scale, ranging from 1 (very inaccurate) to 7 (very accurate). Sample items in this subscale include: “It is safe to take a risk on this team,” and “If you make a mistake on this team, it is often held against you” (reverse scored). Higher scores on the TPSS indicate the respondent perceives a higher level of team psychological safety.

Validity. Edmondson (1999) conducted extensive preliminary qualitative research to establish content validity. She observed and interviewed members (n = 472) from 51 work teams in an organization that manufactured office furniture, and developed the team psychological safety and team learning behavior scales based on the qualitative data. Edmondson (1999) performed factor analysis to determine discriminant validity. The items from each scale loaded onto two factors, with factors loadings of .40 or above, and eigenvalues of above 1.0. All the items were retained in the planned subscales.

Edmondson (1999) further assessed the validity of team psychological safety and team learning behavior as team-level constructs. To establish validity at the team-level, assessments from individuals in each team must converge, such that the intraclass correlation coefficient (ICC) is greater than zero (Kenny & La Voie, 1985). Edmonson’s (1999) analyses found team
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psychological safety \((F = 6.98, p < .001, r_{ICC} = .39)\) and team learning behavior \((F = 5.79, p < .001, r_{ICC} = .27)\) met the validity criteria for team-level constructs.

**Reliability.** Edmondson (1999) demonstrated internal consistency (Nunnally, 1978) for the TPSS \((\alpha = .82, p < .05)\) and the team learning behavior scale \((\alpha = .78, p < .05)\). Other researchers further tested the internal consistency of the TPSS \((\alpha's = .76 – .82)\) (Carmeli & Gittell, 2009; Carmeli, Reiter-Palmon, & Ziv, 2010; Dowley, 2006; Dufresne, 2007; Dunne, 2013; Knapp, 2016; Kostopoulos & Bozionelos, 2011; Siemsen, Roth, Balasubramanian, & Anand, 2008; Yoon, 2014). The conceptual fit of the TPSS, plus its brevity, reliability and validity, make it well suited to the purposes of this proposed study.

**Measure of Foundational Disposition of Nursing Agency: Personal Sense of Power Scale (PSPS).** The level of nurses’ personal sense of power was measured by the Personal Sense of Power Scale (PSPS), developed by Anderson, John, & Keltner (2012). (Appendix B) The 8-item scale was developed to measure individuals’ beliefs about their ability to influence other people’s behaviors and opinions. They assessed individuals’ personal sense of power in the context of one-on-one relationships (i.e. with a friend, a parent, or a stranger), as well as in the context of the individual’s relationship with a group (i.e. with a group of peers). Anderson et al. (2012) developed the scale based on previous research on power dynamics in interpersonal relationships (Bugental, Blue, & Cruzcosa, 1989; Galinsky, Gruenfeld, & Magee, 2003; Keltner et al., 2003). Currently, this instrument has not been used in healthcare settings.

In this study, the PSPS (Anderson, John, et al., 2012) measured nurses’ perception of their ability to influence their co-workers. Respondents were asked to rate the items on a 7-point Likert-type scale (1 = Strongly disagree, 7 = Strongly agree). Sample items included: “In my relationship with my co-workers, I can get them to listen to what I say,” and “Even if I voice
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them, my views have little sway with my co-workers” (reverse scored). High score on this scale indicates a high personal sense of power.

**Validity.** Anderson et al. (2012) conducted extensive review of relevant literature to establish content validity (Cameron Anderson, John, et al., 2012; Keltner et al., 2003). They conducted 5 pilots studies with undergraduate and MBA students in U.S. universities (n₁= 68, n₂ = 145, n₃=122, n₄=62, n₅ = 744). They demonstrated convergent validity via correlations with related psychological constructs, including: narcissism (r = .46, p < .01); extraversion (r = .49, p < .01); and self-esteem (r = .45, p < .01). The authors did not report conducting item analysis or factor analysis, which is a limitation of this instrument.

**Reliability.** Internal consistency was established across five pilot studies, with Cronbach’s alphas from .76 -.91. Bakina (2013) and Joshi & Fast (Joshi & Fast, 2013) further examined reliability and found Cronbach’s alphas to be .81and .90, respectively. This instrument’s conceptual fit, plus its reliability, validity, and brevity lended itself well to the purposes of the present study.

**Measure of Power Component of Nursing Agency: Willingness to activate RRS.**

Review of literature revealed no published instrument measuring nurses’ willingness to activate the RRS with well-established psychometric properties. In this study, willingness to activate the RRS was measured by a set of three items adapted from an instrument with limited known psychometric properties (Jones et al., 2006b): (1). I am willing to activate the rapid response team if I am worried about my patient. (2). I am willing to activate the rapid response team for a patient I am worried about, even if the vital signs are normal. (3). If my patient meets the rapid response team activation criteria but does not look unwell, then I am not willing to activate the rapid response team (Appendix C).
These questions were adapted from a questionnaire “Survey of Nurses’ Attitudes to the Medical Emergency Team,” originally developed by Jones et al. (2006) to measure nurses’ attitude towards the medical response team in a single hospital in Australia. The survey consisted of 17 items rated on a 5-point Likert-type scale (Strongly disagree – Strongly agree). Jones et al. (2006) reported establishing face validity via focus group review but did not report further analysis of validity and reliability.

Jones et al.’s (2006) survey were also adapted by four other researchers (Azzopardi, Kinney, Moulden, & Tibballs, 2011b; Bagshaw et al., 2010b; Jackson et al., 2016b; Radeschi et al., 2015). All four studies reported establishing face validity via expert panel review, and pilot testing with small samples, but none reported analyzing psychometric properties of the surveys.

The lack of psychometrics examination of Jones et al.’s (2006) survey was a limitation. However, it was selected for use with modifications in this study, because (1). no other instruments with known psychometric properties were found, (2). certain items in this questionnaire closely match the content area of interest of this study, (3). this instrument is the most commonly adapted questionnaire related to perceptions of the RRS found in the literature.

Questions from the original survey not related to nurse willingness to activate the RRS were deleted. The deleted items were related to: (a). perceived purpose of the RRS, (b). perceived helpfulness of the RRS to the patient, (c). perceived effects of RRS activation on nurse workload, (d). perceived reason for RRS activation related to physician or nurse competence.

Only questions related to nurses’ willingness to activate the RRS were retained and modified as needed for use in this study. For example the wording is modified from “I would call a MET…….” to “I am willing to activate the rapid response team…….” The modifications were made to reflect current use of terminology in hospitals, and to reflect the terms used in the
Nursing Agency and Nurse Rapid Response Activation concepts being tested in this study. High score on this modified questionnaire indicates willingness to activate the RRS.

**Measure of Wholly Compensatory Nursing System - Rapid Response System**

**Activation.** Ideally, in this study design, nurses’ implementation of a wholly compensatory nursing system would be measured by hospital data on both (1) incidence and prevalence of nurses activating the RRS when indicated, and (2) incidence and prevalence of “missed” RRS calls, that is, when the nurse should have activated the RRS but did not. However, currently, hospitals are not required by regulatory bodies to record RRS activation as a quality measure (“Measures | Joint Commission,” n.d.). While the study sites do record the incidence of nurse RRS activation, they do not systematically record instances when the RRS activation was indicated but was not done. The incidence and prevalence of “missed” activations were not readily accessible to the researcher.

The accessible option in this study was to measure implementation of the wholly compensatory nursing system via nurses’ self-report of whether they activated the RRS when they felt it was indicated. They were asked to respond to the following questions (Appendix E):

- “In the last 12 months, did you take care of at least one patient whom you felt needed to be seen by the rapid response team?” (Yes/No)
- “If yes, in the past 12 months, have you called the rapid response team?” (Yes/No) Recall bias. The rationale for 12 months.

**Measures of Internal Basic Conditioning Factors.** Internal basic conditioning factors examined in this study includeed Nurses’ age, gender, the level of nursing education, years of practice as a registered nurse, current specialty, specialty certification, and ACLS certification.
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These variables were measured by respondents’ self-report. A demographics questionnaire with questions focused on these variables was constructed by the researcher. (Appendix D)

**Protection of Human Subjects**

Human subjects research approval was granted by the IRB’s at both Hunter College of the City University of New York (Appendix F), and NYU School of Medicine (Appendix G). The NYU School of Medicine IRB covered both the study sites. This study met all specified requirements of the IRBs involved in approving this study. Participation in this study was entirely voluntary. The participants were informed this was a research study, and the purpose of the study was to explore factors associated with nurse activation of the rapid response system in hospitals. They were told that participation was voluntary, and they were free to withdraw the study at any time without consequences. The participants were told that minimal risk is expected. Participation or non-participation would not adversely affect their rights, their jobs, their benefits to which they are otherwise entitled, and their well-being. The participants were also told that there was a possibility that they feel uncomfortable answering some questions, and they could skip any questions they are uncomfortable answering and still remain in the study. They were given a list of resources available at their institutions, in case they needed additional support.

Privacy of the participant was maintained by having the participants to response to the survey on their own time, in the privacy of their own computers or devices. Confidentiality of the participants was maintained via de-identification of data. All data collected was anonymous, no identifying data was collected. Data is stored in Research Electronic Data Capture (REDCap), a secure password protected data collection tool, and only the researcher had the password.

**Recruitment, Screening, Selection, and Enrollment**
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All potential eligible participants were invited to participate. All recruitment occurred via email. All screening, consenting, and survey completion occurred online. No in person recruitment, screening or consenting occurred to avoid possible perception of coercion.

After obtaining IRB approvals, the researcher emailed nurse managers on units that use the rapid response team, in order to seek permission to contact the nurses working on that unit via email. 19 nurse managers were contacted, and 11 gave permission. The researcher sent bulk emails to 600 nurses on the manager-approved units for the study. The email explained the purpose of the study, informed nurses that participation was voluntary, participation or non-participant will not affect their jobs, and no identifying data will be collected from them.

A link to the study page and online consent form was included in the email. Interested volunteers who clicked on the link reached a brief description of the study, and the online consent form (Appendix J). Those who provided consent proceeded to the online screening questionnaire (Appendix K). Only those who answered they have been working one year or more, that they work on a unit that calls the rapid response team, and they are staff nurses (non-management) were eligible.

Data Collection

Data collection took place between May 2018 to September 2018. Registered nurses who were eligible and interested in participating proceeded to the online questionnaire (Appendix A-E). The survey took approximately 15-20 minutes to complete. After the survey was completed, the participants were thanked for their time, and they were exited out of the survey page. REDCap was used to conduct all consenting, screening, and survey responses.

Data Analysis
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The following section focuses on data analysis methods to be used to address the hypotheses in this proposed study.

The three hypotheses were as follows:

1. Nurses’ activating the RRS is positively related to team psychological safety.
2. Nurses’ activating the RRS is positively related to personal sense of power.
3. The association between nurses’ activating the RRS and team psychological safety and personal sense of power is mediated by nurses’ willingness to activate the RRS.

**Descriptive statistics.** Univariate descriptive statistics including frequency distribution, central tendency, and variability were computed for all study variables. Means (with standard deviations) or number and percent (for nominal or ordinal variables) were generated.

**Correlation analysis.** The correlation between team psychological safety and personal sense of power was generated and analyzed. The purpose of doing so was to determine whether multivariable inferential models should be built separately (in the case of high correlation) or dependently (in the case of low or moderate correlation) for these two key explanatory variables. In a similar manner, the correlation between nurse age and years of experience as an RN was generated and analyzed. The rationale for evaluating their correlation is that age-dependent variables tend to be highly collinear, which may inflate variance in multivariable models, and can lead to errors in inference.

**Internal Consistency and Construct Validity.** Cronbach’s alphas were computed for each instrument to assess its internal consistency in the context of this study. The small sample size precluded instrument-specific confirmatory factor analysis to assess potential multidimensionality of the constructs. All multi-item scales were thus assumed to be, and statistically treated as, single-dimension variables.
Nursing Agency and Nurse Rapid Response Activation

**Inferential Statistics.** Bivariate and multivariable logistic regression analysis was performed to assess the relationship between RRS activation and the explanatory variables of interest. Baron & Kenny’s (1986) method was applied to explore whether willingness to activate mediates the association between RRS activation and the key explanatory variables (i.e., personal sense of power and team psychological safety). Specifics of model building and direction, magnitude, and statistical significance of estimated coefficients were evaluated for all models. A p-value of .05 was used to determine statistical significance. Data was analyzed with SAS Version 9.4.
Chapter 4: Results

This chapter presents the results of the analyses described in Chapter 3. The chapter begins with derivation of the analytic sample. This is followed by a discussion of necessary variable modifications and the results of pre-estimation testing. Then, the model-building procedure used to address the research questions is described. The results of descriptive and inferential analysis follow thereafter.

Analytic Sample. One hundred and thirty-two (N = 132) nurses took part in the study. Of this complete set of participants, 5 individuals answered negatively (i.e., “no”) to the question regarding whether they currently work on a unit that calls the Rapid Response Team for patient emergencies and 14 did not respond to the question, leaving 113 potential sample members. Of these, 30 observations were eliminated due to incomplete data on one or more study variables, leaving n = 83 observations (73% complete case percentage) for analysis.

Relevant bivariate testing (i.e., t-tests for continuous variables, chi-square tests for categorical variables; results not shown) was used to investigate systematic differences in study variables between the analytic sample (n = 83) and the sample eliminated due to missing data (n = 30). With one exception (the group excluded because of missing data was more professionally diverse than the retained sample; it included 8 nurse managers and 2 participants who indicated “other” roles within the unit), no differences were detected. This suggests that the analytic sample is largely representative of the full sample of nurses who responded to the survey.

Modification (recoding) of Study Variables. The variable describing participants’ education, originally a 5-category nominal variable (1 = diploma, 2 = associate’s degree, 3 = bachelor’s degree, 4 = master’s degree, 5 = doctoral degree) was recoded to a two-category nominal variable (1 = master’s or doctoral degree, 0 = diploma, associate’s or bachelor’s degree).
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for use in the multivariable models, as there were only 2 participants in the lower two categories (i.e., diploma and associate’s degree), and none in the highest (i.e., doctoral degree) category.

All multi-item variables (team psychological safety, personal sense of power, willingness to activate) were standardized so that their effects on nurses’ activation of RRS could be directly compared. In each case, a score was created by summing responses to individual items—after reverse coding responses to “negatively phrased” items, so that all responses were directionally consistent—and then dividing summed value by the standard deviation of the score among all 83 participants. It is important to note that standardization modifies the interpretation of logistic regression coefficients on the multi-item variables. The odds ratio on, for example, psychological safety is now interpreted as the odds of activating the RRS associated with a one-standard deviation increase in the psychological safety score, rather than a one-unit increase, as would have been the case without standardization.

**Pre-Estimation Testing.** Cronbach’s alpha values for the 7-item team psychological safety measure and 8-item personal sense of power measure were 0.74 and 0.88, respectively. Both values fall within the acceptable range for alpha scores (generally 0.7 – 0.9), suggesting adequate internal consistency. The alpha value for the 3-item willingness to active measure was 0.41, below the lower bound for internal consistency, however not unanticipated for a measure composed of so few (i.e., 3) items.

The correlation between team psychological safety and personal sense of power was moderately high (Pearson correlation coefficient, \( r = 0.68, p < .001 \)), which suggests that multivariable models should be built separately for the two variables. Age and years practicing as a Registered Nurse were similarly highly correlated (\( r = 0.88, p < .001 \)), indicating that only one, but not both, variables should be entered into the multivariable model specifications. As
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registered nursing experience is likely the more salient predictor of RRS activation, it was selected for inclusion.

**Model Building.** The models that test Hypotheses 1 and 2 were built in the following manner. First, bivariate models were fitted to evaluate the crude, or unadjusted, association between RRS activation and: (1) team psychological safety, (2) personal sense of power. Second, adjusted models were estimated, incorporating all of the potential covariates into the models, in addition to the two independent variables of interest. Table 2 provides a summary of the model-building process.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bivariate model I</th>
<th>Bivariate model II</th>
<th>Adjusted model I</th>
<th>Adjusted model II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Safety</td>
<td>β</td>
<td>--</td>
<td>β</td>
<td>--</td>
</tr>
<tr>
<td>Personal Sense of Power</td>
<td>--</td>
<td>β</td>
<td>--</td>
<td>β</td>
</tr>
<tr>
<td>Demographic variables</td>
<td>--</td>
<td>--</td>
<td>β</td>
<td>β</td>
</tr>
</tbody>
</table>

The model that explores Hypothesis 3 was built according to the 4-step process developed by Baron and Kenny (1986) for assessing mediation. The first step involves establishing the association between the outcome of interest (i.e., RRS activation) and the potentially "causal" variables (i.e. team psychological safety and personal sense of power). Thus, RRS activation was regressed separately on team psychological safety and personal sense of power. (The reader should note that this step was already performed in the primary analyses, described above.) The second step determines whether the previously described causal variables are associated with the mediator (i.e., willingness to active). Thus, willingness to activate was regressed on the causal variables in separate models. The third step evaluates the association
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between the outcome and the mediator. As such, RRS activation was regressed on willingness to activate. The fourth, and final, step assesses the impact of the mediator on the association between the outcome and the potentially “causal” variables. The test is quite intuitive. RRS activation was regressed on both the causal variable and the mediator. If the addition of the mediator (i.e., willingness to activate) eliminates the relationship between RRS activation and the causal variables (i.e., reduces the beta coefficient to zero, or a “null effect”), then there is evidence of mediation.

**Descriptive Results.** Table 3 contains a description of the sample. The sample (N = 83) is entirely composed of staff nurses, averages 36.3 years of age, and is 93% female. Average experience as a registered nurse is 10.85 years. Seventy-eight percent hold a bachelor’s degree, 19% hold a master’s degree, and 2% hold a diploma or associate’s degree. Sixty-one percent of participants hold a certificate in a nursing specialty, and 49% are certified in Advanced Cardiac Life Support. Means (SD, range) of team psychological safety, personal sense of power, and willingness to activate are 5.65 (1.00, 6.48), 6.16 (1.00, 5.66), 7.06 (0.99, 4.05), respectively. Finally, two-thirds of participants reported calling the RRT in the previous 12 months.
Table 3. Description of the sample (n = 83)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD) or Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role in unit is staff nurse</td>
<td>83 (100)</td>
</tr>
<tr>
<td>Age</td>
<td>36.30 (9.85)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>77 (93)</td>
</tr>
<tr>
<td>Male</td>
<td>6 (7)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Master’s degree</td>
<td>16 (19)</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>65 (78)</td>
</tr>
<tr>
<td>Associate’s degree</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Diploma</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Years practiced as RN</td>
<td>10.85 (8.93)</td>
</tr>
<tr>
<td>Certification in nursing specialty</td>
<td></td>
</tr>
<tr>
<td>Holds certificate</td>
<td>51 (61)</td>
</tr>
<tr>
<td>Does not hold certificate</td>
<td>32 (39)</td>
</tr>
<tr>
<td>ACLS certified</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>41 (49)</td>
</tr>
<tr>
<td>No</td>
<td>42 (51)</td>
</tr>
<tr>
<td>Team Psychological Safety</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>35.71 (6.33)</td>
</tr>
<tr>
<td>Mode</td>
<td>34.00</td>
</tr>
<tr>
<td>Minimum</td>
<td>7.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>48.00</td>
</tr>
<tr>
<td>Standardized</td>
<td>6.16 (1.00)</td>
</tr>
<tr>
<td>Personal Sense of Power</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>43.54 (7.08)</td>
</tr>
<tr>
<td>Mode</td>
<td>44.00</td>
</tr>
<tr>
<td>Minimum</td>
<td>16.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>56.00</td>
</tr>
<tr>
<td>Standardized</td>
<td>5.65 (1.00)</td>
</tr>
<tr>
<td>Willingness to Activate</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>17.45 (2.47)</td>
</tr>
<tr>
<td>Mode</td>
<td>18.00</td>
</tr>
<tr>
<td>Minimum</td>
<td>11.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>21.00</td>
</tr>
<tr>
<td>Standardized</td>
<td>7.06 (0.99)</td>
</tr>
<tr>
<td>Felt RRS should be activated</td>
<td>57 (69)</td>
</tr>
<tr>
<td>Nurse RRS Activation</td>
<td>55 (66)</td>
</tr>
</tbody>
</table>
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Table 4 contains a cross-tabulation of the RRT activation variables. Results indicate almost complete overlap between nurses feeling RRT should be activated and RRT activation. Only 4 of 83 observations differed in responses to the two variables.

Table 4. Cross-tabulation of nurse RRS activation variables (n = 83)

<table>
<thead>
<tr>
<th>Felt RRS should be activated</th>
<th>Nurse RRS activation</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>25 (30)</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>54 (65)</td>
</tr>
</tbody>
</table>

Inferential Results. The results of bivariate analyses (Table 5) suggest that there is a positive, although not statistically significant (i.e., null), association between RRS activation in the past 12 months and psychological safety (Odds Ratio [OR] = 1.28; 95% Confidence Interval [CI] = 0.82, 2.03, \( p = 0.28 \)), and a positive, statistically significant, association between RRS activation and personal sense of power (OR = 1.84; 95% CI = 1.10, 3.05, \( p < .05 \)). This latter effect suggests that each additional standard deviation of personal sense of power is associated with 84% increased odds of RRT activation. (One should note that the standard deviation of personal sense of power is 1, which means that a one-SD change is equivalent to a one-unit change, and the interpretation of a one-unit and on-standard deviation change on the odds of the outcome is the same.)

The multivariable results (Table 5) are consistent with the bivariate findings. Controlling for other factors, there is a null relationship between RRS activation and psychological safety (OR = 1.40; 95% CI = 0.86, 2.27, \( p = .18 \)) and a statistically significant association between RRS activation and personal sense of power (OR = 1.92; 95% CI = 1.14, 3.25, \( p < .05 \)). In fact, the RRS-personal sense of power relationship is slightly increased by the addition of covariates (from 1.84 to 1.92), which suggests minor negative confounding with one of the control
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variables. None of the control variables is associated with RRS activation in either the model focused on psychological safety or that focused on personal sense of power.

Table 5. The association between RRS activation and psychological safety and personal sense of power: Bivariate and Adjusted models (n = 83)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bivariate model I</th>
<th>Bivariate model II</th>
<th>Adjusted model I</th>
<th>Adjusted model II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Psychological Safety</td>
<td>1.28 (0.82, 2.03)</td>
<td>--</td>
<td>1.40 (0.86, 2.27)</td>
<td>--</td>
</tr>
<tr>
<td>Personal Sense of Power</td>
<td>--</td>
<td>1.84* (1.10, 3.05)</td>
<td>--</td>
<td>1.92* (1.14, 3.25)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>--</td>
<td>--</td>
<td>1.15 (0.19, 6.91)</td>
<td>1.28 (0.21, 7.76)</td>
</tr>
<tr>
<td>Male</td>
<td>--</td>
<td>--</td>
<td>Ref.</td>
<td>Ref.</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master’s or higher</td>
<td>--</td>
<td>--</td>
<td>2.22 (0.57, 8.63)</td>
<td>1.92 (0.48, 7.82)</td>
</tr>
<tr>
<td>Bachelor’s or lower</td>
<td>--</td>
<td>--</td>
<td>Ref.</td>
<td>Ref.</td>
</tr>
<tr>
<td>Years practiced as RN</td>
<td>--</td>
<td>--</td>
<td>0.99 (0.94, 1.04)</td>
<td>0.98 (0.93, 1.03)</td>
</tr>
<tr>
<td>Certificate in nursing specialty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holds certificate</td>
<td>--</td>
<td>--</td>
<td>0.67 (0.25, 1.81)</td>
<td>0.68 (0.24, 1.90)</td>
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<tr>
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<td>--</td>
<td>0.98 (0.38, 2.54)</td>
<td>1.06 (0.40, 2.86)</td>
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<tr>
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Table values comprise odds ratios and 95% Confidence Intervals. *p < .05

The results of mediation analyses (Table 6) do not indicate evidence that willingness to activate is in the causal pathway between actual RRS activation and personal sense of power.

(The reader should note that willingness was not evaluated as a mediator in the RRS activation- psychological safety relationship because the first condition—i.e. that there is a statistically
Nursing Agency and Nurse Rapid Response Activation

significant association between the outcome (i.e., RRS activation) and the potentially causal
variable (i.e., team psychological safety)—did not hold in our principal analyses.) The mediation
hypothesis was rejected when the condition necessary to satisfy the second step of the Baron and
Kenny (1986) procedure (i.e., personal sense of power, the causal variable, is associated with
willingness to activate, the potential mediating variable) was not confirmed ($\beta = 0.15, SE = .11, p
= 0.16$). The remaining two steps of the Baron and Kenny method were taken as a formality.
However, the conclusion is definitive: there is no evidence that willingness to activate mediates
the association between RRS activation and personal sense of power.

Table 6. Willingness to activate as a mediator in the RRS-personal sense of power relationship:
Baron and Kenny’s mediation analysis ($n = 83$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Step 1a</th>
<th>Step 2b</th>
<th>Step 3c</th>
<th>Step 4d</th>
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<tr>
<td>Personal Sense of Power</td>
<td>1.84 (1.10, 3.05)</td>
<td>0.15 (.11)</td>
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<td>1.72 (1.05, 2.85)</td>
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<tr>
<td>Willingness to activate</td>
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<td>--</td>
<td>2.13 (1.28, 3.56)</td>
<td>2.04 (1.21, 3.45)</td>
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</table>

\[ a \] Dependent variable is RRS activation; odds ratio and 95% CI presented; statistically significant association; Baron and Kenny condition 1 holds.

\[ b \] Dependent variable is willingness to activate; beta coefficient and standard error presented; statistically non-significant association; Baron and Kenny condition 2 does not hold.

\[ c \] Dependent variable is RRS activation; odds ratio and 95% CI presented; statistically significant association; Baron and Kenny condition 3 holds.

\[ d \] Dependent variable is RRS activation; odds ratio and 95% CI presented; association between RRS activation and personal sense of power not reduced to null with addition of willingness to activate; Baron and Kenny condition 4 does not hold.
Chapter 5: Discussion

The aims of this cross-sectional study were to 1) Investigate the relationships among team psychological safety, personal sense of power, and nurse RRS activation. 2) Test select concepts in Orem’s Self Care Deficit Nursing Theory (SCDNT) in the context of nurse RRS activation, specifically, the relations among nursing agency foundational disposition, nursing agency power component, basic conditioning factors, and wholly compensatory nursing system.

According to Orem (2001), the wholly compensatory nursing system refers to a nursing model where the patient is unable to engage in self-care actions, and the nurse acts for the patient. When patients deteriorate, they cannot act for themselves. Nurses then need to activate the RRS to initiate implementation of the wholly compensatory nursing system. Nurse RRS activation was examined as the outcome variable in this study. The results indicated that nurses who participated reported a 95% activation rate.

In Orem’s (2001) view, nurses need to possess as well as exercise nursing agency in order to implement the wholly compensatory nursing system. However, even though Orem named nursing agency as a major concept in the SCDNT (Orem, 2001), this concept has not been not fully developed or tested (Banfield, 2011b). This study added to nursing knowledge by empirically testing personal sense of power and willingness to activate the RRS as potential variables of nursing agency. Results indicated that personal sense of power was positively related to nurse RRS activation, however, willingness to activate was not found to be related to nurse RRS activation.

In addition to naming nursing agency and wholly compensatory nursing system as core concepts of the SCDNT, Orem (2001) also named external basic conditioning factors and internal basic conditioning factors as peripheral concepts in her theory. Orem (2001) proposed
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that these factors may influence nursing agency, as well as influence nurse deliberate actions to implement the appropriate nursing system. This study added to nursing knowledge by testing team psychological safety as a potential external basic conditioning factor, as well as tested nurse demographics as internal basic conditioning factors. Results showed that psychological safety and nurse demographics are not significantly related to nurse RRS activation.

This chapter will discuss the results of this study. First, the findings as they relate to the SCDNT will be discussed, and conclusions presented. Second, limitations of this study will be examined. Finally, implications for nursing practice, as well as for future research will be discussed.

Nurse RRS Activation as Wholly Compensatory Nursing System Implementation

Nurse implementation of a wholly compensatory nursing system was operationalized as nurse RRS activation in this study. When patients deteriorate, they can no longer engage in self-care actions. Nurses need to activate the RRS as a deliberate action to implement a wholly compensatory nursing system. In this study, 57 out of 83 cared for at least one patient whom they felt needed the RRS within the last 12 months. Of those, 95% (n = 54) activated the RRS accordingly. Only 3 out of the 57 (5%) missed activating the RRS. The other 30% of respondents didn’t care for a deteriorating patient needing RRS in the last 12 months, and therefore didn’t need to activate the RRS.

The activation rate in this study was significantly higher than the rate of 21-57% reported in previously studies (Barwise et al., 2016b; Calzavacca et al., 2010; Chen et al., 2015; MERIT Investigators, 2005). Reasons for the high RRS activation rate may be specific to this study setting. It may be that many facilitators for nurse RRS activation cited in the literature are present in this setting. For example, this researcher is familiar with the study site, and the
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Organizational culture at the study site highly encouraged nurse RRS activation. Additionally, RRT members were typically supportive of nurses who activated. It may also be that nurses who readily activated the RRS participated at a higher rate than those who missed activations. Unfortunately, missed RRS activation data was not a performance metric collected by the study site. However, future research might focus on examining the relationships among missed RRS activations, team psychological safety, personal sense of power, and nurse willingness to activate.

Team Psychological Safety as an External Basic Conditioning Factor

Orem (2001) viewed external basic conditioning factors (BCFs) as factors in the practice environment that may inhibit or enable nursing agency. If barriers exist in the environment that prevents nurses from exercising their full agency, then nurses might not readily activate the RRS when patients show signs of clinical deterioration. In this study, external BCF was operationalized as team psychological safety.

The raw mean, mode, minimum and maximum scores for team psychological safety is listed in Table 4.2. The mean score is 35.71 out of a highest possible score of 49. Even though there was a positive relationship between team psychological safety and nurse RRS activation, it was not statistically significant (OR = 1.28, 95% CI = 0.82-2.03, p = 0.28). Therefore, hypothesis one is not supported by the results.

To date, this is the only study examining the relationship between team psychological safety and nurse RRS activation. It was surprising not to find a significant relationship between the two variables. The small sample size available for this study may be a factor. However, in retrospect, while there is strong evidence in the literature supporting team psychological safety as a predictor of speaking up and reporting errors (Yanchus, Derickson, Moore, Bologna, &
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Osatuke, 2014; Lee, Yang, & Chen, 2016; Leroy et al., 2012; Schwappach & Gehring, 2015; Wakeam, Hyder, Ashley, & Weissman, 2014), there are no studies to support that there is a relationship between team psychological safety and nurses implementing interventions at the point of care, such as activating the RRS. It may be that speaking up and RRS activation are divergent concepts, that team psychological safety is a predictor for the former but not for the latter. However, future studies might investigate relationships between team psychological safety, nurse RRS activation and speaking up. In conclusion, there is no empirical evidence in this study to support team psychological safety to be a predictor of nurse RRS activation at this time.

**Personal Sense of Power as a Foundational Disposition of Nursing Agency**

In this study, foundational disposition of nursing agency was operationalized as personal sense of power. Orem (2001) posited that nurses need to possess key foundational dispositions, or internal characteristics, that enable them to provide nursing care. For example, self-concept, self-awareness, self-value, and self-acceptance were named by Orem (2001, p.262-263) as foundational dispositions. Personal sense of power was investigated as a potential foundational disposition that enables nurses to activate the RRS when patients deteriorate. The raw mean, mode, minimum and maximum scores for personal sense of power is listed in Table 3. The mean score is 43.54 out of a highest possible score of 56.

Findings from inferential analyses supported hypothesis two: there was a significant positive relationship between personal sense of power and nurse RRS activation (OR = 1.84; 95% CI = 1.10, 3.05, p < .05). It is noteworthy that there are currently no other studies examining personal sense of power in nurses, and no other studies investigating the relationship between personal sense of power and nurse RRS activation. However, Anderson, John, &
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Keltner (2012) found that personal sense of power is associated with higher optimism for outcomes of one’s actions. In the literature, nurses reported fear of criticism, ridicule, and hostility from colleagues as a major barrier to RRS activation (Astroth et al., 2013; Leach & Mayo, 2013; Shearer et al., 2012). In the context of nurse RRS activation, it may be that personal sense of power is a key disposition that enables nurses to overcome the fears and feel optimistic about their decision to activate the RRS.

This study contributed evidence that personal sense of power is a predictor of nurse RRS activation, however, this finding may only partially support that personal sense of power is a foundational disposition. In Orem’s (2001) view, foundational dispositions for both self-care agency and nursing agency are self-oriented psychological constructs drawn from the field of cognitive development and social psychology. Previous studies on self-care agency suggested that several psychological constructs, specifically, self-esteem (Anderson, 2001; Anderson & Olnhausen, 1999) and spirituality (White, 2010) may be foundational dispositions of self-care agency. Personal sense of power is congruent with the above concepts as a self-oriented psychological construct. Therefore, in conclusion, results of this study suggest that personal sense of power may be a foundational disposition of nursing agency, but further studies to confirm the relationship are needed in the future.

Future studies may add to nursing knowledge by examining the relationship between nurses’ personal sense of power and other key nursing interventions for wholly compensatory nursing system implementation, for example nurse activation of different types of emergency responses including cardiac arrest code, stroke code, or massive transfusion codes. Researchers may also investigate other critical but non-emergent nursing interventions, for example nurse notification of child or adult protective services for potential abuse situations. Additionally, in
order to further test the SCDNT, future research may examine the relationship between nurses’ personal sense of power and implementation of the partially compensatory nursing system, as well as the educative-supportive nursing system. For example, to test the partially compensatory system, researchers may investigate whether there are relationships between personal sense of power and prevention of pressure ulcers, patient falls, hospital-acquired infections, or other nurse-sensitive outcomes.

**Nurse Willingness to Activate RRS as a Power Component of Nursing Agency**

Orem (2001) viewed the power component of nursing agency as enabling capabilities of the nurse, which included willingness to provide nursing. In this study, power component was operationalized as nurses’ willingness to activate the RRS. Hypothesis 3 was tested to determine whether nurse willingness to activate RRS plays a mediator role between team psychological safety, personal sense of power, and nurse RRS activation. The raw mean, mode, minimum and maximum scores for willingness to activate is listed in Table 4.2. The mean score is 17.45 out of a highest possible score of 21. Results of the regression analyses did not support hypothesis three. Willingness was not found to be in the causal pathway between team psychological safety, personal sense of power, and nurse RRS activation. However, it was surprising not to find evidence that willingness to activate mediates the association between nurse RRS activation and personal sense of power. Reasons for this finding may be as follows.

First, the instrument for measuring nurse willingness to activate did not have strong psychometrics (alpha = 0.41). It was modified by the researcher and used for the first time in this study. It only consisted of three items which may have been problematic. Second, nurse
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willingness as a power component of nursing agency has not been examined in prior studies, so there was not previous empirical evidence to support this variable as a factor affecting nurse RRS activation. Nurse’ knowledge and attitudes as a power component have been more commonly investigated (Rice, 2000; Vincent, 1999; Watson, 2002), but with varying results. In conclusion, this study did not provide evidence that nurses’ willingness to activate RRS is in the causal pathway between team psychological safety, personal sense of power, and nurse RRS activation.

**Nurses Demographic Factors as Internal Basic Conditioning Factors**

Internal BCFs was operationalized as years of practice, education level, gender, specialty certification, and ACLS certification. None of the above variables were found to have statistically significant association with team psychological safety, personal sense of power, or nurse RRS activation.

This finding was not completely unexpected. While previous majors studies have found nurse education level to be a key predictor of patient outcomes (Aiken & Patrician, 2000; Aiken et al., 2011; Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Aiken, Clarke, Sloane, Lake, & Cheney, 2008), other studies demonstrated minimal (Vincent, 1999) to no relationship (Rice, 2000; Watson, 2002) between nurse demographics and knowledge or attitudes, or nursing actions at the point of care. Current literature on barriers to nurse RRS activation also did not find significant relations between demographics and nurse RRS activation, and only years of practice was found to be negatively correlated with nurse reluctance to activate (Jackson et al., 2016b).

In this sample, nurses may be influenced by other factors in their particular practice setting, which resulted in the high nurse RRS activation rate. However, in conclusion, results
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from this study did not support that nurse demographic factors as predictors of nurse RRS activation, personal sense of power, or team psychological safety.

**Limitations**

Small sample size and relatively low response rate in this study was a major limitation. 600 nurses were contacted, and 132 responded, resulting in a response rate of 22%. A likely reason was that during the study period, the hospital system was undergoing a major transition. A new hospital building was opening, and many of the eligible nurses were busy being involved in moving to the new hospital, resulting in fewer nurses volunteering for the study.

Another limitation was related to the sample. It is possible that the respondents were not representative of the population being studied. The majority (97%) of respondents had a baccalaureate degree as their highest nursing degree, only 2% had diploma or associates degree. It may be that nurses with baccalaureate or masters responded at a higher rate than others. This may limit the generalizability of the findings. In this study, only nurses caring for adult patients were eligible, and nurses caring for pediatric populations were not included. Therefore, study findings may not be generalized to nurses for pediatric populations.

Respondents may also have self-selected based on their experience or attitudes with the RRS. The vast majority of respondents who took care of deteriorating patients activated the RRS. It may be that the sample was biased towards nurses who activated. Additionally, all respondents worked in a single healthcare system, which may limit the generalizability of the results. Future studies may include nurses working in different healthcare facilities in different geographic areas.

Measurement of both the nurse RRS activation variable, and the willingness to activate variable was another limitation. Potential psychometric concerns with the nurse willingness to
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activate were discussed previously in this chapter. Nurse RRS activation was a self-reported
measure, as nurse activation data was not available to this researcher. It is possible that nurses
may have misremembered whether they activated the RRS in the past 12 months, or
demonstrated recall bias when they responded to the RRS activation questions.

**Implications for Future Research**

**Theory Development.** This research contributed to a growing body of nursing
knowledge by testing relationships among select concepts in Orem’s (2001) SCDNT, in the
context of nurse RRS activation. The findings added to understanding of personal sense of power
as a nursing agency foundational disposition, and its relationship to RRS activation, as
implementation of a wholly compensatory nursing system.

Although not all expected theoretical linkages were supported, findings from this study
provide a foundation to further develop the theory of nursing systems within the SCDNT.
Currently, there is a lack of instruments to measure nursing agency. This is study was an attempt
to fill the gap. However, future studies with more power are needed. Team psychological safety
was found to have a positive but not statistically significant relationship with nurse RRS
activation. Future research may further test the linkage with a larger sample, which may add to
understanding of team psychological safety as a potential external BCF. In regards to testing
internal BCF, several studies did not find nurse demographic factors to have significant
relationships with variables related to nursing agency. These findings may suggest that
researchers interested in testing SCDNT may need to develop new ways to view internal BCFs
and demographic factors within the theory.

**Applied Research.** This study contributed to a growing body of research by examining a
relatively new concept, personal sense of power, in the nursing population. Researchers might
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focus on nurses’ personal sense of power because even though other internal psychological concepts including nurses’ self-esteem (Leão et al., 2017; Mathew, Ram, Bhattacharjee, & Sharma, 2013; Santos et al., 2017) and self-confidence (Rautava et al., 2013; Twibell et al., 2008) has been explored in recent studies, the concept of personal sense of power has a unique quality that has not been studied in nurses. It refers to nurses’ beliefs of their ability to influence others’ attitudes and behaviors, expanding beyond nurses’ internally focused beliefs of their own worth (self-esteem) or abilities to perform (self-confidence). Personal sense of power is unique because it introduces an externally focused dimension to nurses’ foundational self-beliefs. As nurses play increasingly vital roles in advancing health in society, nurses’ belief about their ability to influence the others is increasingly important. Researchers may need to investigate nurses’ perception of their influence at multiple levels and practice settings, including at the bedside, in academia, at the organization level, at the community level, and at the societal level. Findings of these future research may have implications on clinical practice, nursing education, intra- and inter- professional collaboration, as well as on health policy. The Institute of Medicine (IOM) Future of Nursing report (Institute of Medicine, 2010) advocated for doctoral-prepared nurses to advance nursing science, as well as for nurses to be full partners in redesigning healthcare in the United States. In order to implement these key messages, researchers need to develop further knowledge on nurses’ personal sense of power. For example, researchers may investigate barriers and facilitators of personal sense of power in different nursing populations, including bedside nurses, advanced practice nurses, nursing students, nurse educators, nurse researchers, and nurse policy makers. Investigators may also focus on finding effective ways to develop nurses’ personal sense of power. For example, researchers may study whether education using simulation might be an effective technique to maximize personal sense of power.
Implications for Nursing Practice

The IOM Future of Nursing report (Institute of Medicine, 2010) called for nurses to lead change in improving access to care and quality of care (Institute of Medicine, 2010). The current study findings suggested that nurses’ personal sense of power is a key factor that enables nurses to activate the RRS, as well as highlighted nurses’ key role in acting and advocating for patients who cannot act for themselves. These key messages contribute to new implications for nursing practice at multiple levels. At the individual level, nurses need to strengthen their personal sense of power in order to act on behalf of patients. For example, nurses may consider attending professional development programs to learn how to increase their influence at work. Additionally, at the team and organizational level, nurses may need to collaborate with other healthcare professionals to develop strategies to support nurse RRS activation. For instance, nurses and physician leaders may need to come to agreements on how to address situations when nurses receive ridicule for activating the RRS. Or, nurses may collaborate with other healthcare professions to conduct simulations focusing on RRS activation scenarios, and then conduct interprofessional debriefings to discuss how to eliminate barriers to nurse RRS activations.

Finally, in order to eliminate health disparities, nurses need to act on behalf of patients beyond the bedside. They need to act at the community and society level to influence health policy. Nurses cannot stay silent when health disparities remain unaddressed. The IOM Future of Nursing report (Institute of Medicine, 2010) calls for nurses to view policy as something that they can shape and mold, instead of something that happens to them. In order to shape policy, nurses need to serve actively on committees, commissions, and boards where policy decisions are made. However, currently, multiple barriers prevent nurses from serving as full partners. Barriers include laws and regulations, historical bias, and resistance from other professions.
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(Institute of Medicine, 2010). To overcome barriers, nurses need to exercise their personal sense of power to demand more opportunities for collaboration, so they can seize all possible opportunities to advocate for patients who cannot act for themselves.

**Conclusion**

Nurses play a critical role in frontline patient surveillance, and have a fundamental duty to act for patients in need. The current study contributed to the body of knowledge on nurse RRS activation, added to knowledge that may help to further develop Orem’s SCDNT, as well as introduced knowledge on personal sense of power in the nursing population. These new information may lead to improve positive outcomes for hospitalized patients, as well as improve nursing practice in the future. Findings from this study may be used by future researchers to build further knowledge, with the ultimate goal of eliminating health disparities for all patients.
Figure 5: PRISMA 2009 flow diagram Nurse RRS Activation

- Records identified through database searching: CINAHL, PubMed, Web of Science, ProQuest Central, JSTOR
- Additional records identified through other sources (n = 2)

Records after duplicates removed (n = 615)

- Records excluded (n = 527)

Records screened (n = 615)

- Full-text articles assessed for eligibility (n = 88)
  - Studies included in quantitative synthesis (n = 8)
  - Studies included in qualitative synthesis (n = 5)
  - Full-text articles excluded (n = 75)
    - Nurse specific data not reported (69)
    - Practice guidelines update (2)
    - Quality improvement project with no data reported (5)
Figure 6: PRISMA 2009 flow diagram Nurse Willingness to Activate RRS

Records identified through database searching: CINAHL, PubMed, Web of Science, ProQuest Central, JSTOR

Additional records identified through other sources
(n = 4)

Records after duplicates removed
(n = 186)

Records screened
(n = 186)

Records excluded
(n = 167)

Full-text articles assessed for eligibility
(n = 19)

Full-text articles excluded
(n = 5)
- Poor quality (1)
- Quality improvement project, no data reported (2)
- Did not distinguish nurse-

Studies included in quantitative synthesis
(n = 5)

Studies included in qualitative synthesis
(n = 9)
Figure 7: PRISMA 2009 flow diagram Personal Sense of Power

Records identified through database searching: CINAHL, PubMed, Web of Science, ProQuest Central, JSTOR

Additional records identified through other sources (n = 8)

Records after duplicates removed (n = 133)

Records screened (n = 133)

Records excluded (n = 124)

Full-text articles assessed for eligibility (n = 9)

Full-text articles excluded (n = 1)
- Editorial

Studies included in quantitative synthesis (n = 8)

Studies included in qualitative synthesis (n = 0)
Figure 8: PRISMA 2009 flow diagram Team Psychological Safety

Records identified through database searching: CINAHL, PubMed, Web of Science, ProQuest Central, JSTOR

Additional records identified through other sources (n = 2)

Records after duplicates removed (n = 222)

Records screened (n = 222)  Records excluded (n = 203)

Full-text articles assessed for eligibility (n = 19)

- Editorial (3)
- Quality improvement project without data reported (2)
- Non-healthcare setting (1)
- Research no related to

Studies included in quantitative synthesis (n = 7)

Studies included in qualitative synthesis (n = 5)
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**Appendices**

A. Quantitative Studies Critical Appraisal Summary Table
B. Qualitative Studies Critical Appraisal Summary Table
C. Data Extraction Table - Nurse RRS Activation
D. Data Extraction Table – Nurse Willingness to Activate RRS
E. Data Extraction Table Personal Sense of Power
F. Data Extraction Table Psychological Safety
G. Team Psychological Safety Scale (Amy Edmondson, 1999)
H. Personal Sense of Power Scale (Cameron Anderson, John, et al., 2012)
I. Modified Nurses’ Attitudes to the Medical Emergency Team Questionnaire (Jones et al., 2006b)
J. Demographics Questionnaire
K. Nurse Activation of RRS Questionnaire
L. IRB approval Hunter College of the City University of New York
M. IRB approval NYU School of Medicine
N. Email to Nurse Managers
O. Study Participant Recruitment Letter
P. Study Consent Form
Q. Study Screening Questionnaire
## Appendix A: Quantitative Studies Critical Appraisal Summary Table (Page 1)

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- Anderson 2012b
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- Choi 2014
- Davidson 2015
- Davw 2016
- Douglas 2016
- Edmundo 1999
- Eid 2012
- Quinlan 2013
- Jackson 2016
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### Appendix B: Qualitative Studies Critical Appraisal Summary Table

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<td>1 Boniatti 2014</td>
<td>What is the prevalence and factors associated with RRT activation delays</td>
<td>Quantitative</td>
<td>Hospital RRS activation data review Delayed call defined as no call made within 30min-24 hours after initial documentation of RRS criteria</td>
<td>Adult inpatients in an 18 months period at a large teaching hospital in Brazil</td>
<td>Criteria: HR &lt; 40 or &gt; 140, systolic BP &lt; 90mm Hg, RR &lt; 5 or &gt; 36, O2 sat decrease ≥ 2 points, O2 Sat &lt; 90%, threatened airway, seizures &gt; 5min, and general concern about patient. Who can activate: Any hospital member can activate 1148 patients required RRS activation 40 calls/1000 admissions RRT composition: senior intensivist + intensivist (no nurse) Delayed activation = 21.4% RNs: 771 calls total (67%). Accounts for 70.4% of timely calls, and 55.3% of delayed calls. Resident: 292 calls total (19.7%). Accounts for 22.6% on time calls, and 33% delayed calls Attending: 85 calls total (5.7%). Accounts for 7% timely calls, 8.9% delayed calls. Prevalence of delayed calls significantly lower for nurses (17.6%) compared with residents (29.2%). Delay calls associated with higher 30-day mortality</td>
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<td>What constitutes nurses worry or concern during early recognition of deteriorating patients</td>
<td>Systematic Review</td>
<td>Systematic review</td>
<td>18 studies included</td>
<td>when nurses used “worry” or “concerned,” they were noticing a plethora of subtle changes, including lethargy, not getting out of bed, slumping, agitation, unusual pain, clamminess, skin looking ashen or gray, not eating as usual, vomiting, not acting the usual way, just doesn’t look well, feeling something is not right but can’t say what it is, and just a gut feeling something is wrong.</td>
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<td>Guinan 2013</td>
<td>What is the incidence of patients with VS that met RRS criteria?</td>
<td>Quantitative, Retrospective chart audit</td>
<td>568 patients at a 400-bed private hospital in Melbourne, Australia</td>
<td>SBP &lt; 90mmHg, HR &gt; 130, RR &lt; 6 or &gt; 30, O2 Sat &lt; 90% on O2 therapy. Subjective concern.</td>
<td>Any staff can activate 82 (14%) met RRS criteria. LOS two times greater for those meeting RRS criteria. Only 3 (4%) had documented RRS activation. 1 ICU transfer, 2 stabilized on ward. 2 of these pts died during hospitalization. <strong>If no RRS activation: 46% had other documented response, 54% had no documented response. 64% with documented response: nurses self managed (supplemental O2, hypoxia), repositioning (hypotension), 36% nurse called MD.</strong> Single institution no data reported on reason for no activation, or reason for no documented response.</td>
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<td>Hart 2016</td>
<td>What are nurses experiences as first responders during deterioration event?</td>
<td>Qualitative, Semi-structured interviews</td>
<td>27 Med/Surg RNs with previous RRS activation experience from 5 hospitals in the US</td>
<td>Criteria: did not report Who can activate: did not report 3 patterns: recognizing and responding to event (themes: early warning signs, continuity in case, intuition), managing event (themes: cognitive, technical, behavioral skills), challenges encountered during the event (theme: work environment complexity)</td>
<td>Limited to nurses experienced with RRS activation. No report on nurses who never activated the RRS.</td>
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<td>Kitto 2015</td>
<td>What are staff's experiences with the RRS, and what are factors mediating RRS usage?</td>
<td>Qualitative, Focus groups</td>
<td>27 physicians, 62 RNs in 10 focus groups across 4 hospitals in Australia</td>
<td>Criteria: did not report Who can activate: did not report</td>
<td><strong>Nurses:</strong> Viewed RRS as a preventative process by accessing greater support in patient deterioration. <strong>Physicians:</strong> Considered RRS useful in patient stabilization.</td>
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<td>2014</td>
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<td>How does the profession of the RRS activator affect patient outcomes</td>
<td>Quantitative, Retrospective chart review</td>
<td>800 RRS activations over a 49 month study period</td>
<td>Criteria: physiological parameters (did not list), and staff concern. Who can activate: any health care staff. 800 activations on 625 patients (31/1000 admission). 174 activations (21.8%) resulted in ICU admission. Physicians activate 53%, proportionally higher ICU admission rate compared to RN activations (25% vs 15%). Nurse activation associated with higher sedative use (5.9 vs 2.7), more likely during day and on surgical patient. No difference in indications (resp, circ, neurologic), number and types of interventions.</td>
<td>Single site, Small sample size</td>
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<td>What is the communication process between floor clinicians and RRT when there is &quot;general&quot; concern</td>
<td>Qualitative Grounded theory (Corbin and Strauss)</td>
<td>Focus group, 28 RNs in 4 focus groups, and 15 MDs in 3 focus groups at a large tertiary hospital</td>
<td>Criteria: physiological parameters, general concern. Who can activate: did not report. 3111 RRS activations in 3 years. 994 (32%) for general concern.</td>
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<td>What are the practices used by nurses during detection and management of deteriorating patient</td>
<td>Quantitative</td>
<td>Patient chart review</td>
<td>123 cardiac arrest cases in a one year study period at a 700-bed general hospital in the UK</td>
<td>Nurses reported increased willingness to activate using the &quot;general concern criteria&quot; if: MD orders are unclear regarding a potentially deteriorating patient, felt not listened to, poor handoff during ward transfer, code status/advanced directives undecided, unable to reach covering physician, junior MD unwilling to adjust management plan, overwhelmed by workload, lacking confidence in covering physician.</td>
<td>Single institution Small sample size No reporting of nurses experience level, education</td>
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</table>

<p>| 9 | Parker 2014 | What is the relationship between nurse RRS activation decision model and RRT activation frequency | Quantitative quasi-experimental | Nurse decision-making instrument (Lauri &amp; Salanter 2002) Self report RRS activation frequency | 87 med/surg RNs from 3 community hospitals in the US who activated RRS at least once in the last 12 months | Nurses activated RRS 1-15 times over 12 months (n=3, SD, 2.5) 70% used analytic/intuitive model (mean 2.56 RRS activations) 21.8% used analytic decision model with significantly greater frequency (mean 4.7 activations); 8% used intuitive decision model (mean 2.3 activations) Between group difference significant (p=.003) | Self-report RRS activations |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Author/Year</th>
<th>Study Question</th>
<th>Study Design</th>
<th>Observations</th>
<th>Criteria</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Psirides 2016</td>
<td>What is the epidemiology of RRS activations?</td>
<td>Quantitative Prospective observational study</td>
<td>351 RRS activations for 313 patients at 11 hospitals, over a 3 month study period</td>
<td>Physiological parameters, pain, , bleeding, staff concern. Who can activate: nurse, physicians, family. Average 1 activation every 10.5 hrs. 75.5% nurse activations. Most common triggers: EWS (52.2%), staff concern (25.7%). 30 day mortality for activated patients = 19.8%, 56.2% discharged home. 22.5% had DNR written during RRS activation, 2.8% died during call.</td>
<td>No delay data reported</td>
</tr>
<tr>
<td>11</td>
<td>Stolldorf 2015</td>
<td>What are RRS deployment characteristics in a statewide RRS collaborative</td>
<td>Quantitative Cross sectional</td>
<td>32 hospitals (academic &amp; community) in the southeastern US</td>
<td>Did not report Who can activate: 100% RN can activate. 62% families, 55% patients. 33% only RN and staff. 61% enabled staff to evaluate and give feedback to the RRT. 1 hospital no RRS implemented.</td>
<td>No patient outcomes reported</td>
</tr>
<tr>
<td>Author</td>
<td>Research Questions</td>
<td>Method</td>
<td>Measures</td>
<td>Sample</td>
<td>Findings</td>
<td>Limitations</td>
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<tr>
<td>1 Astroth 2013</td>
<td>What are barriers and facilitators to nurses' decisions to activate the RRS</td>
<td>Qualitative</td>
<td>Structured interviews with 9 questions</td>
<td>13 RNs on 3 med/surg units in a 155-bed midwestern hospital in the US</td>
<td><strong>Facilitators:</strong> RRT characteristics: perceived supportiveness, communication skills. Unit culture: perceived supportiveness of nurse leaders, overall teamwork culture. <strong>Barriers:</strong> RRT characteristics: criticism, condescension, negative attitude, complaints about being busy in the ICU. Unit culture: fear of appearing stupid to colleagues, and fear of making physician unhappy. Nurses unwilling to activate even after one negative experience. Responses varied on whether nurses received education on RRT.</td>
<td>Single institution. Unable to find nurses who had never activated the RRT.</td>
</tr>
<tr>
<td>2 Astroth 2017</td>
<td>What are barriers and facilitators to nurses' decisions to activate the RRS Testing instrument RRT Facilitators and Barriers Survey (RRT-FBS)</td>
<td>Quantitative Survey</td>
<td>52 item RRT Facilitators and Barriers Survey (RRT-FBS) developed by Jenkins, Astroth &amp; Woith, 2015: A 30 item survey with 3-point Likert scale</td>
<td>202 RNs in 4 hospitals in Illinois US</td>
<td>Experienced nurses more likely to view RRT as an asset. Nurses working in supportive units less likely to see negative RRT characteristics (condescending, criticism) as a barrier to activation. Level of education did not have significant correlation with perception of barriers and facilitators. RRT knowledge positively correlated with unit culture facilitators and RRT characteristics facilitators. RRT knowledge negatively correlated with unit culture barriers and RRT characteristics barriers.</td>
<td>Relatively small sample size for instrument testing.</td>
</tr>
<tr>
<td>3 Benin 2012</td>
<td>What are clinicians' attitudes/experiences regarding RRT</td>
<td>Qualitative</td>
<td>Semi structured interviews</td>
<td>49 participants: 18 RNs, 8 administrators, 6 attending physicians, 6 house staff, 4 RRT attendings, 4 RRT nurses, 3 RRT</td>
<td>Positive: RRT helped with morale, nurses felt supported by the RRT when RRT members take the time teach. Negative: Physicians felt undermined when nurses activated, some discouraged nurses from activating. Nurses felt the need to apologize to physicians for activating.</td>
<td>Single institution.</td>
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<td></td>
<td>Author</td>
<td>Research Question</td>
<td>Methodology</td>
<td>Participants</td>
<td>Findings</td>
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<tr>
<td>4</td>
<td>Brenten 2015</td>
<td>What are the institutional/system factors that shapes med/surg nurses' RRT activation behavior</td>
<td>Qualitative</td>
<td>12 med/surg RNs from a large urban nonteaching hospital in Colorado US</td>
<td>Willing to activate if: observed abrupt patient status changes, has objective data, senior nurse colleague confirms judgment/assessments, previous positive interaction with RRT, physician supportive Unwilling to activate if: subtle or gradual patient changes, fear of possible false alarm, fear of looking dumb or incompetent; want to handle on one's own, previous negative interaction with RRT (condescending, criticism, or not listening), physicians disapproval or criticism Not all believed in needing to strictly follow guidelines for activation</td>
<td></td>
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<tr>
<td>5</td>
<td>Douglas 2016</td>
<td>What are nurses and physicians perceptions of the RRT</td>
<td>Quantitative</td>
<td>434 RNs &amp; 190 MDs in a 929-bed teaching hospital in Queensland, Australia</td>
<td>Attitudes: 92% agreed RRS activation allows clinicians to seek help for patients when worried, nurses more strongly agreed than MDs. 70% RN would contact the physician before activating 14% RN unwilling activate the RRT if they could not contact physician first 56% RN would not activate the RRS if worried about a patient but VS are normal. 20% RN unwilling to activate if patient met activation criteria but doesn’t look unwell 17% RN unwilling to activate due to fear of criticism for false alarm 18% RN felt senior MD unsupportive of activating 82% respondents (RN and MD) disagreed that the RRS is not helpful 37% RNs and 12% MD agreed activation increases their workload, 14% RNs and</td>
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<td>Study</td>
<td>Year</td>
<td>Title</td>
<td>Design</td>
<td>Setting</td>
<td>Findings</td>
<td>Methodology</td>
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<tr>
<td>6</td>
<td>Jackson 2016</td>
<td>What are RNs beliefs and attitudes towards utilizing RRT</td>
<td>Quantitative</td>
<td>17 item Survey (Bagshaw 2006, modified)</td>
<td>163 RNs in a 295-bed community hospital in the Northeast US</td>
<td>Experience negatively correlated with unwillingness to activate. 71% RN unwilling to activate without contacting covering physician first. 79% willing to activate if unable to reach covering physician. 63% will to activate if worried but VS normal, 29% uncertain. 65% will to activate if patient met criteria but didn't look unwell. 86% disagreed that they would not call due to fear of criticism of inadequate nursing management.</td>
</tr>
<tr>
<td>7</td>
<td>Jenkins 2015</td>
<td>What are RNs perceived barriers and facilitators for RRT activation</td>
<td>Quantitative</td>
<td>Survey 32 item RRT Facilitators and Barriers Survey (RRT-FBS)</td>
<td>50 RNs in an urban community hospital in Midwestern US</td>
<td>Experience positive correlated with willingness to activate. Facilitators: Supportive unit culture, including nursing leader and colleagues, experience. Barriers: lack of experience, lack of knowledge of the RRT process.</td>
</tr>
<tr>
<td>8</td>
<td>Jones 2006</td>
<td>What are nurses’ attitudes</td>
<td>Quantitative</td>
<td>17 item Survey of</td>
<td>351 nurses in a large teaching</td>
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</tr>
<tr>
<td>#</td>
<td>Reference</td>
<td>Study Title</td>
<td>Methodology</td>
<td>Sample Size</td>
<td>Setting</td>
<td>Findings</td>
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<td>9</td>
<td>Kitto 2015</td>
<td>What are staff's experiences with the RRS, and what are factors mediating RRS usage</td>
<td>Qualitative Focus groups</td>
<td>27 physicians, 62 RNs in 10 focus groups across 4 hospitals in Australia</td>
<td>Criteria: did not report Who can activate: did not report Nurses: Viewed RRS as a preventative process by accessing greater support in patient deterioration Some missed activations are not really “missed” because local support was available Communication breakdown is a reason for missed calls Afraid of repercussions of “incorrect” calls, intimidated by more powerful RRT members, feel bad about calling for perceived legitimate reason. Nursing perceived to overcall, junior physicians perceived to under-call Junior nurse hesitate to call, would prefer to tell charge nurse, but also felt can empowering to be able to get physicians to the bedside Nurses call when they perceive physician managing patient inadequately</td>
<td>Did not report facilitators</td>
</tr>
<tr>
<td>10</td>
<td>Leach 2013</td>
<td>What is the perceived effectiveness of the RRS process</td>
<td>Qualitative: grounded theory Interviews and observations</td>
<td>17 clinicians including RNs, MDs, respiratory therapists, administrators at a large public teaching hospital</td>
<td>Facilitators: organizational culture supportive of staff, dedicated RRT nurse who covers outreach, nurse led-RRT, positive interaction and relationship development between RRT and floor RN, education on RRS process Barriers: poor interaction and relationship development between RRT and floor RN, poor education on RRS process</td>
<td>Single institution</td>
</tr>
<tr>
<td>11</td>
<td>Martland 2016</td>
<td>What is the communication process between floor clinicians</td>
<td>Qualitative Grounded theory Focus group</td>
<td>28 RNs in 4 focus groups, and 15 MDs in 3 focus groups at a large</td>
<td>Nurses reported increased willingness to activate using the “general concern criteria if MD orders are unclear regarding a potentially deteriorating</td>
<td>Single institution</td>
</tr>
<tr>
<td>#</td>
<td>Author</td>
<td>Year</td>
<td>Research Questions (RQ)</td>
<td>Methodology (RQ1)</td>
<td>Study Details (RQ2)</td>
<td>Results/Conclusions (RQ3)</td>
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<tr>
<td>12</td>
<td>Massey</td>
<td>2014</td>
<td>What are nurses experiences and perceptions in activating the RRS</td>
<td>Qualitative</td>
<td>15 RNs from 5 medical wards at a large teaching hospital in southeast Queensland, Australia</td>
<td>Unwilling to activate: fear of looking stupid, fear of being seen as over-reacting, fear of being reprimanded, frightened of consequences of making the wrong call, scared of the RRT, more comfortable asking the charge nurse, hope the patient will hang on a few more minutes, conflating cardiac arrest team and RRT activation.</td>
</tr>
<tr>
<td>13</td>
<td>Pastazopoulos</td>
<td>2012</td>
<td>What are factors influencing nurses' decision to activate medical emergency teams</td>
<td>Quantitative</td>
<td>94 registered nurses in Athens, Greece</td>
<td>Nurses knowledge of patient deterioration is influenced by nurses’ level of education (4 yr &gt; 2 yr) and previous attendance at BLS/ACLS training</td>
</tr>
</tbody>
</table>
| 14 | Shearer      | 2012 | What are the factors preventing staff from activating the RRS                           | Qualitative       | 44 RN and 29 MDs at a large teaching hospital in Melbourne, Australia, early establishment of RRS since 1996 | Point prevalence: 1.75% missed RRS activation 
RN: 41% felt they should be capable to manage on his/her own 
13% worried about hostile response from RRT or ward colleagues                                                                                                                                                                                                |
<p>| 15 | Stolldorf    | 2016 | What are the perceived benefits of the RRT                                              | Qualitative semi-structured interviews | 19 nurse leaders, 11 RRT RN members, and 20                                      | Willing to activate when felt the RRT is supportive and helpful, felt the patient will benefit                                                                                                                                                                                                 |
|    |              |      |                                                                                         |                   |                                                                                     | Did not consistently distinguish                                                                                                                                                                                                                                                                                                                                 |
| RRS to RRT users, nurse leaders, and RRT members | RRT users (RNs). (No MDs volunteered) at 4 community hospitals in the US | responses between nurse RRS users and other professions |</p>
<table>
<thead>
<tr>
<th>Author</th>
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<th>Measures</th>
<th>Sample</th>
<th>Findings</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson 2012 a</td>
<td>Scale development; a) Are individuals' personal sense of power relationship-specific? b) what are individuals' personal sense of power across different relationship types? (parent, dating, supervisor, teaching assistant) c) what is the relationship between individual's personal sense of power, sociometric status, and extraversion at the social peer group level d) What is the relationship between trait dominance and personal sense of power when interacting with a stranger? e) what is the relationship between personal</td>
<td>Quantitative</td>
<td>5-item Personal Sense of Power Scale (Anderson 2012)</td>
<td>a) 68 undergraduate students in a US university b) 143 undergraduate students in a US university c) 52 sorority members, and 70 college students living at a dorm at a US university d) 62 MBA students at a US university e) 4 samples: 77 undergraduate students, 145 MBA students, 316 undergraduate students and 206 undergraduate students</td>
<td>a) Individual's personal sense of power is relationship-specific b) no significant gender difference; individual's personal sense of power is coherent across different relationship types. Cronbach’s alpha = .76-.90 c) no significant gender difference; personal sense of power correlated with sociometric status; extraversion contributes to variance in personal sense of power; Cronbach’s alpha = .90 d) trait dominance contributes to variance in personal sense of power e) Cronbach’s alpha = .82-.85 across 4 samples. Personal sense of power negatively correlated with Machiavellianism. Positively correlated with narcissism, locus of control, conscientiousness, openness, and self-esteem. No correlations with tendency to value power, or agreeableness. Factor loadings/discriminant validity analysis indicated personal sense of power distinct from these potentially related concepts.</td>
<td>Small sample sizes for each study Limited to participants in university setting</td>
</tr>
<tr>
<td>Rank</td>
<td>Authors</td>
<td>Title</td>
<td>Study Design</td>
<td>Participants</td>
<td>Findings</td>
<td>Notes</td>
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<td>2</td>
<td>Anderson 2012 b</td>
<td>What is the effect of respect and admiration from one's peer social groups (sociometric status) on subjective well-being</td>
<td>Quantitative</td>
<td>Personal Sense of Power Scale (Anderson 2012); author-constructed sociometric status scale; author-constructed socioeconomic status index, social acceptance scale (Leary 1995); Satisfaction with life scale (Diener 1985)</td>
<td>315 individuals recruited from general public in the US</td>
<td>Sociometric status predicts personal sense of power, which in turn mediates social well-being</td>
</tr>
<tr>
<td>3</td>
<td>Choi 2014</td>
<td>What is the effect of personal sense of power on consumers’ perceptions and behaviors</td>
<td>Quantitative</td>
<td>Personal Sense of Power Scale (Anderson 2012); author constructed questions on intention to purchase</td>
<td>174 individuals recruited from general public in the US</td>
<td>Low personal sense of power makes participants more likely to purchase when promotion frame in dollars-off instead of percentage-off. No significant effect on high personal sense of power participants. Personal sense of power moderates effects of promotion frame of perceived savings and willingness to purchase.</td>
</tr>
<tr>
<td>4</td>
<td>Fast 2012</td>
<td>What is the relationship between personal sense of power and overconfident decision making</td>
<td>Quantitative</td>
<td>Personal Sense of Power Scale (Anderson 2012); author-constructed 4-item confidence scale</td>
<td>136 individuals recruited from general population in the US</td>
<td>Personal sense of power, but no mood, mediates the effect of objective power on overconfidence.</td>
</tr>
<tr>
<td>5</td>
<td>Joshi 2013</td>
<td>What is personal sense of power’s effect on personal sense</td>
<td>Quantitative</td>
<td>Personal Sense of Power Scale (Anderson 2012); Future Connection Scale (Husman &amp; shell 2008);</td>
<td>96 individuals recruited from general population in the US with annual income</td>
<td>Personal sense of power predicted connection to future self and total savings.</td>
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<tr>
<td></td>
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<td>financial savings behavior</td>
<td>Nursing Agency and Nurse Rapid Response Activation</td>
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<tr>
<td>6</td>
<td>Kim 2015</td>
<td>a) What is the relationship between trait self-control with personal sense of power b) What is the effect of ego depletion on personal sense of power c) what is the effect of construal level on personal sense of power</td>
<td>Quantitative</td>
<td>Personal Sense of Power Scale (Anderson 2012); trait self-control scale (Tangney 2004); b) Personal sense of power scale (Anderson 2012) c) Personal sense of power scale (Anderson 2012); author constructed construal-level score</td>
<td>ranging from $0 to &gt; 180,000</td>
<td>124 individuals recruited from general population in the US b) Ego depletion has negative effect on personal sense of power c) Construal level mediates ego depletion’s effect on personal sense of power</td>
</tr>
<tr>
<td>7</td>
<td>Lee 2014</td>
<td>What is the effect of personal sense of power on estimated weight of an object</td>
<td>Quantitative</td>
<td>Personal sense of power scale (Anderson 2012)</td>
<td>145 individuals recruited on a university campus</td>
<td>Personal sense of power negatively correlated with perceived weight of an object</td>
</tr>
<tr>
<td>8</td>
<td>Morrison 2015</td>
<td>What is the relationship between personal sense of power and employee’s likelihood to remain silent about issues at work (not speaking up)</td>
<td>Quantitative</td>
<td>Personal sense of power scale (Anderson 2012); Top Management Openness Scale (Ashford 1998); Tangirala (2008) silence scale</td>
<td>207 employees (nurses, medical assistants, administrative assistants, patient representatives) at a US healthcare facility</td>
<td>Personal sense of power negatively correlated with silence, but perceived target openness moderates the relationship</td>
</tr>
</tbody>
</table>
### Appendix F: Data Extraction Table Psychological Safety

<table>
<thead>
<tr>
<th>Author</th>
<th>Research Question</th>
<th>Method</th>
<th>Measures</th>
<th>Limitations</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Edmondsen 1999</td>
<td>What is the model of team learning behaviors that lead to team performance?</td>
<td>Qualitative</td>
<td>Field observations, semi-structured interviews</td>
<td>Presence of psychological safety has a positive impact on team performance.</td>
<td>Sample limited to healthcare settings.</td>
</tr>
<tr>
<td>3. Edmondsen 2000</td>
<td>What are the predictors of team performance?</td>
<td>Qualitative</td>
<td>Field observations, semi-structured interviews</td>
<td>Psychological safety is a predictor of team performance.</td>
<td>Sample limited to healthcare settings.</td>
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<tr>
<td>5</td>
<td>Leroy 2012</td>
<td>What factors are associated with nurses reporting errors in the hospital setting</td>
<td>Quantitative</td>
<td>7-item TPSS (Edmondson 1999); 5-item author constructed behavior integrity survey</td>
<td>580 RNs in 4 hospitals in Belgium; Psychological safety positively correlated with number of errors reported to head nurses; Psychological safety mediated relationship between leader behavioral integrity and reported errors</td>
</tr>
<tr>
<td>6</td>
<td>O'Leary 2016</td>
<td>What is the role of psychological safety on interprofessional teamwork at two healthcare facilities</td>
<td>Qualitative</td>
<td>Field observations and semi-structured interviews</td>
<td>25 care providers at 2 hospitals in Ireland; Psychological safety at different levels for two sites; Antecedents to psychological safety: Leadership behavior, team membership stability; Psychological safety is antecedent for: co-generation of knowledge, power sharing</td>
</tr>
<tr>
<td>7</td>
<td>Ortega 2013</td>
<td>What is the relationship between psychological safety, team learning behavior, task interdependence, group potency and team performance in hospitals</td>
<td>Quantitative</td>
<td>TPSS (Edmondson 1999); Team learning behavior scale (Edmondson 1999); Task interdependence scale (Van der Vegt 2001); Group potency Scale (Guzzo 1993); Team performance scale (Ancona &amp; Caldwell 1992)</td>
<td>488 staff in 89 nursing teams in 34 public hospitals in Spain; Team learning mediates between psychological safety, interdependence, group potency and team performance; Team size negatively correlated with team learning</td>
</tr>
<tr>
<td>8</td>
<td>Ortega 2014</td>
<td>What is the relationship between change-oriented leadership, psychological safety, team learning behavior, and team performance in hospitals</td>
<td>Quantitative</td>
<td>TRCA-13G (Yuki 2002); TPSS (Edmondson 1990); Team learning behavior scale (Edmondson 1999); Team performance scale (Ancona &amp; Caldwell 1992)</td>
<td>698 healthcare professionals in 107 teams at 37 public hospitals in Spain; Sequential mediating effect between change oriented leadership, psychological safety, team learning behavior, and team performance; Team size negatively correlated with team learning</td>
</tr>
<tr>
<td></td>
<td>Author/Year</td>
<td>Title</td>
<td>Study Design</td>
<td>Data Collection</td>
<td>Sample Size/Details</td>
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<tr>
<td>9</td>
<td>Schwappach 2013</td>
<td>What are the predictors of withholding voice (not speaking up when needed) in the healthcare setting</td>
<td>Quantitative</td>
<td>34 item survey including Employee silence scale (van Dyne 2003), TPSS (Edmondson 1999); other author-constructed items</td>
<td>1013 RNs, MDs, and allied health professionals at 8 hospitals in Switzerland</td>
</tr>
<tr>
<td>10</td>
<td>Wakeam 2014</td>
<td>What are factors associated with effective patient rescue and FTR</td>
<td>Qualitative</td>
<td>Semi-structured interviews</td>
<td>106 RNs, MDs, PAs, NPs at 4 high performing and 3 low performing hospitals in the US</td>
</tr>
<tr>
<td>11</td>
<td>Yanchus 2014</td>
<td>What are clinical providers' perceptions of communication in psychologically safe and unsafe environments</td>
<td>Qualitative</td>
<td>Semi-structured interviews</td>
<td>390 clinical providers (RNAs, MDs, DDS, Allied health) at 9 high psychological safety hospital and 6 low psychological safety hospital in the US VHA system</td>
</tr>
<tr>
<td>12</td>
<td>Yanchus 2015</td>
<td>What is the relationship between psychological safety, civility, procedural justice, autonomy, and job satisfaction to employee intent to turnover</td>
<td>Quantitative</td>
<td>VA All-Employee Survey (AES)</td>
<td>11,726 psychiatrists, psychologists, mental health RNs, social workers at the US VHA health system</td>
</tr>
</tbody>
</table>
Appendix G. Team Psychological Safety Scale

Please use the rating scale below to indicate how accurately each statement describes your experience working in your healthcare team. (1=very inaccurate, 2 = inaccurate, 3= somewhat inaccurate, 4= neither accurate or inaccurate, 5= somewhat accurate, 6 = accurate, 7= very accurate)

1. If you make a mistake on this team, it is often held against you.
2. Members of this team are able to bring up problems and tough issues
3. People of this team sometimes reject others for being different
4. If is safe to take a risk on this team
5. It is difficult to ask members of this team for help
6. No one on this team would deliberately act in a way that undermines my efforts
7. Working with members of this team, my unique skills and valued and utilized.
Appendix H. Personal Sense of Power Scale

Please use the following scale to rate each item below:

(1 = strongly disagree, 2 = disagree, 3 = disagree a little, 4 = neither agree nor disagree, 5 = agree a little, 6 = agree, 7 = strongly agree)

With my co-workers:

1. I can get them to listen to what I say
2. My wishes do not carry much weight
3. I can get them to do what I want
4. Even if I voice them, my views have little sway
5. I think I have a great deal of power
6. My ideas and opinions are often ignored
7. Even when I try, I am not able to get my way
8. If I want to, I get to make the decisions.
Appendix I. Modified Nurses’ Attitudes to the Medical Emergency Team Questionnaire

Please use the following scale to rate each item below:

(1 = strongly disagree, 2 = disagree, 3 = disagree a little, 4 = neither agree nor disagree, 5 = agree a little, 6 = agree, 7 = strongly agree)

1. I am willing to activate the rapid response team if I am worried about my patient.

2. I am willing to activate the rapid response team for a patient I am worried about, even if the vital signs are normal.

3. If my patient meets the rapid response team activation criteria but does not look unwell, then I am not willing to activate the rapid response team.
Appendix J. Demographics Questionnaire

Demographics data:

Age in years: _____ years

Gender:

- Male
- Female
- Non-binary/third gender

What is the highest degree in nursing you have completed?

- Diploma
- Associate’s degree in nursing
- Bachelor’s degree in nursing
- Master’s degree in nursing
- Doctorate in nursing (DNP, PhD, DNS)

How many years have you been practicing as a registered nurse? ____ years

Do you currently hold any certifications in a nursing specialty? Yes/No

   If yes, please specify: __________________________

Are you currently certified in Advanced Cardiac Life Support (ACLS)? Yes/No
Appendix K. Nurse RRS Activation Questionnaire

1. In the last 12 months, did you take care of at least one patient whom you felt needed to be seen by the rapid response team? (Yes/No)

2. If yes, in the past 12 months, have you called the rapid response team? (Yes/No)
Exemption Granted

04/16/2018

Grace Ng,
Hunter College

RE: IRB File #2018-0467

What is the relationship between psychological safety, nursing agency, and rapid response team activation?

Dear Grace Ng,

Your Exemption Request was reviewed on 04/16/2018, and it was determined that your research protocol meets the criteria for exemption, in accordance with CUNY HRPP Procedures: Human Subject Research Exempt from IRB Review (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation. You may now begin your research.

Please note the following information about your approved research protocol:

Expiration Date: 04/15/2021

Documents / Materials:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Version #</th>
<th>Date</th>
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<td>Grace Ng C11 certificate</td>
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<td>03/25/2018</td>
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<tr>
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<td>1</td>
<td>04/12/2018</td>
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Appendix L. IRB Approval Hunter College of the City University of New York (page 2)

Although this research is exempt, you have responsibilities for the ethical conduct of the research and must comply with the following:

**Amendments:** You are responsible for reporting any amendments or changes to your research protocol that may affect the determination of exemption and/or the specific category to the HRPP. The amendment(s) or change(s) may result in your research no longer being eligible for the exemption that has been granted.

**Continuing Review:** You are responsible for completing and submitting a continuing review form every three years. The information in this form will keep us up to date on the progress of the study and help to ensure that the study continues to meet the requirements for exemption.

**Final Report:** You are responsible for submitting a final report to the HRPP at the end of the study.

Please remember to:
- Use the HRPP file number 2018-0467 on all documents or correspondence with the HRPP concerning your research protocol.
- Review and comply with CUNY Human Research Protection Program policies and procedures.

If you have any questions, please contact:
Sarah Leon
212–650-3053
bleon@hunter.cuny.edu
Approval of Submission

March 22, 2018

On 3/22/2018 the IRB reviewed and approved the following submission:

<table>
<thead>
<tr>
<th>principal investigator</th>
<th>Ana Mola</th>
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<tr>
<td>study number</td>
<td>i17-01598</td>
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<td>study title</td>
<td>A TWO-CENTER SURVEY STUDY OF THE RELATIONSHIP BETWEEN PSYCHOLOGICAL SAFETY, NURSING AGENCY, AND NURSE RAPID RESPONSE TEAM ACTIVATION</td>
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<td>sponsor(s)</td>
<td>Name: Hospital Operations</td>
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| materials approved for use | • Personal Sense of Power Scale.pdf, Category: IRB Protocol;  
                          | • Modified Nurses Attitude to the Medical Emergency Team Questionnaire.pdf, Category: IRB Protocol;  
                          | • Email to Managers.pdf, Category: Recruitment Materials;  
                          | • Demographics Questionnaire.pdf, Category: IRB Protocol;  
                          | • Team Psychological Safety Scale.pdf, Category: IRB Protocol;  
                          | • Screening (internet).pdf, Category: Consent Form;  
                          | • Waiver of documentation of consent.pdf, Category: Consent Form;  
                          | • Protocol.pdf, Category: IRB Protocol;  
                          | • Nurse RRT Activation Questionnaire.pdf, Category: IRB Protocol;  
                          | • Recruitment Flyer.pdf, Category: Recruitment Materials;  
                          | • Recruitment email notification.pdf, Category: Recruitment Materials;  
                          | • Consent (internet).pdf, Category: Consent Form; |

Your study involves the selection of employees as research subjects. Before you can begin recruitment of nurses in this study, please contact Kimberly Glassman at Kimberly.Glassman@nyumc.org for further clearance.

The current IRB Status of your study is: Approved. This study was reviewed by the NYU School of Medicine’s Institutional Review Board (IRB). During the review of your study, the IRB specifically considered:

1. the risks and anticipated benefits (if any) to your subjects  
2. the selection of subjects  
3. the procedures for securing and documenting informed consent  
4. the safety of your subjects  
5. the privacy of your subjects and confidentiality of the data

Your study cannot commence until all ancillary review decisions are complete. To determine the state of all ancillary reviews, go the MyStudies page of this study in Research Navigator. Ancillary review statuses are located on the top/right area of your study’s main screen.
Note: Ensure that approval has been issued in MyAgreements/CRMS and the Clinical Research Support Unit (CRSU; formerly OCT) before you proceed with any aspect of this study, including the enrollment of human subjects.

Review Notes
For NIH Grant funded research; the IRB has found the IRB approved protocol referenced above to be consistent with the NIH grant application.

Sincerely,

[Signature]

RE: Study # 17-01598
Helen Panageas
Director, NYU SoM Institutional Review Board
Federalwide Assurance: FWA00004952

NYU School of Medicine's IRB operates in accordance with Good Clinical Practices (GCP) and applicable laws and regulations. Federal rules allow IRBs to document their determination/authorization process in their policy manual. Determination letters generated by NYU SoM's IRB administration system are not physically signed as per policy. All approved study materials are clearly identified and locked in each study submission record within the IRB's administration system.

NYU School Of Medicine IRB Policy
- All current IRB policy documents can be found on our website: http://irb.med.nyu.edu
- You must submit all modifications to this study (e.g., protocol updates, modified recruitment materials, consent forms, etc.) using Research Navigator to communicate with the IRB (eSubmission) for review and approval prior to initiation of those change(s), except where necessary to eliminate apparent immediate hazards to the subject(s).
- Changes made to eliminate apparent immediate hazards to subjects must be reported to the IRB within 24 hours.
- All adverse and/or unanticipated event(s) that occur while conducting the study must immediately be reported to the IRB via eSubmission.
- You may only use IRB-approved copies of your consent form(s), questionnaire(s), letter(s), assignment(s), etc. in your study. Never use expired consent forms.
- If modifications are made to the study or adverse events occur while conducting study, the PI must inform all research staff listed on this study.
- IRB's approval is valid until the end date of the performance period indicated above. A reminder to submit a continuation should be e-mailed to the PI, PI Proxy and Primary Contact 90, 60 and 30 days prior to this study's expiration date. However, the PI is solely responsible for submitting all continuation materials at least eight weeks prior to expiration, regardless of whether you receive a reminder notice.
- Prior to initiating an IRB-approved study, you must receive written approval from an authorized representative for each site where your study will take place. Key contacts are:
  - Bellevue Hospital: when Bellevue Hospital is listed as a site where your study takes place, note that you may have to complete additional work in BHC’s Reason system. Bellevue will be contacting you with any additional needed information. For questions on Bellevue Hospital research, please contact BellevueResearch@bellevue.nyc.edu
  - CTSI - Clinical and Translational Science Institute, NYU School of Medicine (formerly General Clinical Research Center (GCRC)); email ctsi@nyumc.org
  - NYU Langone Health Centers (Tisch Hospital/Rusk Institute/Co-op Care/JJD/Perlmutter Cancer Center) site approval is handled for you automatically (as needed) by the CRSU
  - The IRB may terminate studies that are not in compliance with NYU Langone Health/School of Medicine Policies & Procedures and the requirements of the Institution’s Federal Wide Assurance with the federal government.
  - Direct IRB questions and comments to 212-263-4110 or IRB-INFO@nyumc.org
Email to Nurse Managers Seeking Permission to Conduct Research Study

Title of Research Study: What is the relationship between psychological safety, nursing agency, and rapid response team activation?

Principal Investigator: Grace M. Ng, MS, RN, CNM
PhD candidate, Nursing PhD Program, the Graduate Center, The City University of New York

Faculty Advisor: Donna Nickitas, PhD, RN, NEA-BC, CNE, FAAN
Executive Officer and Professor, Nursing PhD Program, the Graduate Center, The City University of New York

Re: Permission to Conduct Research Study

Dear Nurse Manager,

I am Grace Ng, a nurse at NYU Langone Health. I am pursing a PhD in nursing at the CUNY Graduate Center. I am writing to request permission to conduct a research study on your nursing unit. The principal investigator of this study is Ana Mola, also a nurse at NYU Langone Health. The study is titled “The relationship between psychological safety, nursing agency, and nurse rapid response team activation.” The purpose of the study is to better understand whether a psychologically safe environment is related to nurses calling the rapid response team when patients exhibit signs of deterioration. It is an online survey study approved by the NYU Langone Health IRB, study number 17-01598, and CUNY Hunter College IRB, study number 2018-0467.

I hope to recruit registered nurses with one year or more experience on your unit for this study. Interested nurses who volunteer to participate will be asked to provide online consent, and complete an anonymous online survey. Nurses will be asked to complete the survey on their own time. The process should take no longer than 20-25 minutes. The survey results will be pooled and individual responses will remain absolutely confidential and anonymous. No cost will be incurred by either your unit, individual participants, or the hospital. Nurses will not receive compensation for participating in the study. With your approval, I will email nurses on your unit, as well as distribute recruitment flyers, to recruit them for this study and provide them with the link to the online consent and survey.

Your approval to conduct this online study will be greatly appreciated. The nurses’ opinions can potentially help improve patient safety and nurse working environment in hospitals. I would be happy to answer any question or concerns you may have. Please feel free to contact me at gng@gradcenter.cuny.edu, or at 646-501-4010.

If you agree, please kindly reply to this email to indicate your approval.

Thank you!

Sincerely,

Grace Ng, PhD(c), MS, RN, CNM
Recruitment Email

Title of Research Study: What is the relationship between psychological safety, nursing agency, and rapid response team activation?

Principal Investigator: Grace M. Ng, MS, RN, CNM
PhD candidate, Nursing PhD Program, the Graduate Center, The City University of New York

Faculty Advisor: Donna Nickitas, PhD, RN, NEA-BC, CNE, FAAN
Executive Officer and Professor, Nursing PhD Program, the Graduate Center, The City University of New York

Dear Registered Nurse:

I am Grace Ng, a nurse at NYU Langone Health. I am pursuing a PhD in Nursing at the CUNY Graduate Center. I am writing to invite you to participate in my research study titled “The relationship between psychological safety, nursing agency, and rapid response team activation.” The principal investigator of this study is Ana Mola, also a nurse at NYU Langone Health. We obtained permission from nursing administration to contact nurses for participation in this research. The purpose of the study is to better understand whether a psychologically safe environment is related to nurses calling the rapid response team when patients exhibit signs of deterioration. Your opinions can potentially help improve patient safety and nurse working environment in hospitals.

You may be eligible if you are a staff nurse with one year or more nursing experience, and you work on a unit that calls the rapid response team for patient emergencies. Eligibility will be confirmed by answering screening questions. If you’re eligible, you will be asked to complete a 15-20 minute online survey. Participation is voluntary and your answers will be anonymous and confidential. Participation or non-participation in this research study will not affect your employment, your position at the hospital, or your benefits. There is no cost for participation in this study. If you agree to participate in this research, you will not receive compensation for your time.

If you would like to hear more about this study, please contact me at gng@gradcenter.cuny.edu, or call 646-501-4010.

If you are interested in participating, please click on this link: https://is.gd/RRTNurseStudy

The link will take you to the electronic consent page. There is no obligation to participate if you click on the link. This study received NYU Langone Health IRB approval Protocol i17-01598, and CUNY IRB approval Protocol 2018-0467.

Thank you!

Sincerely,

Grace Ng, PhD(c), MS, RN, CNM
THE CITY UNIVERSITY OF NEW YORK
Hunter College
Hunter-Bellevue School of Nursing

ORAL OR INTERNET BASED INFORMED CONSENT SCRIPT

Title of Research Study: What is the relationship between psychological safety, nursing agency, and rapid response team activation?

Principal Investigator: Grace M. Ng, MS, RN, CNM
PhD candidate, Nursing PhD Program, the Graduate Center, The City University of New York

Faculty Advisor: Donna Nickitas, PhD, RN, NEA-BC, CNE, FAAN
Executive Officer and Professor, Nursing PhD Program, the Graduate Center, The City University of New York

Dear Registered Nurse:

You are invited to participate in this research study titled “The relationship between psychological safety, nursing agency, and rapid response team activation” because you are a nurse currently working at NYU Langone Health on units that use the rapid response team. The principal investigator of this study is Ana Mola, also a nurse at NYU Langone Health. The purpose of this research study is to better understand whether a psychologically safe environment is related to nurses calling the rapid response team when patients exhibit signs of deterioration.

Participation:

Your participation in this research study is voluntary. If you agree to participate, we will ask you to complete a screening questionnaire to confirm your eligibility. If you are eligible and interested to participate, we will ask you to complete a demographics form and an online survey that will take 15-20 minutes to complete. The survey will include questions on your experience working as a nurse in your unit.

Your decision whether or not to participate or withdraw/stop completing surveys will not affect your job, your position in the hospital, or any benefits to which you are otherwise entitled.

Privacy and Confidentiality:

We will not ask you for your name or any other identifying information. Your survey responses will be anonymous, with no identifying information linking the responses to the participants. We will group all the answers together, and there will be no way to identify individual responses. Your survey answers will be stored in REDCap, a web-based survey tool, in a password protected electronic format, only the researcher will have access to the anonymous data.

Benefit and Risks:

You will receive no direct benefit from participating in this research study, however, we hope your opinions may help improve work environments for nurses in the future.
Appendix P. Study Consent Form (page 2)

The risks associated with this study are psychological discomfort, and the possibility of loss of confidentiality if your data or information is inadvertently disclosed outside of this study. Some of the questions may make you feel uncomfortable answering them. You may refuse to answer any questions that you do not want to answer and still remain in the study. If you do not wish to answer a question, you can skip it and go to the next question. You can also withdraw from the study by exiting survey at any time, without any penalty. To minimize the risk of loss of confidentiality, the researchers will not collect any identifiable information about you. All the research data will be stored and maintained in a password protected computer. Only the researchers will have the password.

Contact:

If you have any questions, you can contact the site Principal Investigator Ana Mola at ana.mola@nyumc.org, or the researcher Grace Ng at gng@gradcenter.cuny.edu.

Donna Nickitas is Grace Ng’s faculty advisor for this study, she can also be contacted at dnickita@hunter.cuny.edu. If you have any questions about your rights as a research participant, or if you would like to talk to someone other than the researchers, you can contact the NYU Langone Health Institutional Review Board (IRB) at 212-263-4110, or the CUNY Research Compliance Administrator at 646-664-8918.

Consent:

Please select your choice below. You may print out a copy of this consent for your records.

Clicking on the “I agree to participate” button indicates that:

- You have read the above information
- You voluntarily agree to participate

Clicking on the “I don’t agree” button indicates that you do not wish to participate. We thank you for your time.

If you agree to participate, and would like to proceed to the screening page to confirm your eligibility, please click on the “Proceed to Screening” button below.

If you would not like to proceed to the screening page, you can simply close the browser. We thank you for your time.

[Insert “Proceed to Screening” here]
Thank you for your interest in our study.

We would like to ask you a few questions to determine whether you are eligible to participate in this research study. The screening will take about 2-5 minutes. Your participation in the screening is voluntary. You do not have to answer any questions you do not wish to answer, and you may stop at any time.

Confidentiality:

We will keep your answers confidential. No one except for the researchers will have access to your answers. If you are not eligible for the study, your answers will be destroyed. If you are eligible to for the research, your answers will be kept with the research record. Your answers will be anonymous, and will not be linked to participants. If you would like to continue with the screening, please proceed to answer the questions below. If not, simply close your browser, and I sincerely thank you for your interest and time.

Questions about the study:

If you have any questions about the screening or the research, you may contact Grace Ng at gng@gradcenter.cuny.edu, or call (646) 501-4010. If you have questions about your rights as a research participant, or if you wish to voice any problems or concerns to someone other than the researchers, please call the NYU Langone Health Institutional Review Board (IRB) at 212-263-4110, or the CUNY Research Compliance Administrator at 646-664-8918.

Please respond to the following questions:

1. How long have you been working as a nurse?
   - Less than one year
   - One year or more

2. Do you currently work on a unit that calls the rapid response team (RRT) for patient emergencies?
   - Yes
   - No
   - Not sure
3. What is your role on your unit?
   - Staff nurse
   - Assistant nurse manager, nurse manager, nurse educator, or clinical nurse specialist
   - Other

If participant is eligible:

You meet the eligibility requirements for this study. If you would like to participate in the study, please click on the “Continue to Survey” button to proceed to the survey. If you would not like to continue, simply close your browser, and we thank you for your time.

If participant is not eligible: I am sorry. You do not meet eligibility requirements for this study. We sincerely thank you and appreciate your time.
Nursing Agency and Nurse Rapid Response Activation

References


Nursing Agency and Nurse Rapid Response Activation


Nursing Agency and Nurse Rapid Response Activation


https://doi.org/10.1097/CCM.0000000000000767


Nursing Agency and Nurse Rapid Response Activation


https://doi.org/10.1177/0894318410389060


Nursing Agency and Nurse Rapid Response Activation

Hospital Mortality, Morbidity, and Length of Stay in a Tertiary Care Institution. *Critical Care Medicine, 44*(1), 54–63. https://doi.org/10.1097/CCM.0000000000001346


Nursing Agency and Nurse Rapid Response Activation


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https://doi.org/10.1097/CCM.0000000000000038


https://doi.org/10.5465/AMJ.2011.61967925


https://doi.org/10.1097/01.CCM.0000235743.38172.6E


https://doi.org/10.1097/NCQ.000000000000139
Nursing Agency and Nurse Rapid Response Activation


Nursing Agency and Nurse Rapid Response Activation

*Organizational Behavior, 1*(1), 23–43. https://doi.org/10.1146/annurev-orgpsych-031413-091305


Nursing Agency and Nurse Rapid Response Activation


https://doi.org/10.3109/01612840903200068


https://doi.org/10.1111/j.1466-7657.2009.00767.x

Nursing Agency and Nurse Rapid Response Activation


Nursing Agency and Nurse Rapid Response Activation


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Nursing Agency and Nurse Rapid Response Activation


https://doi.org/10.1002/nur.20316


https://doi.org/10.1177/1077558707299253


https://doi.org/10.4037/ajcc2013990


https://doi.org/10.4037/ajcc2013990


https://doi.org/10.1371/journal.pone.0172455


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Nursing Agency and Nurse Rapid Response Activation

https://doi.org/10.1007/s10869-013-9315-8


https://doi.org/10.1097/01.NAJ.0000398045.00299.64
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Service Organizations: Management, Leadership & Governance, 39(3), 219–244.

https://doi.org/10.1080/23303131.2015.1014953