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Case Analysis of Acute Care Guidelines for the Prevention of Pressure Ulcers

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2020

Abstract

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by

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MHA, Walden University, 2013

BS, Millsaps College 1972

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Prevention of pressure ulcers (PUs) in acute care settings is an attempt to avoid adverse events (AE). Literature shows that wounds such as PUs are the most prevalent complication for spinal cord injury patients (SCI) including quadriplegic individuals (QI). SCI and QI bring important pressure ulcer (PU) prevention knowledge to the hospital which involves teamwork and participation by nurses, organizations, and patients. The purpose of this qualitative study was to examine the effectiveness of acute care guidelines for PUs by drawing insights from multiple sources including interviews with QI, healthcare clinicians, care providers, family members, and an online search of secondary data. Support for the study was the theory of protocol-based care (PBC) developed by Pawson & Tilley, which states standardization of patient care follows the constructs of mechanism and context affecting outcome. The focus of the research questions was to determine the extent mechanisms like PU prevention in acute care settings affected the outcome of PUs and how context of program execution led to an outcome of a secondarily-acquired wound. This qualitative case study captured perspectives about the effectiveness of PU prevention guidelines. All data were analyzed in depth to formulate significant conclusions on the PU issue. The results showed the PU prevention guidelines are efficient and a primary defense for preventing a PU. However, the main finding was the PU prevention guidelines were not always executed properly for vulnerable patients like QI. Positive social change is promoted by highlighting the health needs of SCI patients and insights into PU prevention with a goal of reducing development of PUs, thereby improving the quality of life for high-risk patients by avoiding unnecessary AE.

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Dedication

This dissertation is dedicated to my wife Kelly Ray, my daughter Fiona Ray, and my son Sean Broad. Each of them provided support and encouragement throughout this journey.

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Above all I would like to than my wife Kelly Ray for believing in me and giving me the support to complete the PhD journey.

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Chapter 1: Introduction to the Study

Introduction

Spinal cord injury patients (SCI), quadriplegic individuals (QI), the elderly, and those who have been sedated after surgery are at high risk for the development of wounds called pressure ulcers (PUs) while in acute care settings such as hospitals and nursing homes (Agency for Healthcare Research and Quality [AHRQ], 2016; Kim, Ahn, Lyon, & Stechmiller, 2016; Kryczka & Grieb, 2014). PUs occur when immobility leads to pressure on bony prominences of the body (AHRQ, 2016; Edsberg, Black, Goldberg, & Seiggreen, 2016; National Pressure Ulcer Advisory Panel [NPUAP], 2014a; Stansby, Avital, Jones, & Marsden, 2014); therefore, acute care guidelines have been established to help prevent PUs (AHRQ, 2016; NPUAP, 2014a). Additionally, researchers assert that SCI and QI, which is one classification of SCI, have important knowledge that could impact the delivery of pressure ulcer (PU) prevention techniques which will help to diminish these adverse events (AE) in the healthcare system (Latimer, Chaboyer, & Gillespie, 2014; Marin, Nixon, & Goreki, 2013; McInnes, Chaboyer, Murray, Allen, & Jones, 2014). This qualitative case study aims to evaluate prevention guidelines for PUs from the perspective of QI experiences in acute care settings and various sources of data including archival records or secondary data gathered related to hospital PU history, quality of care, staff training, and facility ratings (see Creswell, 2009), as well as medical records and photographs to document description of participant information. These ideas may impact social change by preventing AE, relieving pain and suffering for high-risk individuals, and reducing related economic implications in healthcare delivery.

In Chapter 1, I will provide detail about the background of the study including a summary of the literature, description of the gap, and an explanation of why the research is needed. The problem statement explains the issues that exist concerning PUs in acute care settings and describe trends, probable causes, and major concepts. The purpose of the study is to evaluate PU prevention guidelines used in acute care settings from the perspective of QI and various sources of data based on the fact that SCI, including QI, were inadequately represented in the formulation of protocol. The research questions will provide focus for evaluation of acute care guidelines by asking how PU prevention is executed in relation to circumstances that lead to outcomes. Protocol-based care theory (PBC) underlines this study and will answer the research questions during this analysis; because, PBC is characterized by the idea mechanisms or protocols in healthcare will succeed or fail because of execution, depending on contexts or circumstances that help create outcomes (Pawson & Tilley, 2004; Rycroft-Malone, Fontenla, Bick, & Seers, 2010). Therefore, the theoretical framework and supporting theory in this study will be used to outline the mechanisms involved in PU development and depict elements within the context of acute care settings that lead to outcomes related to secondarily-acquired wounds (Pawson & Tilley, 2004; Rycroft-Malone et al., 2010). The qualitative nature and methodology guiding the research will be discussed to show the validity of the case study approach for examining the PU topic from the QI perspective and other sources of data that will be collected. Definitions of key concepts and constructs will clarify terminology related to PU prevention and development. I will outline assumptions describing concepts that exist but cannot be proven. The scope and delimitations will address boundaries and

populations which are addressed in the study, theories included and excluded, as well as transferability; while, the limitations will assert the strengths and weaknesses, including factors of bias. Finally, the significance of the study will state the impact of new viewpoints on healthcare related to a holistic approach for PU prevention protocol that may lead to social change for the community and the QI population through fewer AE in acute care settings. A summary will give an overview of the chapter and transition to the detailed examination of the study to follow.

Background

There are various individuals who are at high risk for PUs, including SCI, QI, the elderly, intensive care patients, and those who have been sedated (Ackroyd-Stolarz, Bowles, & Giffin, 2014; Johansen, Bakken, & Moore, 2015). SCI and QI are impacted the most by immobility, which can cause pressure on bony prominences and may eventually lead to the development of PUs (AHRQ, 2016; NPUAP, 2014a; Stansby et al., 2014). Furthermore, PUs that occur for patients in acute care settings are included in a list of AE established by The Centers for Medicare and Medicaid (AHRQ, 2016; Thomas & Compton, 2014; US Food and Drug Administration [FDA], 2014). Overall, it has become a priority for the healthcare system to prevent AE including PUs to improve quality in acute care settings (Black et al., 2015; Rafter et al., 2014; Zaratkiewicz et al., 2011).

There are a variety of reasons why SCI, which includes QI, are susceptible to PUs, such as age, degenerating body systems, and length of time of injury (Jensen et al., 2013); however, immobility remains the highest risk factor for PUs in the SCI population (Ackroyd-Stolarz et al., 2014). Therefore, SCI are especially vulnerable and at risk for

PUs in acute care settings (Gillespie et al., 2014). Guidelines were established to help prevent PUs and other secondarily-acquired wounds in the acute care environment with a goal of diminishing this adverse event for all high-risk patients (CDC, 2015; AHRQ, 2016). However, the prevalence of secondarily-acquired wounds like PUs occurring in acute care settings continues to severely impact healthcare in the United States and internationally (Ackroyd-Stolarz et al., 2014; Black et al., 2015). The occurrence of PUs in hospitals and nursing homes not only influences healthcare economics (Bruce, Shever, Tschannen, & Gombert, 2012), but the effect on individuals like SCI, QI, surgical patients, the elderly, and others is expressed as physical pain, disruption of lifestyle, and even death (Eslami et al., 2012; Rafter et al., 2014). Ultimately, it has been established that the best prevention for PUs incorporates clinically sound, cost effective intervention executed as a multi-component approach of standardization and multidisciplinary teamwork which utilizes patient feedback (Qaseem, Tanveer, Starkey, & Denberg, 2015).

Initially, patients are screened when they enter an acute care setting. High-risk patients are evaluated for PUs according to assessment tools such as the Braden Scale, the Norton Scale, the Gosnell Scale, and the Waterlow Scale (Braden & Bergstrom, 1994; Thom, Smith, Aziz, & Holme, 2013; Torra i Bou, Garcia-Fernandez, Pancorbo-Hidalgo, & Furtado, 2006). In the United States, the Braden Scale has become the standard for PU risk evaluation (Hyun, S. et al., 2013; Torra i Bou et al., 2006; Warner-Maron, 2015). These scales review items such as body mass, sensory perception, age, mobility, moisture, and nutrition (Braden & Bergstrom, 1994; Thom et al., 2013; Torra i Bou et al., 2006). These assessment scales are used to categorize PUs in stages of Stage I, Stage II,

Stage III, Stage IV, and unstageable (AHRQ, 2016; CDC, 2015; Cox, 2011). Each stage increases in seriousness with Stage III, Stage IV, and unstageable involving full tissue loss, exposure of bone, and the presence of yellow, tan, green, or brown substance (AHRQ, 2016; CDC, 2015; Cox, 2011).

If a patient is diagnosed with a PU upon admission to an acute care setting, the first line of prevention is to protect the area and to relieve the pressure (Bandeira et al., 2014; Johansen, Bakken, & Moore, 2015; Schofield, Porter-Armstrong, & Stinson, 2012; Sullivan, 2013). Repositioning by turning the patient every 2 hours to relieve pressure from impacted areas has been proven to be the most effective means of prevention (Johansen et al., 2015; Sullivan, 2013). Existing PUs may indicate infection, so lab tests are done to determine which bacteria are present and whether antibiotics are necessary (AHRQ, 2016; CDC, 2015). The care team will use debridement or remove tissue and use surgical procedures when necessary (AHRQ, 2016; CDC, 2015). Also, it has been indicated that standardization of care and patient-provider cooperation can prevent AE like PUs (Bandeira et al., 2014; Latimer et al., 2014; McInnes et al., 2014). Therefore, staffing issues are a major concern for the execution of PU prevention guidelines in acute care settings (Cooper, 2013; Dunton, Gajewski, Klaus, & Pierson, 2007).

SCI and QI use a daily routine of hygiene and prevention in order to maintain optimal health (Frazier Rehab Institute [FRI], 2013; Ghavam, Noorbala, & Rahimina, 2014; Hammell, 2007). SCI and QI are also vulnerable to bowel and bladder problems, muscle spasms, and infections (Jensen et al., 2013; Sezer, Akkus, & Uğurlu, 2015). Part of a daily routine for SCI and QI is the execution of repositioning and use of specialized

equipment to prevent PUs (FRI, 2013; Gefen, 2014). Due to immobility, this population is at an extreme high risk for secondarily-acquired wounds like PUs in acute care settings (DeJong et al., 2013). Additionally, SCI and QI experience psychosocial elements related to their condition, and admission to an acute care setting can cause anxiety and stress over the possible development of secondarily-acquired wounds like PUs (Ghaisas, Pyatak, Blanche, Blanchard, & Clark, 2015; Munce et al., 2014).

Prevention guidelines for PUs were established to help diminish these AE in acute care settings and the community (AHRQ, 2016; Black et al., 2015; NPUAP, 2014a; Stansby et al., 2014; Thomas & Compton, 2014). Latimer et al. (2014) believe that SCI and QI have important prevention knowledge, and McInnes et al. (2014) add that cooperation between hospital staff and patients can improve the prevention of PUs and AE. Additionally, Marin et al. (2013) have cited a gap in the literature in which SCI, which includes QI, were not adequately recognized during the development of PU acute care guidelines; so, this qualitative case study is necessary to re-evaluate prevention guidelines from the SCI and QI perspective in order to obtain a new view of secondarily-acquired wounds, influence protocol surrounding execution of acute care techniques, and act as a catalyst for future research on the topic, which may ultimately impact quality in healthcare.

Problem Statement

Prevention of decubitus ulcers or PUs in acute care settings is an attempt to avoid AE, serious complications, hospitalization, surgical procedures, or even death (AHRQ, 2016; Kim et al., 2014). PU affects 3 million adults in the United States (Smith et al.,

2013). Those affected the most are SCI, the elderly, and individuals sedated after surgery (Ackroyd-Stolarz et al., 2014; Johansen et al., 2015). Although new procedures are present in operating rooms and intensive care, not much progress has been made toward sustainable prevention of PUs in the past 20 years for high-risk patients (Black et al., 2015). Categories of PUs are rated as (a) Stage I or no open wounds, (b) Stage II or a painful open abrasion, (c) Stage III or extending into tissue, (d) Stage 4 or reaching deep into muscle and bone, and (e) unstageable or full tissue loss with depth undeterminable due to slough and eschar (AHRQ, 2016; Edsberg et al., 2016; NPUAP, 2014a; Stansby et al., 2014). All PUs acquired in a hospital are AE, but "never events" (NE) which include Stage III and Stage IV pressure wounds have been categorized as preventable and are part of The Centers for Medicare and Medicaid Services expanded list of cases in which payees will not receive payment as of 2007 (AHRQ, 2016). AE in healthcare are defined as unintended harm, and serious AE (SAE) involve death, prolonged inpatient hospitalization, and significant incapacity (FDA, 2014; Thomas & Compton, 2014). Rafter et al. (2014) have stated that upon national review, at least 10% of hospital admissions appear to be associated with AE. Permanent disability or even death may be caused by AE, but 43% are preventable (Rafter et al., 2014). PUs commonly occur in hospitals with an incidence rate of 0.4% to 38% in acute care settings highlighted by prevalence variability based on lack of standardization of data collection (Black, Brindle, & Honaker, 2015), but researchers have shown that up to 60% of new pressure ulcers develop during hospitalization (Ackroyd-Stolarz et al., 2014). From 1993 to 2006, improved reporting on AE and NE show hospitalization is up 86.4% related to secondary

diagnoses like PUs (Zaratkiewicz et al., 2011). In 2007, Centers for Medicare and Medicaid reported 257,412 cases of Stage III and Stage IV hospital acquired PUs, but the number may be underestimated due to faulty discharge data (Zaratkiewicz et al., 2011). PUs annually cost the healthcare system $9.1 billion to $11 billion in treatment, rehospitalization, and malpractice suits (Bruce, Shever, Tschannen, & Gombert, 2012). Estimated costs average $127,000 per ulcer due to delayed healing and long-term care (Brem et al., 2010), and Chan et al., 2013) state that community dwelling SCI with PUs cost the healthcare industry $4,745 monthly. According to Eslami et al. (2012), PUs affect up to 85% of the high-risk SCI population, creating serious complications and AE.

PU development is accelerated by immobility (Ackroyd-Stolarz et al., 2014), and AE like secondarily-acquired wounds including PUs are the most prevalent complication in acute care settings for SCI, which includes QI (Clark et al., 2014). Additionally, complications occur for SCI and QI related to factors such as age, degenerating body systems, and length of time of injury (Jensen et al., 2013). Patient surveys have indicated mobility, skin care, and diet are beneficial preventative measures (Gillespie, Chaboyer, Sykes, O'Brien, & Brandis, 2014), but Marin et al. (2013) stated not all risk factors for the prevention of PUs have been identified. The complexity of PU development will require a more reliable assessment of risk factors; because information is limited depicting patient views on preventive measures in hospitals (Coleman et al., 2013). This current study aims to address this limitation. According to McInnes et al. (2014), PU prevention will benefit from patient and clinician joint participation about management of pain, communication, and ongoing education. SCI and QI bring important pressure ulcer

knowledge to the hospital, which can be utilized as prevention strategies involving teamwork and participation by nurses, organizations, and patients (Latimer et al., 2014). However, McInnes et al. (2014) have recognized factors inhibiting patient participation that could evolve into a new understanding of existing PU prevention guidelines. Furthermore, the perspective of high-risk populations is significant. According to Marin et al. (2013), a gap exists in the literature calling for further research on PU prevention guidelines; because the researchers recognized a failure to adequately represent SCI patients, which includes QI, in the formulation of strategies to prevent PUs (Marin et al., 2013).

Purpose of the Study

The purpose of this qualitative study is to examine the effectiveness of acute care guidelines for the prevention of PUs in quadriplegic individuals (QI) by drawing insight from various sources of data. According to Marin et al. (2013), persons diagnosed with SCI, which includes QI, were underrepresented in the formulation of PU prevention strategies. Also, information is limited about patient views on pressure ulcer development during episodes of care (Coleman et al, 2013). Therefore, the study will allow QI participants to speak about prevention of PUs by using their unique perspective and insight concerning the effectiveness of existing acute care guidelines during episodes of care in order to further enlighten healthcare workers, patients, and family members with the goal of preventing AE (Rafter et al., 2014).

Research Questions

Research Question 1 (RQ1): To what extent does the mechanism of pressure ulcer prevention in an acute care setting prevent the outcome of wound development?

Research Question 2 (RQ2): How does the context associated with an episode of care impact the mechanism of pressure ulcer prevention initiated in the acute care setting?

Framework

The theory of protocol-based care (PBC) will provide support for the perspective of QI and various sources of data used to evaluate the effectiveness of PU prevention guidelines. PBC was developed by the National Health Service in the United Kingdom as a mechanism for modernization and standardization of patient care (Rycroft-Malone et al., 2010). The main construct of PBC is standardization of care related to mechanism and context affecting outcome through awareness and change (Chandler et al., 2013). According to Pawson & Tilley (2004), programs are theories, and mechanisms bring about affects, while context expresses the circumstance of a program leading to outcome. These constructs are the framework for PBC which develops interventions by an assumption that this logical model aligns with introduction of practices and guidelines (Rycroft-Malone et al., 2010).

Hospitalization and prevention of PUs are a daily risk factor for QI, who are the focus of this study (Marin et al., 2013), and their routine requires a program to prevent pressure wounds (Rycroft-Malone et al, 2010). Rycroft-Malone, Fontenla, Bick, & Seers (2007) state PBC sufficiently examines programs or guidelines on patient care issues

such as surgery, stroke, and PUs. According to Bentler, Morgan, Virnig, and Wolinsky (2014), preventable hospitalization and emergency room treatment is improved by continuity of care or standardization (Chandler et al., 2013); furthermore, Bentler et al. (2014) state healthcare reform should include a patient-provider experience or perspective to lower the risk of rehospitalization or mortality, which supports this study. The PBC model for standardization of PU prevention is set forth as acute care guidelines (AHRQ, 2016) and suggested as a mechanism for assessing risks (see Rycroft-Malone et al., 2010) or prevention technique (AHRQ, 2016). The aim of the model is to achieve a positive outcome within all contexts or circumstances (Rycroft-Malone et al., 2010). PBC is associated with theory-driven evaluation because social programs reflect human imagination for societal improvement accenting behavioral deficiencies and inequalities to be alleviated (Pawson & Tilley, 2004). In Chapter 2, the literature review will analyze the mechanism, context, and potential outcome of PU occurrence supported by PBC when these concepts are executed in acute care settings. These constructs will show how PBC, along with evidence-based use of PU prevention guidelines and standardization, can improve outcome for QI in acute care settings such as hospitals and nursing homes. These concepts will be explained in Chapter 2 by outlining prevention guidelines in the context of acute care settings using current literature to explain mechanisms of PU causes, prevention, and treatment in an effort to achieve evidence-based standardization that may lead to a higher quality of care and a positive outcome (see AHRQ, 2016; Rycroft-Malone et al., 2010). Healthcare priority is to improve outcome (Goldberg, 2014) that supports change, creating a positive performance (Mayne, 2008), which realistic

evaluation by PBC can achieve (Pawson & Tilley, 2004). PBC examines standardization, including the decision-making process of clinicians (Rycroft-Malone, Fontenla, Seers, & Bick, 2009). Subsequently, PBC theory-driven evaluation (Chandler et al., 2013) created from the perspective of QI on PU prevention mechanisms may facilitate protocol or contexts and ultimately improve outcomes.

The theory of PBC relates to the study approach by analysis of the PU prevention mechanism or guideline program compared to outcomes. The study approach reviewing perspective of QI about behaviors and actions surrounding the execution of PU guidelines experienced in acute care settings will be used to answer the research question of how the mechanism of prevention relates to the outcome of pressure ulcer development. The theory of PBC evaluates context and relates to circumstances that exist in acute care settings. The study approach utilizes the QI perspective combined with detailed evaluation of various sources of data relating the PBC concept of context to PU prevention, which will answer the research question of PU outcome in various acute care circumstances. Ultimately, the mechanisms of prevention guidelines will be examined and explored through the lens of QI, myself, various sources of data, and PBC analysis based on the context of acute care settings and circumstances potentially affecting outcomes.

Nature of Study

This qualitative research will use a case study methodology. The purpose of this study is to examine the effectiveness of acute care guidelines for the prevention of PUs in quadriplegic individuals (QI) by drawing insight from the participants and various

sources of data. A case study provides views of social reality constructed by individuals with different perspectives like interactions between patients and providers in acute care settings (Creswell, 2013). Evaluation of related situations can help develop a unique perspective in a case study (Creswell, 2013; Creswell, 2009); therefore, consideration of various sources of relevant data in this research seems appropriate for the examination of acute care prevention guidelines. The primary source of data was semistructed interviews conducted with study QI, healthcare clinicians, care providers, and family member participants, which were recorded and documented in transcript form (see Creswell, 2009). Field notes were taken, outlining observations made during evaluation of documents and interview sessions (see Creswell, 2009). Various sources of data included archival records or secondary data gathered related to hospital PU history, quality of care, staff training, and facility ratings to verify information collected during the study (see Creswell, 2009). Additional secondary sources of data collected were medical records and photographs, which can be used to document description of participant information (see Creswell, 2009).

A case study helps the researcher explore experiences focusing on individuals, organizations, events, programs, and processes bounded by time to expand on epistemology which exemplifies this qualitative research (Baxter & Jack, 2008; Rudestam & Newton, 2015). Subsequently, my observations derived meaning from the thematic development of the various data collected by using a qualitative approach (see Creswell, 2013; Miles, Huberman, & Saldana, 2014). Social constructivism was accented in the present case study, which led to an understanding of societal implications or

challenges, concepts or ideas related to human beings, and participant perspectives (see Creswell, 2013). This case study, concerning the evaluation of existing acute care guidelines, supported the idea that behavior of participants cannot be manipulated and will support the concept that the boundaries are not clear between the phenomenon of PU development and the context of hospitalization (see Baxter & Jack, 2008). The present study was a summative evaluation implicating judgment and decision-making (see Patton, 2002), but it evolved into a formative evaluation using participant perspectives to improve existing processes and protocol (see Patton, 2002). I used participant perspectives in the present research to establish "how" and "why" events occurred during the execution of PU prevention guidelines in acute care settings (see Baxter & Jack, 2008). Furthermore, the present case study design enabled me to discover behavior and actions of events involving participants and staff in acute care settings (see Creswell, 2013; Patton, 2002). The case study approach also helped evaluate viewpoints of the participants in the form of significant statement analysis and essence description about the topic of PUs (see Creswell, 2009). The present qualitative case study methodology uniquely fostered my goal to explore QI, clinician, care provider, and family member perspectives of PU prevention guidelines by attaching events and behaviors to the social structure of acute care settings in order to learn what participants experienced, how they perceived it, and why actions and decisions were made by providers concerning protocol (see Creswell, 2013).

In summary, the methodology of this case study examined PU prevention related to guidelines executed in acute care settings. The perspective of QI participants in this

case study was evaluated to determine if new or important knowledge can be ascertained from thematic development of the data. The semistructured open-ended interview questions were transcribed and used to show how the primary source of data was collected. The participant pool was reviewed, and the sampling technique was described. The role of the researcher was shown; ethical problems were considered; and bias was safeguarded by using a standardized research design along with strict documentation and a detailed journal. As the study progressed, all secondary sources of data were evaluated along with primary information using triangulation to develop themes depicting views and behaviors from the perspective of the QI population, data on hospital-acquired PU, and acute care prevention guidelines.

Definitions

Spinal cord injury: Spinal cord injury is damage to any part of the spinal column caused by trauma, inflammation, tumors, or nontraumatic causes such as infection, resulting in changes of strength, sensations, or body functions. Spinal cord injury is characterized by dysfunction of motion (paralysis), feeling, sphincters, and autonomic nerves below the plane of injury, culminating with impairment of quality of life (Dietz & Fouad, 2013; Mayo Clinic [MC], 2016; Yang et al., 2014).

Complete spinal cord injury: Complete spinal cord injury is trauma leading to no motor or sensory function in the sacral segments of S4-S5 vertebrae exhibiting loss of control of lower limbs, trunk and upper limbs as well as autonomic (involuntary) regulation of the body affecting breathing, heart rate, blood pressure, temperature, the bowel, the bladder, and sexual function and is referred to as quadriplegia or tetraplegia

(Dietz & Fouad, 2013; Mayo Clinic [MC], 2016; Middendorp, Goss, Urquhart, Atresh, Williams, & Schuetz, 2011; World Health Organization [WHO], 2013; Yang et al., 2014).

Repositioning: Repositioning is specific regular movement from one position to another every two hours for disabled, elderly, or immobile individuals to prevent pressure ulcers (AHRQ, 2016; CDC; 2015; NPUAP; 2009; Peterson, Gravenstein, Schwab, Oostrom, & Caruso, 2013; Schofield et al., 2012; Talsma, Tschsannen, Guo, & Kazemi, 2011).

Tunneling: Tunneling is tissue destruction below the surface that has an opening at skin level. This channel may be referred to as a sinus tract which may involve a portion of a wound larger than the visible ulcer. This may be a characteristic of Stage III or Stage IV PU classification as well as unstageable wound varieties. However, the treatment will follow the directions attributed to Stage III and Stage IV wounds (Johns Hopkins Medicine [JHM], 2016a; NPUAP, 2014b; Wake, 2010).

Undermining: Undermining is tissue destruction or ulceration below the skin surface extending under the wound beyond the edges causing the ulcer to be larger than it appears. This classification is differentiated from tunneling by the larger extent of the wound edge but without a channel or sinus tract. The length, width, depth, and location are important for clinicians related to diagnosis, prognosis, and healing. This type of ulcer can be treated with invasive incisions, debridement, and negative pressure therapy (JHM, 2016a; NPUAP, 2014b; Wake, 2010; Miura, Ito, Matsuda, Abe, & Kitaba, 2013).

Nonblanchable erythema: Nonblanchable erythema is persistent redness of intact skin when light pressure is applied. Skin assessment for PUs should take into consideration any kind of non-specific redness. Persistent redness with or without temperature changes is a strong indicator of a Stage I PU, and regular repositioning should occur immediately (Ayello, 2014; Black et al., 2007; Cooper, 2006; Sharp & McLaws, 2005; Kohta et al., 2015; NPUAP, 2014b).

Autonomic dysreflexia: Autonomic dysreflexia is a dangerous complication of high-level spinal cord injury (above the T6 vertebrae) in which sympathetic discharge (spinal autonomic reflexes) cause pulmonary issues characterized by increased blood pressure and bradycardia (abnormally slow heart action). The event is triggered by noxious (potential tissue damaging) visceral or somatic stimulation (which may include PUs) below the level of spinal injury. This is a life-threatening event. (Bauman, Milligan, Lee, & Riva, 2012; Fausel & Paski, 2014; Pannek, Gocking, & Bersch, 2010; Sezer, Akkus, & Uğurlu, 2015; Yang et al., 2014; Zhang, et al., 2013).

Assumptions

I conducted this qualitative case study conducted under the assumption that prevention of many PUs is attainable. It is assumed that standard use of repositioning and skin assessment using acute care guidelines can efficiently prevent PUs. It is assumed that the interviewees will give honest and forthcoming answers, which is important because the perspectives of participants must be considered valid due to the impact on the credibility of a case study. Also, an assumption existed that participants were willing and able to express behaviors, history, and events surrounding their knowledge of PUs in

acute care settings. I assumed that the data collected from interviews accurately reflected the PU prevention phenomenon. Also, I assumed that data from various sources, such as government agencies and hospitals, accurately and clearly depicted the impact of PUs on acute care settings, as well as, provide visualization of pathways that may lead to improved outcomes. Lastly, there is an assumption that SCI, QI, and others bring important knowledge to acute care settings on the issue of PU prevention.

Scope and Delimitations

The scope of this research was to address prevention of PUs in acute care settings and the improvement of AE related to secondarily-acquired pressure wounds (AHRQ, 2016; Kim et al., 2014); because, 3 million people in the United States are affected by PU caused by immobility (Ackroyd-Stolarz et al., 2014; Johansen et al., 2015; Smith et al., 2013). Additionally, according to Marin et al. (2013), SCI and QI have not been adequately represented during the development of PU prevention strategies; therefore, the study was restricted to QI and did not include other severely disabled and vulnerable populations who also have mobility issues. QI, who have experience with PU prevention guidelines in acute care settings, were chosen for this study due to their high risk for complications of wounds caused by immobility and the vigilance of the population related to preventive routines (Ghaisas et al., 2015; Jensen et al., 2013; Rathore & Mansoor, 2012). The study did not take into consideration the (a) age of the participants, (b) gender of interviewees, (c) ethnicity of those involved in the research, (d) geographical location, (e) level of injury (other than condition of quadriplegia), or (f) time since spinal cord trauma. The study is delimited by access to public information

from institutions and government agencies about PU occurrence in acute care settings. Additionally, the study did not describe evidence-based theories of protocol evaluation such as the (a) transitions theory of acute care management in which changing events in provision of care affect roles, vulnerability, nursing interventions, and social systems (Meleis, 2010), (b) interpersonal theory in which personal relationships occur between patients and nurses (Courey, Martsolf, Draucker, & Strickland, 2011; Peplau, 1997), or (c) the system model in which client wellness is reflected by environmental stressors (Knight, 1990). However, PBC was chosen to underpin this study because it directly addresses program and guideline protocol that affects development of PUs. Specifically, PBC protocol evaluation states the mechanism such as PU prevention guidelines executed by providers is affected by the context or situation that potentially exists (see Pawson & Tilley, 2004; Rycroft-Malone et al., 2010), and these circumstances in acute care settings have an effect on the provision of care which may or may not lead to a PU outcome (see Pawson & Tilley, 2004; Rycroft-Malone et al., 2010). Finally, the study focused on QI, but it may achieve transferability to (a) some severely disabled individuals, (b) bedridden elderly patients, and (c) those who experience immobility in intensive care or undergo sedation; because, PUs occur primarily due to inability to move without assistance (see AHRQ, 2016; NPUAP, 2014a).

Limitations

Limitations exist in this case study related to potential bias stemming from my professional and personal experience evaluating and treating PUs. The study may be limited by participant bias during expression of experiences in acute care settings

surrounding PU prevention guidelines. The study is also limited by the inability to independently verify the self-reported responses of the participants. To address this uncertainty, the study design allowed the participants to answer the open-ended interview questions without interruption in order to arrive at perspectives. Clarification of meanings were provided whenever necessary. I also explained confidentiality and anonymity to each participant. Additionally, I utilized in-depth personal reflection about credibility because I am the sole researcher responsible for analysis and interpretation of data. Furthermore, credibility and dependability were supported by member checking, bracketing, semistructured interview questions, and review of codes and themes by a qualified independent researcher (see Creswell, 2013; Miles et al., 2014; Patton, 2002; Rudestam & Newton, 2015). Researcher bias is always a concern with qualitative research; however, subjectivity was avoided in this case study by standardizing the interview process and creating a study design utilizing triangulation of data and themes (see Creswell, 2013; Miles et al., 2014; Patton, 2002; Rudestam & Newton, 2015). Furthermore, researcher bias was addressed by use of a detailed audit of the research process and the use of a researcher journal to maintain a reflective view of the data collection and thematic development (see Creswell, 2013; Miles et al., 2014). Ultimately, the study was limited demographically to ethnicity and culture of a localized population, rehabilitation hospitals, and online communities. Although limitations exist due to generalization (Patton, 2002), this multiple case study exhibits transferability as a firm foundation for further studies on the subject of hospital-acquired PUs and the struggle of

SCI and QI concerning prevention and treatment of deep tissue injury related to immobility.

Significance of the Study

This study was designed to uniquely address the need to examine the effectiveness of PU prevention guidelines in acute care settings (Marin et al., 2013) by taking into consideration the perspectives of QI and other relevant sources of data. This study expects to highlight strengths and weaknesses associated with current acute care PU prevention protocols and may serve as a catalyst for a critical reexamination of these guidelines by instigating changes to improve client health outcomes. In addition, this study may spur a cultural shift within the healthcare community that takes a more proactive approach to soliciting and incorporating client input into the development of treatment protocols designed to address the health needs and concerns of unique patient populations. This study may promote a positive social change by highlighting the specific health needs of QI patients and the unintended consequences associated with poorly developed and executed PU prevention guidelines within hospital-based acute care settings. More specifically, I anticipate that this study will offer new insights into the effectiveness of PU prevention guidelines by incorporating a holistic assessment approach which may ultimately result in a reduction of hospital-acquired PUs; thereby improving the quality of life for high-risk SCI patients and contribute to avoidance of unnecessary AE. I hope that this study will serve as a catalyst for future scholarly inquiry into the SCI health-related outcomes in the U.S. and abroad.

Summary

Prevention of pressure ulcers in acute care settings is part of an effort to avoid AE in healthcare (AHRQ, 2016). In the United States, approximately 3 million SCI, elderly, and individuals sedated after surgery are affected by PUs (Ackroyd-Stolarz et al., 2014; Johansen et al., 2015; Smith et al., 2013); however, statistical data indicates that not much progress has been made toward prevention of PUs for high-risk patients (Black et al., 2014). AE include all hospital-acquired pressure wounds, but NE, which include Stage III and Stage IV PU, have been categorized as preventable (AHRQ, 2016). Individuals experiencing immobility are at highest-risk for PUs (Ackroyd-Stolarz et al., 2014); therefore, secondarily-acquired wounds, which includes PUs, are the most prevalent complication for SCI and QI (Clark et al., 2014). Latimer et al., (2014) cite that SCI have PU prevention knowledge, which can be utilized as prevention strategies involving teamwork and participation in hospitals. Furthermore, Marin et al. (2013) believe SCI, which includes QI, were not adequately represented during the creation of strategies for pressure ulcer prevention guidelines, creating a gap in the literature calling for further research. This qualitative case study aims to establish "how" and "why" events like secondarily-acquired PUs occur from the QI perspective of behaviors and actions observed in acute care settings (see Baxter & Jack, 2008; Creswell, 2013; Patton, 2002). Chapter 2 will describe the SCI and QI population from viewpoint of their unique battle with PUs and struggles with immobility related to lifestyle ramifications. Ultimately, in Chapter 2, I will explore the causes, assessment, prevention, and treatment of PUs in

acute care settings by describing the etiology, physiology, and anatomy of pressure wounds based on an extensive literature review.

Chapter 2: Literature Review

Introduction

Pressure ulcers are a complex health issue that affects individuals who have become immobile because of serious injury, incapacitation due to surgery, obesity, or inability to move because of age (AHRQ, 2016). One of the most serious conditions causing immobility is a spinal cord injury which can leave an individual paralyzed below the point of the injury (Munce et al., 2014; Jensen et al., 2013). Severity of the paralysis will increase the higher on the spinal column the injury occurs based on Frankel's five-point scale from 1969 which was replaced by the American Spinal Injury Association (ASIA) scale in 1994 (Middendorp et al., 2011). The ASIA scale rates paralysis accordingly: A (complete), B (sensory only), C (motor useless), D (motor useful), and E (complete recovery). The levels of severity depend on whether the injury is located in the cervical, thoracic, lumbar, or sacral regions of the spine (Ibarra, Rios-Hoyo, Suarez-Meade, Malagón, & Colin-Rodríguez, 2014). The condition referred to as quadriplegia or tetraplegia, in which a person may lose function in all four limbs, might occur when high level spinal injury affects the cervical area of the spine (FRI, 2013; Grossman et al., 2012; Ibarra, Rios-Hoyo, Suarez-Meade, Malagón, & Colin-Rodríguez, 2014; Middendorp et al., 2011). A person may become bedridden or wheelchair bound when faced with these conditions (FRI, 2013). Consequently, immobility will make the person unable to move and the pressure of lying or sitting on boney areas of the body can cause a wound called a PU, decubitus ulcer, pressure wound, pressure sore or pressure injury (AHRQ, 2015; CDC, 2013; Coleman, 2013; Cooper, 2013; Edsberg, et al., 2016; Zeller,

Lynn, & Glass, 2006). Therefore, PUs are a problem of continuous vigilance for SCI or QI during a daily routine, as well as for clinicians in hospitals or nursing homes (AHRQ, 2015; CDC, 2015).

A PU can be as simple as an irritation or redness of the skin to a deep wound that reaches to the bone (Cox, 2011; Kinsley, 2014; Warner-Maron, 2015). PUs are classified according to the seriousness or depth of the wound (Braden & Bergstrom, 1994; Kinsley, 2014). PUs can cause complications including infection which may lead to death of the patient (Eslami et al., 2012). There are multiple causes of a PU and guidelines have been described for clinicians, patients, family members, and care providers to help prevent the occurrence of PUs and facilitate healing (AHRQ, 2016; CDC, 2015). Repositioning of the patient and the use of specialized equipment are prime factors involved in PU prevention or healing (Ackroyd-Stolarz et al., 2014). It is recommended that the pressure is relieved on the susceptible boney areas of the body, by providing mobility or raising the affected areas off surfaces, thereby protecting soft tissue (Schofield, Porter-Armstrong, & Stinson, 2012). Much research has been done on PUs and related issues, but to date there are minimal studies involving feedback from patients such as SCI or QI (Marin et. al., 2013); these patients are the most susceptible to these issues and are continually working to prevent pressure wounds in daily activities or during hospitalization (Ghavam et al., 2014). Hospital-acquired PUs are an enormously serious problem for SCI, QI, and other susceptible groups (AHRQ, 2016; CDC, 2015). It is the feedback of the most susceptible group, QI, and examination of various sources of data

gathered in this study, which will examine the effectiveness of acute care guidelines for the prevention of PUs vulnerable populations.

This chapter details my use of a structured literature review strategy to locate scholarly articles relevant to the problem and purpose for this study as well as proposed theory that underpins the research. Strategies, search terms, and databases utilized are presented to support reproducibility. Previous conceptual applications are discussed related to origins of the proposed theory, constructs corresponding to the framework outlined in this research plan, discussion of similar studies, and as a guide for the execution of these ideas concerning the development of this proposed study. Literature was reviewed to describe the depth, breadth and application of the current research. Major themes are evaluated along with a presentation of gaps recognized in existing literature related to the issues expressed within this examination. Quality of life and daily routine of SCI or QI are described based on current research to relay their struggles with PUs. Furthermore, the literature review is a scholarly analysis of all aspects of the PU issue, including to surmise hospital acquired PUs, and outline the existing acute care guidelines. The review presents an understanding of current knowledge on pressure ulcers including assessment, prevention, and treatment that exposes gaps in the literature laying the foundation for improvement of the existing acute care guidelines.

Literature Search Strategy

Peer-reviewed articles were the focus of the literature research. Secondary sources were used from original publishing authors. Preference was given to articles published within 5 years. Additionally, data from the Centers for Medicare and Medicaid Services

(CMS), AHRQ, CDC, Institute of Medicine (IOM), and various spinal injury associations was used to establish parameters for the literature research. The information was gathered from agency contact or Internet sites.

Relevant literature was collected from the following databases: EBSCO, Academic Search Complete, MEDLINE with Full Text, ProQuest Health and Medical Complete, Ovid Nursing Journals Full Text, ProQuest Central, ProQuest Nursing & Allied Health Source, PubMed, CINAHL Plus with Full Text, PsycINFO, and Research Gate. Keywords used in the literature search were as follows: *pressure ulcers, pressure sores, pressure wounds, decubitus ulcers, quadriplegia, spinal cord injury, SCI, pressure ulcer prevention, qualitative, adverse event, serious adverse event, protocol based theory, protocol mechanism, protocol context,* and *protocol outcome*. I reviewed five books, 10 dissertations, and over 3,000 pertinent articles which I narrowed down to approximately 200 sources of information about keywords, acute care guidelines, and clinical protocols. I have reviewed article abstracts first and later analyzed the full text according to the importance of the information by starting with a topical outline and later pulling references from cited published sources. Inclusion in this review was determined by whether inserting the key terms in the above search engines described (a) PU assessment, (b) prevention or treatment of PUs, (c) the various complications of the condition of quadriplegia, (d) acute care guidelines, or (e) protocol related to these issues. Finally, the most current articles were given priority.

Application of Theory

Background

Protocol-based care theory (PBC) is a theory of program evaluation developed by the National Health Service in the United Kingdom to provide statements and standards for care pathways, patient group directives, algorithms, clinical guidelines and procedures (Rycroft-Malone et. al, 2007). One goal of PBC is to strengthen the coordination of services across professional and clinical boundaries (Rycroft-Malone et al., 2010). Rycroft-Malone et al. (2010) state the development of programs, practices, or guidelines is based on the constructs of mechanism, context, and outcome (Rycroft-Malone et al, 2010; Rycroft-Malone, 2007; Pawson & Tilley, 2004), and according to Rycroft-Malone et al. (2007), PBC has a positive impact on the issues of surgery, stroke, and PUs. Also, Rycroft-Malone et al. (2010) add that the realist evaluation work of Ray Pawson and Nick Tilley creates the basis for the conceptual framework and concept of mechanism, context, and outcome (Pawson & Tilley, 2004) used in PBC. The core of PBC states that mechanisms bring about effects when put into action within various circumstances or contexts leading to outcomes (Pawson & Tilley, 2004; Rycroft-Malone et al, 2010), and it is from this perspective that PBC supports the research on PU acute care guidelines, continuity, and standardization required to provide quality care for SCI or QI. The guidelines for PU prevention in acute care settings or the community were established to provide an outcome that diminishes AE through continuity of actions (AHRQ, 2016; Chandler et al, 2013). Guidelines in healthcare are a mechanism for assessment and prevention (AHRQ, 2016; Pawson & Tilley, 2004) which are meant to be used in

different contexts, such as institutions and the norms, values or interrelationships within them (Lacouture, Breton, Guichard, & Ridde, 2015). The goal is to deliver a positive outcome that deters AE like PUs, medication errors, nosocomial infections, and patient falling injury (Lucero, Lake, & Aiken, 2010; Pawson & Tilley, 2004). Therefore, PBC aligns with effectiveness and improvement of PU prevention guidelines in acute care settings; because evaluation of the configurations of mechanism and context will help to explore evidence for what works, for whom, how, and in what circumstances from a viewpoint of causality (Rycroft-Malone et al, 2010; Pawson & Tilley, 2004). From this evidence-based interpretation, guidelines such as PU prevention can be facilitated by the decision-making processes to improve awareness in different circumstances (Rycroft-Malone et al., 2009) through a realist approach, utilizing a philosophical strategy of realism and flexibility, so interventions can focus on outcomes through the lens of contexts and causal mechanisms to enable actualized effective healthcare (Rycroft-Malone et al., 2012).

PBC and Intervention

Theory-driven evaluation associated with PBC impacts behavioral deficiencies and inequalities by supporting social improvement and human imagination (Pawson & Tilley, 2004). Researchers have evaluated PBC from the perspective of realist synthesis or realistic evaluation which follows a broad process related to causality acknowledged by complex interventions and the exploration of evidence on whether a program works and how it works (Rycroft-Malone et al, 2010). Health interventions aim for a causality related framework that improves overall well-being of the population while diminishing

inequalities (Goldberg, 2014; Pawson & Tilley, 2004). The evidence-based practice of PBC is an avenue for implementation of programs and guidelines; therefore, success may be dependent on leadership, culture, and environmental pressure (Stetler, Ritchie, Rycroft-Malone, Schultz, & Charns, 2009). In this environment of factors related to mechanism, the chain of events that determine a diversion from protocol or a change are evaluated concerning the cause, the desired effect, and whether outside factors are involved such as minimal contribution, direct influence, or indirect impact (Mayne, 2008). Within this model, realistic evaluation and PBC achieve insight into effectiveness of programs and guidelines (Pawson & Tilley, 2004). In addition, researchers state that the chain of causality affecting preventable hospitalization or emergency room treatment is improved by evidence-based decision-making, continuity of care, and standardization offered by PBC (Bentler et al., 2014; Chandler et al, 2013; Rycroft-Malone et al, 2010).

Operationalization Using PBC

Change is an intervention that can improve utilization or operationalization through the effectiveness of evidence, and it is through decision-making that the process of cognitive, social, and creative ideas are organized into contextual and behavioral factors providing an effective healthcare format in which stakeholders can implement high quality care and patient outcomes (McCormack et al., 2013). A key component of evidence-based care is receptivity by stakeholders of the contextual elements in which culture and leadership foster strategic operational change (Stetler et al., 2009). Rycroft-Malone et al. (2014) state evidence shows workforce training can synthesize interventions or “what happens” (mechanism) in different conditions (context) to affect

outcome of staff development; furthermore, if prompts resonate with listeners and design of intervention is aimed at those who need information, positive changes occur for those being trained. The PBC realist approach can then be accomplished. Also, it is important for workers to feel recognized (mechanism) with opportunities reflecting incentivisation (context) that leads to emotional participation (outcome) **(**Rycroft-Malone, Burton, Williams, & Williams, 2015**).** According to Balzer and Kottner (2015) implementation of evidence-based guidelines related to PUs can be achieved using the mechanisms of mobility, skin care, and nutrition in conjunction with the context of patient collaboration, multidisciplinary action, documentation, and teamwork to increase effectiveness and execution of operational interventions **(**Qaseem et al., 2015). Nursing units backed by education, quality assessment, good documentation, patient knowledge, and awareness create an atmosphere of participation and evidence-based care that provides positive outcomes in PU prevention (Cooper, 2013). Pinkney (2014) states poor organizational context can deliver system failures such as miscommunication and overall governance of services, citing *To Err is Human* that said a safety failure is system failure. According to Brindle, Creehan, Black, and Zimmerman (2015), institutions performing well for PU prevention have an integrated system of leadership, evidence-based culture, staff development, accountability, and technology. Furthermore, successful prevention of PUs has been accomplished with implementation of protocol utilizing the Braden Scale, empowerment of the nursing staff to treat high-risk patients early in the admission structure, a quarterly surveillance of processes, and reinforcement of repositioning practices (Cano et al., 2015). Realistic evaluation in this manner supports continuity of

care and causality within programs (Bentler et al., 2014) and aligns with PU prevention and treatment using evidence-based PBC (Rycroft-Malone et al, 2010) based on the acute care guidelines (AHRQ, 2016; CDC, 2015).

Patients who are challenged with immobility and critical illness have a high risk for PU development and share similar acute care guidelines (Ackroyd-Stolarz et al., 2014; Johansen et al., 2015; Mansfield, Meyer, Ugiliweneza, Kong, & Nosova, 2014). In an Agency for Healthcare Research and Quality report, Sullivan (2013) states evidence-based reeducation and utilization of acute care guidelines significantly reduced the occurrence of PUs with reduction of wounds from 50% to 90% in multiple studies, and one Florida hospital showed a $3,000 per case savings related to pressure wounds calculated as a yearly savings of $11.5 million during the study. Brown and Kitterman (2013) stated in a 350 bed Indiana teaching hospital PU cases had risen; so the hospital followed guidance from the National Pressure Ulcer Panel and began education of clinicians, obtained necessary supplies, and integrated evidence-based practices which accounted for an extreme reduction of wounds and a savings of $2.7 million within two years. The University of Miami Hospital implemented a program in 2009 to identify hospital-acquired PUs which included committee-driven care, evidence-based strategy (including inpatient bed replacement, updated delivery protocol, monitored turning schedules, and newly hired wound care staff), and the facility realized a decrease in prevalence of stage II to stage IV wounds from 11.7% to 2.1% in only one quarter (Cano, et al., 2015). A large hospital cardiac unit showed a reduction in surgical department PU development through awareness, documentation, and adherence to skin check protocol;

while, leadership, responsibility, training and simplicity provided efficiency and consistency through evidence-based practice (Paul, McCutcheon, Tregarthen, Denend, & Zenios, 2014). In addition, it was noted that a change in protocol allowing repositioning of patients on cardiac assistive devices is a key PU preventative (Paul et al., 2014). Fakhry, Trask, Waller, and Watts (2003) used evidence-based protocol and PBC to treat traumatic brain injury patients and found the operationalization of guideline standardization improved the outcomes of patients and decreased hospital charges. Additionally, Brazinova, Maidan, Leitgeb, Trimmel, and Mauritz, (2015) demonstrated that evidence-based continuity of care definitely improved traumatic brain injury patient outcomes and reduced hospital mortality rates from 31% to 23% for this demographic. In the study of Fakhry et al. (2003), intensive care stay was reduced by 5.4 days and hospital charges decreased by $6,500 to $8,500 with protocol-based care, indicating a reduction in charges by $4.7 million over a 6 year period.

Summary

Many factors influence development of evidence-based healthcare, but according to Lacouture et al. (2015), Pawson and Tilley envisioned a complex mechanism embedded in social reality supporting program outputs that flow from stakeholder decisions. Furthermore, Ellen et al. (2013) postulated that a receptive climate, education, and strong leadership influenced complex initiatives and decision-making. Also, successful expression of Pawson and Tilley's realistic evaluation must be intertwined with collaboration, participation, partnership, and management processes of stakeholders,

policies, healthcare workers, and patients in order to improve behaviors, practices, programs and performances (Lacouture et al., 2015).

Standardization of care incorporates mechanism and context which are crucial elements of PBC that aims to provide continuity in outcomes by awareness and change created through positive performance (Chandler et al, 2013; Mayne, 2008). Furthermore, it is the aim of PBC to achieve standardization, continuity, and a positive outcome within all contexts or circumstances (Rycroft-Malone et al, 2010). One additional aspect of PBC is that its realistic evaluation also includes the stakeholders in the mechanism, context, and outcomes (Rycroft-Malone et al., 2007). In the case of QI and PU prevention in acute care settings, stakeholders include the spinal cord injury patient, the patient's family, the clinicians, and the facility. Bentler et al. (2014) state, that to impact reform offered by continuity, the perspective of patients and providers along with their experience is necessary to lower the risk of rehospitalization and mortality. Subsequently, the research questions in this study are formulated using concepts from Protocol-Based Care Theory in an effort to gain information about prevention guidelines that concern the stakeholders. RQ1 one asks to what extent does the mechanism of PU prevention guidelines in acute care settings prevent the outcome of wound development? RQ2 asks how does the context of care in an acute care setting affect the mechanism of PU prevention? I propose that a theory-driven evaluation like PBC (Chandler et al, 2013) examines standardization and continuity, including the decision-making process of clinicians and administrators on mechanisms and contexts (see Rycroft-Malone et al., 2009), but the impact on PU

prevention from the viewpoint of all stakeholders, including the QI perspective, should create beneficial outcomes and improvements in protocol.

Conclusion

Programs are theories (Pawson & Tilley, 2004) and PU involves a strategy of prevention (AHRQ, 2016; Rycroft-Malone et al, 2010) which is part of daily assessment and routine for QI (see Marin et al., 2013). According to Marin et al. (2013), the perspective of QI, who are one of the main stakeholders involved in PU assessment and prevention, was not adequately incorporated into the development of acute care prevention guidelines. Therefore, PBC, using realistic evaluation, and evidence-based care can act to improve acute care guidelines by cooperation of the various participants, notation of every influence, and attentiveness to all perspectives to improve the standardization of programs by analyzing each element of mechanism, context, and outcome (see Bentler et al., 2014; Chandler et al, 2013; Pawson & Tilley, 2004; Rycroft-Malone et al, 2010).

The Pressure Ulcer Problem

PUs are a healthcare problem and complication affecting approximately 3 million adults in the United States (Smith et al., 2013). PUs are a concern not only in the United States but throughout the world where up to 100% of all SCI patients in developing countries may be affected (Zabrasek et al., 2015). Researchers show that the elderly, surgical patients, and SCI are affected the most (Johansen et al., 2015; Ackroyd-Stolarz et al., 2014). According to Ackroyd-Stolarz et al., (2014), up to 60% of new ulcers develop during hospitalization with PU incidence rates of 0.4% to 38% in acute care settings

depending on variability and standardization of data collection (Black et al., 2015). Rehospitalization and malpractice suits related to PUs cost the healthcare system $9.1 billion to $11 billion annually (Bruce et al., 2012); therefore, prevention of PUs is a prime concern, in which the goal is to avoid serious complications, including death (AHRQ, 2016). Delayed healing and long-term care for PUs can average a cost of $127K per ulcer (Brem et al., 2010) while community dwelling SCI with PUs can cost $4,745 monthly (Chan et al., 2013). According to Eslami et al. (2012), serious complications and AE related to PUs affect up to 85% of the high-risk SCI population. Tung, Stead, Mann, Pham, and Popovic, (2015) state $86 billion has been spent on PU treatment for SCI veterans in the United States. Even though recent innovation has created new procedures and protective surfaces, little progress has been made in the past 20 years toward sustainable prevention of PUs concerning high-risk patients (Black et al., 2015).

Adverse Events

PUs are rated as Stage I or no open wounds, Stage II or a painful open abrasion, Stage III or extending into tissue, and Stage IV or reaching deep into muscle and bone (AHRQ, 2016; Edsberg et al., 2016). The Centers for Medicare and Medicaid reported 257,412 cases of Stage 3 and Stage 4 hospital-acquired PUs in 2007, but the number may be underestimated due to faulty discharge data (Zaratkiewicz et al., 2011). Complications such as hospital-acquired PUs are considered AE which are defined as unintended harm, but serious AE (SAE) involve prolonged inpatient hospitalization, significant incapacity, or death (FDA, 2014; Thomas & Compton, 2014). AE include all PUs acquired in a hospital, but Stage III and Stage IV pressure wounds are defined as “never events”(NE)

and are classified as preventable by the Centers for Medicare and Medicaid Services on a list of cases which will not receive payment as of 2007 (AHRQ, 2016; CDC, 2015). Improved data on AE and NE from 1993 to 2006 estimates that hospitalization was up 86.4% related to secondary diagnoses such as PUs (Zaratkiewicz et al., 2011). A national review shows at least 10% of hospital admissions appear to be associated with AE and may cause permanent disability or even death, but 43% of these events are deemed preventable (Rafter et al., 2014).

QI Susceptibility

QI are susceptible to PUs due to multiple factors such as age, degenerating body systems, length of time of injury (Jensen et al., 2013), and especially immobility (Ackroyd-Stolarz et al., 2014). Furthermore, these patient susceptibilities may cause AE like secondarily-acquired wounds, infections, and complications (Clark et al., 2014). For this reason, SCI, including QI, are high-risk patients during hospitalization and are vulnerable to lack of movement, skin care, and diet (Gillespie et al., 2014). Not all risk factors for the prevention of PUs have been identified (Marin et al., 2014), but reliable assessment of risk factors based on patient views of preventive measures in hospitals could be beneficial (Coleman et al, 2013). SCI patients possess unique knowledge about PU prevention, which can be used in hospitals to create teamwork strategies between nurses, patients, and organizations (Latimer et al., 2014). For this reason, McInnes et. al. (2014) postulated how patient participation could create a new understanding of existing PU prevention guidelines in acute care settings. Marin et al. (2013) recognized a failure to adequately represent SCI patients in the formulation of strategies to prevent PUs, so

they have suggested that further research on patient perspective may fill a gap in existing literature.

Pressure Ulcer Causes

The main high-risk groups for PUs are SCI, the elderly, and surgical patients (Johansen, Bakken, & Moore, 2015). QI are a subgroup of the vulnerable population of SCI who are constantly vigilant about the development of PUs. SCI and QI are a high-risk group (Jensen et al., 2013), and severity of an illness, male gender, and length of stay in an intensive care unit (ICU) may increase the potential for development of PUs (Krupp & Monfre, 2015). Poor hygiene, stress, and substance abuse can also increase the risk of PU (Ghaisas et al., 2015), but one of the main risk factors SCI, QI, and bedridden or sedentary individuals naturally face is the condition of immobility (Ackroyd-Stolarz et al., 2014). According to Clark et al. (2014) immobility for high-risk populations may cause events which lead to secondarily-acquired wounds such as PUs and infections. Long periods of immobility along with hypotension (low blood pressure) can develop into the ischemic type of PU characterized by inadequate blood flow to localized areas of tissue (Black, Brindle, & Honaker, 2015). Subsequently, a condition called ischemia reperfusion injury may be caused when restoration of normal arterial and vascular inflow occurs (Agrawal & Chauhan, 2012; Jiang, Qian, Wang, & Zhang, 2011; Kalogeris, Baines, Krenz, & Korthuis, 2012; Sharp & McLaws, 2005). Reperfusion is the act of normal function restoration characterized by increase in skin temperature, but if there is existing pressure damage, cell necrosis may be created for individuals who lack mobility (Agrawal & Chauhan, 2012; Jiang et al., 2011; Kalogeris et al., 2012; Sharp & McLaws,

2005). Reactive hyperemia is also characterized by restoration of blood flow to tissue or organs, but normal increase in temperature to the area may not occur in damaged tissue, leading to free radical formation and necrosis (Agrawal & Chauhan, 2012; Jiang et al., 2011; Kalogeris et al., 2012; Sharp & McLaws, 2005). Decreased blood supply, device pressure, skin fold moisture, and hindrances to the performance of bedding or clothing changes are challenges that clinicians also face preventing PUs for vulnerable patients like QI (Edsberg, et al. 2016; Cooper, 2013). Gillespie et al., (2014) state prolonged pressure on boney parts of the body causes oxygen deprivation to those areas, but physical repositioning reduces the duration and decreases tissue hypoxia (diminished oxygenation), as well as the theoretical risk of ulceration (JHM, 2016a; NPUAP, 2014b; Ferrell, Coyle, & Paice, 2015; Cox, & Roche, 2015; Cox, 2013; Sharp & McLaws, 2005). Damage to the epithelium, or outer layers of skin, requires caution; because the dermis, or underlying layers of tissue in QI are extremely delicate and easily compromised by pressure, friction, and shear (Wound Source[WS], 2014; Evans, Oreffo, Healy, Thurner, & Man, 2013; JHM, 2016b; Ciarlettaa, & Ben Amar, 2011; O'Rahilly, Muller, Carpenter, & Swenson, 2012; Medscape, 2015; Roy, 2012; Loyola University Chicago, 1996). Furthermore, friction and shear should be avoided especially over a PU; because, wound healing begins from the outer edges inward, and the pink moist granulation tissue leads to new blood cells, collagen, and fibroblasts which may indicate a surrogate marker depicting outcome for PUs (NPUAP, 2014b; University of Washington [UW], 2016; United Spinal Association [USA], 2016; Valenzuela-Silva et al., 2013; WS, 2014). Coleman et al. (2014) propose that direct causal factors like immobility and indirect

implications such as personal skin status characterized by epidemiological, physiological, and biomechanical elements create individual tolerance or susceptibility coupled with mechanical boundary conditions or pressure load to produce PUs.

Risk Factors

There are many risk factors that may lead to a PU, including mobility, existing PUs, perfusion such as diabetes, vascular disease, circulation, blood pressure, smoking, moisture such as urinary incontinence or fecal incontinence, body temperature, nutrition, and age (Coleman et al., 2013). Friction and shear may remove outer epidermal surfaces, reducing protection, and low blood pressure conditions for SCI increases local tissue response (Cooper, 2013). These risk factors must be stringently monitored as a path for prevention to avoid pain and suffering (Talsma et al., 2011). The complexity of PUs creates mystery about prevention. However, the many identified risk factors and characteristics of PUs which include mobility/activity, perfusion, skin status such as redness, blanching erythema or lesions that lose redness when pressed, discoloration, localized heat, and dryness or moisture control of surrounding areas can prove to be most beneficial when developing strategies (Coleman et al., 2013).

Prevalence

PUs have received a great deal of attention and research, but occurrence of this patient condition is still high (Bandeira et al., 2014). Daily routine and patient specific risk profiles are suggested by AHRQ (2016) to help individuals prevent PUs, and Olsho et al. (2014) concluded after evaluation of the AHRQ On-Time Pressure Ulcer Prevention Program for nursing homes that timely updates of patient risk information and regular

monitoring of data can create improved communication for multidisciplinary teams and provide a significant reduction of deep tissue wounds. Hospital-acquired PUs are still a concern, and modern technology has not proven to be the most effective means of prevention; however, conventional nursing techniques such as regular turning, care for bedding, and nutrition stand out as protocols for efficiency (Talsma et al., 2011). Cano et al. (2015) state positive outcomes for PU prevalence were realized by mandating a wound, ostomy, and continence nurse to departments with high-risk patients, re-educating all staff, and trialing new products for prevention.

An 86% increase of PUs between 1996 and 2006 was verified related to hospital or facility admissions (Zaratkiewicz et al., 2011). Two of the most significant elements for PU risk in hospitals are mechanical ventilation and sedation; because, ventilator support does not provide enough tissue oxygenation, and sedated patients have been shown to be associated with a five-fold occurrence of deep ulcers, and one university facility documented 62.5% of the individuals in the ICU had pressure wounds (Bandeira et al., 2014). These risk factors are a prime concern for clinicians; since, over 90% of hospital-acquired PU cases were related to treating other morbidities such as pneumonia and septicemia (Talsma et al., 2011), but it is difficult to reposition a patient on a ventilator, causing prevention challenges (Bandeira et al., 2014).

Other Causes

There are other causes of PUs such as muscle spasms or spasticity in SCI and QI (Naicker, Roohi, & Chan, 2009). Researchers have chronicled health priorities of individuals with SCI, and they have found only a few studies about muscle spasm related

PUs (Simpson, Eng, Hsieh, & Wolfe, 2012). Evidence shows orthotic devices may cause skin infections, dermatitis, and PUs, adding further proof to the vulnerability of SCI, QI, and disabled individuals (Pittaccio, Garavaglia, Viscuso, Beretta, & Strazzer, 2013). Schofield, Porter-Armstrong, and Stinson (2012) state prolonged sitting can create a risk for PU development; so, pressure relieving movements such as pushups and forward lean in a wheelchair are recommended activities. Also, Akca, Aydin, and Gumus (2015) speculate spending time in rehabilitation centers or nursing homes drastically increases the risk factor for development of PUs; while, Ip and Dicianno (2015) postulate that depression and psychosocial factors can lead to new wounds due to prolonged time in bed or self-neglect.

Hospital-Acquired Pressure Ulcers

Hospital-acquired PUs have become a metric for quality of care and reimbursement by CMS with the ICU being a prime concern for wound development (Krupp & Monfre, 2015). Researchers speculate that nurses are able to identify PUs in the early stages (Bandeira et al., 2014), but by regulating Stage III and IV wounds that are not documented upon admission, CMS and AHRQ have provided incentive for institutions to evaluate their prevention and treatment programs (Krupp & Monfre, 2015). According to the 2014 International Hill-Rom Prevalence Survey of 104,485 patients, prevalence of hospital-acquired PUs in acute care settings was 3.8% overall, but higher incidences occurred in Spinal Cord Units (10.7%) and Critical Care Units (8.6%) with reports remaining consistently between 4.7% in 2010 to 3.7% in 2012 (Cano et al., 2015). However, lack of standardization, including faulty diagnosis of wounds that developed

before admission, creates limitations where inconsistent data collection for PUs can render unrealistic comparisons of prevalence between small and large institutions, and in bigger medical centers, a higher patient acuity may equate to greater occurrence, not lack of prevention (Brindle, Creehan, Black, & Zimmerman, 2015).

Summary of Causes

AE such as PUs are complicated by extrinsic and intrinsic factors, and health professionals must be involved in prevention strategy (Bandeira et al., 2014). Critically ill patients in the ICU are at risk of PUs because of circulatory impairment due to immobility, hemodynamic instability associated with abnormal blood pressure, vasopressor or blood vessel constriction, diminished sensory perception, and organ failure; also, wound development and AE vary depending on the institutional setting (Krupp & Monfre, 2015; Pinkney, 2014). Respiratory equipment and vasoactive agents for hypertension are barriers, which may lead to unforeseen complications related to repositioning and execution of acute care guidelines (Cooper, 2013). The cost of treating AE involving PUs is 2.5 times more expensive than prevention strategies and has helped to create a financial crisis in healthcare (Talsma et al., 2011). The entire healthcare system is impacted when high-risk individuals are involved in an AE due to lack of acute care PU prevention guideline efficiency or simple improper patient repositioning (Garcia-Fernandez, Pancorbo-Hidalgo, & Agreda, 2014).

Pressure Ulcer Guidelines

Advice for PU guidelines begins with evaluation and management of skin and tissue with risk assessment followed by prevention, and treatment. High-risk areas of the

body such as the sacrum, ischium, heels, or elbows should earn priority evaluation (Cooper, 2013; Coleman, 2013; Zeller, Lynn, & Glass, 2006). Groups who are more susceptible to PUs are SCI, QI, elderly individuals, people in the ICU, and surgical patients (Johansen et al., 2015) along with demographics of Hispanic ethnicity, black race, lower body weight, cognitive impairment, poor nutrition, and conditions that affect the integrity of soft tissue, such as incontinence (Qaseem et al., 2015). The guidelines for PU prevention and treatment are meant for every level of the medical profession, and many clinical specialties may be involved such as dermatology, geriatrics, nursing, nutrition, and plastic surgery (AHRQ, 2016; CDC, 2015). The goal of these guidelines is to create cost effective patient outcomes and to stimulate research on the subject (AHRQ, 2016).

Guideline Development

There are several sources of quality guidelines for pressure ulcer prevention and treatment. Guidelines were developed by the National Pressure Ulcer Advisory Panel after four years of collaboration with the European Pressure Ulcer Advisory Panel (NPUAP, 2009). The AHRQ National Guideline Clearinghouse (AHRQ, 2016) published their newest version of PU guidelines based on a version provided by the Wound, Ostomy, and Continence Nurses Society (2016). The AHRQ also published a comparative effectiveness and treatment strategy outlining the scope of the PU issue (AHRQ, 2013). The CDC has published guidelines from resources such as the U.S. National Library of Medicine and the Institutes of Health in conjunction with the National Nursing Home Survey (CDC, 2015). Each of these versions has utilized current

research, multiple sources of data, and hospital and nursing home statistics (AHRQ, 2016; AHRQ, 2013; CDC, 2015; NPUAP, 2009). PU guidelines were developed expressing evidence-based practice using methodology of identifying the evidence, determining inclusion criteria, evaluating direct and indirect observation, drafting recommendations, and providing strength categories to the findings (AHRQ, 2016; AHRQ, 2013; CDC, 2015; NPUAP, 2009).

QI Involvement with Guidelines

NPUAP (2009) examined gaps in analysis and gathered data from various stakeholders including SCI and QI, children, critically ill individuals, bariatric patients, and those in palliative care, allowing all interested parties to follow the process online. The AHRQ (2016) retrieved data from multiple sources, demographics, and settings to develop the present guidelines. The CDC (2015) evaluated statistics and data from the elderly, the disabled and the critically ill to develop the current PU guidelines. Knowledge from SCI or QI can support evidence for teamwork in acute care settings (Latimer et al., 2014), and McInnes et al. (2014) state patient understanding will help create improved PU guidelines and prevention. However, Marin et al. (2014) speculate that SCI were not adequately represented during development of PU prevention and treatment strategies.

Effectiveness of Guidelines

PUs have been reported on the increase through 2006 (Zaratkiewicz et al., 2011) mainly due to complications with treatment in the ICU (Bandeira et al., 2014). Assessment tools have been used to determine which individuals may be at risk for PUs,

but moderate quality evidence shows that the Braden, Norton, Gosnell, Cubin and Jackson, Waterlow, and Ramstadius scales are no more efficient than clinical judgment, with little difference existing between them (Qaseem et al., 2015). Prevention of PUs has involved various avenues such as use of specialized equipment and utilization of evidence-based practices (Ackroyd-Stolarz et al., 2014; FRI, 2013), but providing mobility to at-risk patients and regular repositioning according to the acute care guidelines has proven the most effective deterrent (AHRQ, 2016; CDC; 2015; NPUAP; 2009; Schofield, Porter-Armstrong, & Stinson, 2012; Talsma et al., 2011). Innovations and progress show little improvement has been seen with the use of the acute care guidelines over the last 20 years (Black et al., 2015). However, the most cost effective and clinically sound intervention is a multi-component approach of standardization, multidisciplinary teams, and patient feedback based on evidence-based use of acute care guidelines (Qaseem et al., 2015). Unfortunately, research related to acute care PU guidelines are difficult to translate into clinical practice which is a challenge requiring a concurrent, directed effort, but some SCI networks have improved mobilization of prevention using frameworks driven by staff competency, organizational support, and leadership through stages of exploration, installation, and accent on initial focus culminating in full implementation (Scovil et al., 2014).

Guideline Usage

The first step in PU guideline protocol is to evaluate prominent risk areas of skin with one of the assessment scales (Cox, 2011; Warner-Maron, 2015). Once the evaluation is completed clinicians should take the appropriate action to either prevent PUs or to

begin the healing process (AHRQ, 2016; CDC, 2015; Cox, 2011). Many of the same techniques are used for prevention and treatment, such as repositioning (AHRQ, 2016; CDC, 2015; Cox, 2011). If PUs are already developed, the assessment professional should contact the necessary medical specialists and begin treatment strategies (AHRQ, 2016). Clinicians must use proper repositioning technique by relieving pressure on the wound and turning the patient every two hours to instigate healing (CDC, 2015). Additionally, healing should be improved by keeping the tissue clean, using special supportive surfaces, and application of skin barriers as needed (CDC, 2015). The act of repositioning, relieving pressure, and diminishing friction/shear are the main preventive measures according to guidelines (AHRQ, 2016; CDC, 2015; Cox, 2011). Besides repositioning, clinicians aim to reduce or control bowel and bladder incontinence problems to minimize moisture, while protecting the wound by providing preventive barriers (AHRQ, 2016).

Assessment Tools for Pressure Ulcers

There are multiple assessment scales used to predict PUs by clinicians and some widely used scales include: (a) the Norton Scale which consists of the five parameters of physical condition, mental state, activity, mobility, and incontinence with scores between five and 20 where 14 and below indicate risk (Torra i Bou et al., 2006); (b) the Gosnell Scale which has subgroups of mental status, continence, mobility, activity, and nutrition scoring from five to 20 with 16 and below predicting at risk (Torra i Bou et al., 2006); (c) the Waterlow Scale which has subgroups of body mass index, sex, age, tissue perfusion, neurological compromise, extent of surgery, mobility, and medications with greater that

20 being high risk (Thom et al., 2013); (d) the Braden Scale which has six subscales of sensory perception, moisture, activity, mobility, nutrition, and friction/shear where the total score is between six and 23 with lower than 15 indicating necessary prevention and 10 to 12 being high risk (Braden & Bergstrom, 1994). According to Bergstrom, Braden, Kemp, Champagne, and Ruby (1988) assessment upon admission is important in order to implement planning strategies, and ongoing evaluation is recommended to fine tune the protocol within 48 to 72 hours; because this is a crucial time for development of a care plan. The Braden Scale is the preferred PU assessment tool currently (Warner-Maron, 2015). According to Torra i Bou et al. (2006), the most validation is given by assessment with the Braden Scale, followed closely by the Norton Scale. The Braden Scale (one of the most widely used in the United States) appears to express the best validity and reliability compared to other clinical observations (Hyun, S. et al., 2013), showing viability across different settings (Warner-Maron, 2015). A study in Japan, where the Braden Scale is widely used, showed the use of regular admission data for gender, age and surgical duration, supported by preferred assessment tools, could successfully predict PUs (Nakamura et al., 2015). Therefore, a detail of the Braden Scale will be provided below to provide an overview of assessment tool usage and evaluation characterizing clinician risk management for PU prevention.

The Braden Scale

The Braden Scale is the work of Barbara Braden and Nancy Bergstrom from their 1987 research (Cox, 2011). According to Braden and Bergstrom (Bergstrom et al., 1988) PU prevention starts with proper assessment, and six subscales are pointed out (Cox,

2011; Hyun et al., 2013; Kinsley, 2014; Warner-Maron, 2015) that should offer an appropriate evaluation of the risk factors. The six subscales are sensory perception, mobility, moisture, activity, nutrition, and friction/shear (Cox, 2011, Kinsley, 2014). Each subscale of the Braden Scale has one to four possible points except for friction/shear which may get one to three points allowing a high score of 23 total and a low score of six where preventive PU measures should begin at a score of fifteen and where a score of 10 to 15 would be a high-risk assessment (Cox, 2011, Kinsley, 2014). Limitations exist within the scale for critical care patients who may endure a prolonged stay in ICU, individuals with advanced age, low arteriolar pressure, severity of illness, and conditions like diabetes, sepsis, and vascular disease (Cox, 2011). Additionally, the Braden Scale fails to assess some patients with respect to the sensory aspect according to different types of moisture such as urinary or fecal factors. Other factors that may alter indicators are respiratory issues and bed elevation, history of previous wounds causing future susceptibility, and bed bound individuals being at a higher risk (Warner-Maron, 2015). According to Cox (2011), only the Braden subscales of mobility and friction/shear were sufficient indicators of PUs where repositioning was a priority but added that glide sheets help diminish rubbing factors. Nevertheless, the Braden Scale is widely accepted by clinicians and professionals in the United States (Hyun, S. et al., 2013; Torra i Bou et al., 2006; Warner-Maron, 2015).

Braden Subscales

Sensory Perception is the ability to respond to pressure related discomfort. *Completely Limited* (with a score of 1) indicates the patient does not moan, flinch or gasp

to painful stimuli. *Very Limited* (with a score of 2) is if the patient responds only to painful stimuli and cannot communicate discomfort except by moaning or restlessness. *Slightly Limited* (with a score of 3) indicates the patient responds to verbal commands and communicates discomfort or the need to be turned. *No Impairment* (with a score of 4) is given if the patient responds to verbal commands and has no sensory deficit (Bergstrom et al., 1988; Cox, 2011; Kinsley, 2014; Warner-Maron, 2015).

Mobility is the ability to change and control body position. *Completely Immobile* (with a score of 1) indicates need of assistance to change body position. *Very Limited* (with a score of 2) indicates ability to make slight changes in body position, but the patient will need assistance to make frequent or significant changes. *Slightly Limited* (with a score of 3) indicates ability of the patient to make frequent slight changes in body position independently. *No Limitations* (with a score of 4) indicates the patient can make frequent body positions without assistance (Bergstrom et al., 1988; Cox, 2011; Kinsley, 2014; Warner-Maron, 2015).

Moisture is the degree to which the skin is exposed to moisture. *Completely Moist* (with a score of 1) is when the skin is constantly moist. *Very Moist* (with a score of 2) is when the skin is often but not always moist. *Occasionally Moist* (with a score of 3) is when the skin is occasionally moist, and linens need to be changed once a day. *Rarely Moist* (with a score of 4) is when the skin is usually dry (Bergstrom et al., 1988; Cox, 2011; Kinsley, 2014; Warner-Maron, 2015).

Activity is the degree of physical activity. *Bedfast* (with a score of 1) is categorized as confined to bed. *Chairfast* (with a score of 2) is categorized as able to

walk but severely limited. *Walks Occasionally* (with a score of 3) is categorized as walking very short distances without assistance but spends the majority of the time in a chair or bed. *Walks Frequently* (with a score of 4) is categorized as walks outside the room at least twice a day and inside the room every 2 hours (Bergstrom et al., 1988; Cox, 2011; Kinsley, 2014; Warner-Maron, 2015).

Nutrition is the usual food intake pattern. *Very Poor* (with a score of 1) is when a complete meal is never eaten, and the patient only eats protein once or twice a day with poor fluid consumption. *Probably Inadequate* (with a score of 2) is when a complete meal is rarely eaten, and the patient only eats half of anything that is offered. *Adequate* (with a score of 3) is when over half of most meals are eaten. *Excellent* (with a score of 4) is when most of every meal is eaten (Bergstrom et al., 1988; Cox, 2011; Kinsley, 2014; Warner-Maron, 2015).

Friction/Shear is rubbing of the skin against other surfaces and could be caused by raising or lowering a bed or by muscle spasms. *Problem* (with a score of 1) is when moderate to maximum assistance is required for moving. *Potential Problem* (with a score of 2) is when minimum assistance is required for moving. *No Apparent Problem* (with a score of 3) is when movement in the bed and in a chair is independent (Agrawal & Chauhan, 2012; Antokol et al., 2012; Bergstrom et al., 1988; Cox, 2011; Johns Hopkins Medicine [JHM], 2016a; Kinsley, 2014; National Pressure Ulcer Advisory Panel [NPUAP], 2014b; University of Washington [UW], 2016; United Spinal Association [USA], 2016; Warner-Maron, 2015).

Pressure Ulcer Staging

In 2009, the National Pressure Ulcer Advisory Panel and the European Pressure Ulcer Advisory Panel defined a PU as a localized injury to skin or underlying tissue over a bony prominence due to pressure that is sometimes combined with the effects of shear, friction, or movement across surfaces (AHRQ, 2016). Suspected deep tissue injury begins with a purple or maroon localized area of discolored intact skin or a blood-filled blister caused by pressure or shear and may be preceded by a mushy warmer or cooler adjacent area (Cox, 2011). PUs are categorized by stages, and these stages are described as Stage I, Stage II, Stage III, Stage IV, and unstageable (AHRQ, 2016; Black et al., 2007; CDC, 2015; Edsberg, et al., 2016).

- *Stage I* consists of an intact, non-blanchable redness of skin (an area that does not briefly lighten); however darker skin may not blanch (AHRQ, 2016; Black et al., 2007; CDC, 2015; Edsberg, et al., 2016).

- *Stage II* consists of partial loss of the dermis that manifests as a shallow ulcer or wound which is red and may appear as an open blister (AHRQ, 2016; Black et al., 2007; CDC, 2015; Edsberg, et al., 2016).

- *Stage III* consists of loss of full-thickness of skin which may expose some fatty tissue with possible slough (yellow, tan, gray, green, or brown) (AHRQ, 2016; Black et al., 2007; CDC, 2015; Edsberg, et al., 2016).

- *Stage IV* consists of full-thickness tissue loss exposing bone, tendons, and muscles with slough or eschar (tan, brown, or black) possible and may include

undermining or tunneling into the surrounding area (AHRQ, 2016; Black et al., 2007; CDC, 2015; Edsberg, et al., 2016; Senthikumaran, Balamurgan, Karthikeyan, & Thirumalaikolundusubramanian, 2010).

- *Unstageable* consists of full-thickness tissue loss in which the wound is covered with slough or eschar (AHRQ, 2016; Black et al., 2007; CDC, 2015; Edsberg et al., 2016).

Pressure Ulcer Prevention

Reducing pressure on potentially impacted areas of the body such as the sacrum, ischium, elbows and heels is essential to prevent PUs (Coleman, 2013; Cooper, 2013; Zeller et al., 2006). At-risk individuals are advised to reposition every 10 to 15 minutes while sitting and every 2 hours while in bed (Schofield et al., 2012). The use of proper equipment and repositioning with sufficient personnel is a prime focus regarding PUs in facilities (Cooper, 2013). Physical repositioning is crucial for SCI, QI, and at-risk groups; because serious complications and death are possible due to PUs in these vulnerable populations (IOM, 2013). Researchers express concern about insufficient repositioning in hospitals for older patients, males, and bedridden individuals who may not get attention during the night shift, who change their own position between turns, or who receive no assistance (Latimer et al., 2015). Biomedical engineered systems were developed for beds and wheelchairs to diminish problems of pressure on sensitive areas of the body (Linder-ganz, Yarnitzky, Yizhar, Siev-ner, & Gefen, 2009), and Chou et al. (2013) postulate that the effectiveness of advance static, low air-flow, and alternating-air mattresses exceeds standard hospital bed systems for PU prevention; while, Tung et al. (2015) advocate

education, self-management, and the use of technology to prevent occurrence of PUs. Additionally, patient migration in elevated beds from head to foot is a concern for PU development because of shear or friction, and researchers have sought new designs to overcome this issue (Kermit, & Kotowski, 2015). Ultimately researchers show that the use of good guidelines with proper execution in acute care settings, sound clinical judgement, and proper supportive surfaces do help prevent the occurrence of PUs and this AE (Chou et al., 2013; Park-Lee & Caffrey, 2009).

The use of risk assessment scales is recommended in prevention guidelines to create increased proficiency of clinical judgment with the goal of improving effectiveness of interventions (Krupp & Monfre, 2015). Preventive measures also include convoluted foam pads, skin barriers, and heel pads (Bandeira et al., 2014), but overall, repositioning proves to be the most cost effective and efficient means for relieving pressure on the ischium and sacrum (Schofield et al., 2012). Even though many incidence studies exist, prevalence of PUs continues unchanged; therefore, patients must not be getting the appropriate preventive care, proper assessment, repositioning, chair and bedding surfaces, and/or nutrition (Johansen et al., 2015; Sullivan, 2013).

Staffing and Pressure Ulcers

Staffing issues related to repositioning should be directly addressed, but further research is needed to investigate lack of workforce related to PU development (Cooper, 2013). A major concern exists because understaffing remains a crucial concern related to patient outcomes (Dunton et al., 2007). Good documentation by hospital staff can diminish the rate of PU occurrence (Sailor, White, Boldt, Post, & Lay, 2013), and

according to Talsma et al., (2011), a structured daily approach by nurses with attention to detail supported by electronic medical records (EMR) were a successful prevention of AE. Still problems in hospitals and facilities occur during the delivery of acute care in which there is not enough staff to efficiently follow guidelines (Lang, Hodge, Olson, Romano, & Kravitz, 2004). Lucero, Lake, and Aiken (2011) state staffing issues cause unmet nursing care duties, which can lead to AE such as medication errors, patient falls, and nosocomial infections. Pinkney (2014) propose PUs can develop due to either patient health or behavior or quality of care and treatment, but their multiple case study uncovered a strong likelihood of (a) clinicians failing to listen, (b) inability of staff to recognize or respond to clear signs, or (c) services rendered improperly which led to the development of PUs in acute care settings. In a National Institute for Health (NIH) study which strongly advocates regular repositioning to prevent PU, nurses may have ignored patient indicators of pain prior to wound development (Madden, 2015). Francke (2008) proposes that business decisions and personal reasons have led organizations or staff to ignore recommended protocol. It is unclear whether failures concerning repositioning during hospitalization is due to lack of staff or just plain oversight (Lang et al., 2004), but it is evident that there is a problem concerning hospital-acquired PUs.

Health professionals use objective and standardized indicators for quality of care assessment to avoid legal liability and prevent AE like PUs (Bandeira et al., 2014). Evaluation using assessment tools such as the Braden Scale impacts outcome positively, but nursing workload (based on review of nursing activity scores) is identified as a risk factor for PU development (Krupp & Monfre, 2015). According to Cano et al. (2015), an

increase of three or four nurse assistants to accomplish regular turns for bedridden patients proved to be a beneficial protocol, maximizing the repositioning effort. Sullivan (2013) states turn-team nursing, education interventions, and tracking systems executed as bundles of multifaceted care activities can produce positive outcomes for PU prevention; while, Johansen et al. (2015) propose that competency of staff, quality of care, and focus on lack of efficient beds and mattresses are important elements that must be addressed in acute care settings. The World Health Organization identifies human error as a worldwide problem leading to AE; even though detailed records of patient care are kept by clinicians (Bandeira et al., 2014). It is feasible the occurrence of PUs may be due to staff miscommunication within medical teams during intense acute care activity (Raingruber, Teleten, Curry, Vang-Yang, Kuzmenko, Marquez, & Hill, 2010), but the possibility exists that something as simple as proper routine repositioning for vulnerable populations may be overlooked due to understaffing (Lang et al., 2004).

Pressure Ulcer Treatment

Upon admittance to a hospital or a facility the patient should be assessed for PUs, and the period of the first week should be a time of hypervigilance of prevention and continued assessment (Cox, 2011). PUs can be difficult to diagnose because the wounds may mimic other deep tissue injury in the early stages such as rhabdomolysis (liquefactive deterioration of muscles), ischemia causing non-blanchable tissue, Warfarin necrosis (developing a few days after beginning usage), calciphylaxis (calcification of blood vessels leading to skin wounds), necrotising fasciitis (inflammation of a muscle or organ sheath), and incontinence-associated dermatitis (Black et al., 2015). Purpuric

dermatosis (non-blanchable purple tissue) occurs 24 to 72 hours after a pressure event; then 24 to 48 hours later purple sloughing of epidermis occurs, and subsequently, the ulcer completely develops in seven to ten days later (Ayello, 2014; Black et al., 2015; Black et al., 2007; Cooper, 2006; Kohta, Sakamoto, Kawachi, & Oh-I, 2015; NPUAP, 2014b; Sharp & McLaws, 2005). Stage I and Stage II wounds may heal in several weeks with monitored care, but Stage III and Stage IV PUs will require special prolonged treatment due to possible complications (AHRQ, 2016; CDC, 2015). Also, McGinnis et al. (2014) documented the need for pain assessment related to PUs, especially for individuals with dark skin, citing two types of pain: (a) nociceptive caused by inflammation (b) neuropathic from nerve damage or tissue ischaemia, and they showed wound patients in the community and the hospital experienced both conditions, which could indicate precursory injury.

PU complications include infection that sometimes occurs when bacteria burrows into areas around a wound causing sepsis or bacteria in the blood stream that may create organ failure, cellulitis or an infection of skin, connected soft tissue, bones and joints (AHRQ, 2016; CDC, 2015). Induration of PUs may occur, which is abnormal hardening of tissue caused by consolidation of edema indicating underlying infection (JHM, 2016a; NPUAP, 2014b). PUs may undergo tunneling and undermining indicating tissue destruction below the tissue surface and beyond the edges of the wound creating further complications and possibility of infection (JHM, 2016a; NPUAP, 2014b; Wake, 2010; Miura, Ito, Matsuda, Abe, & Kitaba, 2013). Once a PU develops, hundreds of bacteria may be present further complicating treatment (Smith et al, 2010); also, bacterial

complications can create tissue impairment which can lead to serious infections such as Fournier's gangrene (necrosis of the perineum) or sepsis causing a high mortality rate (Alvarez et al., 2010; Backhaus et al., 2011; Rubayi, 2015). Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to an infection (Johns Hopkins Medicine [JHM], 2011). The definition of sepsis was re-evaluated recently to reflect advances in pathobiology describing Sequential (Sepsis-related) Organ Failure Assessment (SOFA) as a score of two points or more associated with an in-hospital mortality rate greater than 10 percent (Singer et al., 2016). Septic shock is classified as abnormal circulatory, cellular, or metabolic influences which increase the risk of mortality even more (Singer et al., 2016). Sepsis is also considered destructive or pathological systemic inflammatory response to infection (Chou et al., 2015; Cox, & Roche, 2015; JHM, 2011; Lin, 2015; Rubayi, 2015; Schiffman, Golinko, Yan, Flattau, Tomic-Canic, & Brem, 2009; Singer et al., 2016). PU complications especially in individuals with co-morbid conditions like SCI, dementia, stroke, or acute illness may lead to a greater risk of sepsis (JHM, 2016a; NPUAP, 2014b). Surgical procedures like debridement of necrotic tissue of ulcer wounds may help to prevent the increased development of bacteria and infection, which can lead to septic shock because PUs are the most likely condition to develop polymicrobial organisms which lead to sepsis (AHRQ, 2016; CDC, 2015; JHM, 2011; Schiffman et al., 2009;). Exudate which is fluid forced out of tissue or capillaries due to inflammation or injury may contain serum, cellular debris, bacteria, or leukocytes and is considered liquefied necrotic material characterized by watery, clear, pink, yellow, or tan separate from the blood which may

indicate infection producing uncontrollable odor (NPUAP, 2014b; Burt, 2013). Additionally, squamous cell cancer can potentially develop from non-healing wounds requiring surgery (CDC, 2015). Ultimately, PUs are difficult to treat, creating an interference in lifestyle for patients, so according to Warner-Maron (2015), occurrence of pressure wounds have become a quality of care issue for hospitals and long term care facilities and should receive immediate attention upon recognition to prevent complications.

Hospital-Acquired Wounds

If a PU develops in a facility or a patient arrives with a wound, treatment should begin with regular repositioning, the use of a low-air-loss or air fluidized surface, and pressure relief followed with a treatment strategy developed by primary care physicians and clinicians (AHRQ, 2016). A wound care physician should become involved and nurses, nutritionists, physical therapists, social workers, and possibly surgeons should help evaluate and assess treatment strategies (CDC, 2015). Bowel and bladder management should be implemented immediately to control and/or reduce incontinence, and wound cleansing should begin by using sterile water or salt water with every dressing change (AHRQ, 2016). Cleansing is a priority to prevent infection while dressings keep the wound moist and provide a barrier helping the surrounding area remain dry (CDC, 2015). Dressing choices include films, gauzes, gels, foams, treatment coverings or adjunctive combinations of dressing material with final decisions relying on severity of the wound, amount of bodily discharge, and ease of placement (CDC, 2015).

Treatment Strategy

A biopsy or quantitative swab technique should be used to determine the bacterial bioburden (AHRQ, 2016), and blood tests can survey the general health of the patient (CDC, 2015). In order to heal properly, a PU should be cleared of damaged, dead or infected tissue which can be done by debridement of the wound that removes unhealthy substances (CDC, 2015). Surgical debridement is used to cut away dead tissue; mechanical debridement loosens wound debris and helps to irrigate the area; autolytic debridement enhances natural body processes by using special dressings to keep smaller uninfected ulcers moist; and enzyme debridement involves using chemicals and coverings to break down damaged epidermal materials (Diaz, Li, Rodriguez, & Salgado, 2013; Duci, S. et al., 2013; JHM, 2016a; NPUAP, 2014b).

A 2 week antibiotic regimen of topical treatment may be used, but in the presence of bacteremia, sepsis, cellulitis or osteomyelitis, a systematic pharmacological plan will be incorporated (AHRQ, 2016). Also, pain management, a healthy diet, and muscle spasm relief proves to be an impactful part of the strategy (CDC, 2015). Other treatments may include negative pressure therapy (a vacuum assisted closure that applies suction to evacuate and heal a wound), platelet derived growth factors (proteins that regulate cell growth), and electrical stimulations (AHRQ, 2016). Above all, the wound should be reassessed during each dressing change to determine if the wound has deteriorated or if the strategy should be modified (AHRQ, 2016).

The wound care team will make decisions about the possibility or necessity for operative procedures that are available (AHRQ, 2016). Surgical procedures aim to

improve hygiene, appearance of the wound, prevent infection, reduce fluid, and diminish cancer risks (CDC, 2015). Surgeons will decide if the wound has scar tissue from a previous operation, and depending on the location of the sore, a pad of muscle or skin called a flap reconstruction may be used to cover the area to protect and cushion affected bone (CDC, 2015). Before surgery, the patient, wound care team, family, and care providers will exercise all treatment and preventive options, and it is the goal of a PU strategy team to improve wound therapy education for all parties involved (AHRQ, 2016; CDC, 2015). Wound care specialists aim to provide PU intervention and prevention while promoting healing by incorporating all tools of medical science and technology, combining strategies known as adjunctive therapy when appropriate (AHRQ, 2016). For this reason, community dwelling individuals who are at risk for PUs should exercise all preventive or treatment measures and seek professional assistance immediately when faced with occurrence of a wound (AHRQ, 2016; CDC, 2015). Also, community dwelling SCI with PUs or those released from the hospital should receive treatment and prevention according to a Chronic Care Model of self-management, provider interactions, support to help to facilitate acute care guidelines, and timely data availability from information systems (Guihan et al., 2014).

SCI Quality of Life

SCI and QI struggle daily to maintain a routine of hygiene, nutrition, and physical wellbeing, which usually involves assistance for dressing, eating, toileting, grooming, and range of motion (FRI, 2013; Ghavam et al., 2014; Hammell, 2007). SCI experience an increased level of secondary health conditions such as PUs, pain, autonomic

dysreflexia, bladder, and bowel problems, muscle spasms or spasticity, fatigue, esophageal symptoms, and osteoporosis (Jensen et al., 2013; Sezer, Akkus, & Uğurlu, 2015). One part of the daily routine for SCI and QI is to use repositioning technique, special equipment, and pressure relieving cushions and beds to prevent the occurrence of PUs (FRI, 2013; Gefen, 2014). SCI are further challenged to acquire proper wheelchairs and sitting cushions to achieve efficient tissue-loading related to micro-changes in the body due their injury in order to prevent PUs (Gefen, 2014). Scovil et al. (2014) state that 15% of all SCI develop a pressure ulcer in the first year after injury with probability increasing each year; 85% acquire a deep tissue wound in their life; and 7-8% of deaths for this demographic are due to PUs. Researchers show that 36% of SCI are rehospitalized at least once within the first year of injury because of urinary tract infection, respiratory conditions, or PU (DeJong et al. 2013). According to DeJong and Groah (2015), the healthcare system should rethink SCI rehabilitation and community care to provide the right care based on data, and additionally state, the Affordable Care Act may render new avenues; since most of these individuals are not Medicare eligible. Furthermore, prevention of PUs incorporating education, repositioning, and skin care is a lifelong commitment for SCI (Rathore & Mansoor, 2012). Therefore, disruptive routine, decay in preventive behavior, and inadequate equipment are additional risk factors for SCI who must be treated in acute care settings (Ghaisas et al., 2015).

Age and duration of injury are factors in quality of life for SCI, and the chronological age of the individual at the time of injury is also a consideration related to the impact of daily routine (Jensen et al., 2013). Research has been done to determine and

compare functionality among the different levels of SCI to show how motor impairment is associated with quality of life limitations related to mobility, self-care, and communication (Herrmann, Kirchberger, Biering-sørensen, Cieza, 2011). Ultimately, higher frequency of cardiovascular disease, diabetes, PUs, bone mineral density loss, fatigue, respiratory problems, and infections hinder quality of life for SCI (Jensen et al., 2013; Sezer et al., 2015).

Daily Routine

Researchers show that lifestyle choices and daily routine affect the development of PUs in SCI (Ghaisas et al., 2015). Along with PU risk factors, SCI are greatly challenged daily by bowel management due to lack of mobility and sphincter control which becomes a life-limiting problem accented by nutrition, dietary fiber intake, suppositories, abdominal massage, and stimulation (Krassioukov, Eng, Claxton, Sakakibara, & Shum, 2010). Also, bladder management is crucial to quality of life and PU prevention for SCI, who incorporate preservation of the upper urinary tract, minimization of lower system complications, and creation of compatibility with lifestyle by use of indwelling catheterization or external catheters while attempting to diminish the risk of infections (Linsenmeyer et al., 2006). SCI prioritize bowel management to prevent fecal incontinence (Krassioukov et al., 2010) and bladder control to avoid urinary produced moisture problems (Linsenmeyer et al., 2006) with a goal of diminishing the risk of PUs (Jensen et al., 2013). Due to the nature of the injury, mobility issues are a constant challenge for SCI and QI; because, serious complications including PUs may

develop from any lack of improper repositioning or absence from special equipment such as pressure relieving beds (Munce et al., 2014).

Other Considerations

PUs, autonomic dysreflexia, fecal incontinence, bladder problems, muscle spasms, and heterotropic ossification (defined as bone in soft tissue where it does not normally exist) are exacerbated for SCI and QI (Jensen et al., 2013; Sezer et al., 2015). Autonomic dysreflexia is a life-threatening condition for SCI in which a PU, injury, infection, or pain creates changes in blood pressure and body temperature when stimulus below the point spinal injury causes vasoconstriction leading to vasodilation above the lesion, evolving into physical trauma (headache, flushing, sweating, and nasal congestion), mental trauma, hospitalization, or death (Pannek, Gocking, & Bersch, 2010; Sezer et al., 2015). All of these factors are life altering and a continuous focus for the SCI and QI population (FRI, 2013; Ghaisas et al., 2015; Ghavam et al., 2014; Jensen et al., 2013; Krassioukov et al., 2010; Linsenmeyer et al., 2006; Sezer et al., 2015).

Psychosocial Elements

Psychological, physical, and social elements affect the health and quality of life for SCI, who are attempting to prevent PUs by using the acute care guidelines (Ghaisas et al., 2015). The occurrence of PUs disrupt the lifestyle of SCI by interfering with work, school, and community activity (Hsieh et al., 2014), and due to procrastination or social discomfort, SCI may not seek treatment for skin issues which may worsen the outcome of PU development (Ghaisas et al., 2015). Initial injury for SCI and QI has physical implications, but psychological injury is impactful as stages of loss such as shock, anger,

denial, and depression, frequently leading to developmental processes after an injury exemplified by relearning basic trust and autonomy, and these factors may be followed by individual differences affecting patient personality in the form of blame or depression (Martz, Gontkovsky, Stokic, & Livneh, 2010; Westie, 1999). SCI are faced with emotional challenges and lifestyle changes that affect family, friends, care providers, and the community as their worldview is seen through the eyes of post-traumatic stress disorder (PTSD) and pain management, which is eventually compounded by the presence of the additional psychological injury *(*Huston et al., 2011). Psychologically and psychosocially these elements of trauma may have an impact during any visit to an emergency room or facility by SCI or QI (Huston et al., 2011), who are suddenly facing a change in daily routine surrounded by worry and anxiety combined with knowledge of potential for secondary complications such as PUs (Ghaisas et al., 2015; Munce et al., 2014).

Strengths and Weaknesses of Previous Studies

Strengths

Much research has been done on the subject of PU causes, prevention, and treatment (Black et al, 2015; Eslami et al., 2012; Jensen et al., 2013; Marin et al., 2013). Researchers approached this complex condition from scientific experimentation based on quantitative study to evaluate ways to prevent community and hospital-acquired PU development (Black et al; 2015; Coleman, 2013; Eslami et al., 2012; Johansen et al; 2015). The strengths of these studies provide a base of knowledge showing the multi-factor risk categories for PUs and led to prevention strategies, assessment tools, and

treatment plans (AHRQ, 2016; Braden & Bergstrom, 2007; CDC, 2015; Cox, 2011; Gillespie et al., 2014; Torra i Bou et al., 2006; Thom et al., 2013; Warner-Maron, 2015). Assessment is foundational to execution of acute care guidelines, and the Braden Scale has become the strongest tool for PU evaluation; mainly because effectiveness has been identified for use by clinicians in various settings (AHRQ, 2016; CDC, 2015; Cox, 2015).

Weaknesses

Limitations exist regarding all six Braden subscales as true indicators (Cox, 2011). Cox (2011) stated that only the subscales of sensory perception, mobility, moisture, and friction/shear have become significant criteria, and Warner-Maron (2015) outlined weaknesses in the Braden Scale due to previous PU history, lack of sensory perception by dementia patients or the severely disabled, and care protocol existing in ICU settings. Quantitative research far outweighs qualitative investigation throughout literature searches using keywords like pressure ulcers, pressure wound, spinal cord injury or quadriplegia. The lack of qualitative studies points to a weakness of inadequate patient input for the formulation of guidelines along with a lack of research into patient-centered or patient participation models of care for PU prevention and treatment (Marin et al., 2013, Latimer et al., 2014; McInnes et al., 2014). Coleman et al. (2013) pointed out that patient views on risk factors for PUs can be beneficial, and Marin et al. (2014) stated that SCI have not been adequately represented in the formulation of preventive strategies further accenting weakness in PU research.

Further Studies

The review of literature on PUs and the complications that challenge patients and providers shows that a serious problem exists with hospital and community acquired PUs (Bandeira et al., 2014; Brem et al., 2010; Chan et al., 2013; Krupp & Monfre, 2015). Guidelines are clear that there are techniques to help prevent and treat PUs (AHRQ, 2016; CDC, 2015). Researchers show that SCI and QI are among the most vulnerable for development of PUs, and that the basic use of repositioning is crucial for prevention and treatment (Gillespie et al., 2014). Consequently, Cooper (2013) suggests further investigation into workforce issues related to PUs from the perspective of staffing and protocol (Cooper, 2013; Dunton, et al., 2007; Krupp & Monfre, 2015). Furthermore, SCI or QI participation in their own care is impacted by staffing issues which are out of the patient's control (Dunton et al., 2007; Franke, 2008; Lang, 2004). In addition, Marin et al. (2014) state that SCI were not adequately represented in the formulation of existing PU prevention guidelines calling for further research, and Latimer et al. (2014) and McInnes et al. (2014) postulate that SCI bring important knowledge to the hospital that can support patient-provider treatment strategies. Therefore, further research into SCI and QI knowledge about PUs through qualitative exploration to document patient-provider participative care strategies will help give a new perspective impacting the existing acute care guidelines.

Summary and Conclusions

Management and care of SCI is a complicated and compassionate service to those enduring this serious and impactful lifestyle change. Much of the knowledge about SCI

came from studies by George Riddoch, a British neurologist, who studied SCI during World War I and World War II and later joined forces with Ludwig Guttman, a German neurologist, who studied in Germany and immigrated to Oxford, England (Silver & Weiner, 2012). Riddoch paved the way for understanding of bladder management including catheterization, the life-threatening impact of autonomic dysreflexia, and PUs which he knew could be relieved by repositioning and could lead to sepsis if not monitored (Silver & Weiner, 2012). A century later and volumes of studies completed, the medical community is still grappling with the impact and complications of PUs and the effects on SCI, QI, the elderly, and other vulnerable populations (Black et al., 2015; Eslami et al., 2012; Jensen et al., 2013). Prevention and treatment of PUs has gained from research but repositioning of the patient is still the main deterrent (Bandeira et al., 2014; Coleman, 2013; Talsma et al., 2011). For this reason, the present study seeks to accent repositioning of patients as a PU preventative and re-evaluate existing acute care guidelines while incorporating the in-depth knowledge of SCI and QI personal experience with the goal of supporting patient-provider participation to improve protocol (see Bandeira et al., 2014; Coleman, 2013; Talsma et al., 2011). After a thorough review of literature about PUs and the impact on SCI and QI, it is evident that the majority of studies are quantitative. Therefore, it is a priority to gain insight from SCI and QI through qualitative investigation so their unique knowledge can be incorporated into prevention and treatment strategies and help fill a gap in the literature (see Marin et al. 2013). It is from this viewpoint this study will utilize the concepts of mechanism, context, and outcome incorporated in the research questions to discern the QI perspective of the PU

prevention issue. Assessment tools are important, but there are limitations, and researchers show perhaps only the subscales of mobility and friction/shear are true indicators of PU development (Cox, 2011), and good clinical judgment may be equivalent to these inspections (Qaseem et al., 2015). The use of assessment tools can be used to indicate a patient's general susceptibility (Warner-Maron, 2015). However, the present study focuses on the most vulnerable population of SCI and QI (see Jensen et al., 2013), and it is the stance of this investigation that these individuals should always receive priority care the moment they reach a hospital or facility (see Johansen et al., 2015; Krupp & Monfre, 2015). In other words, there can be no margin for error with SCI or QI for PU evaluation, and there can be no lapse of judgment due to administrative or staffing issues for any patient (see Dunton et al., 2007; Francke, 2008; Lang et al., 2004; Sailor et al., 2013). Also, any at-risk patient should receive detailed evaluation, and prevention or treatment should begin with the slightest indication of pressure ulcers (Cox, 2011). It is the goal of the medical community to prevent AE and serious AE (Krupp & Monfre, 2015; Rafter et al., 2014; Talsma et al., 2011), and this is why development of PUs should never occur due to simple lack of repositioning protocol (Ackroyd-Stolarz et al., 2014; Bandeira et al., 2014; Garcia-Fernandez et al., 2014). The complexity of PU development keeps clinicians, patients, and care providers from knowing exactly when a wound will occur (AHRQ, 2016; CDC, 2015). PUs begin with a blemish which can be small and benign looking (AHRQ, 2016; CDC, 2015; Cox, 2011; Edsberg, et al., 2016); therefore, every new redness or discoloration can be critical and should never be overlooked; because it could be a Stage I PU developing (Cox, 2011). If clinicians and

care providers work together with patients (a) to develop teamwork and participation in the hospital and the community, (b) relieve pressure on even embryonic wounds, and (c) reposition properly, the occurrence of PUs can be diminished drastically (see AHRQ, 2016; CDC, 2015). In Chapter 3, I will examine how the qualitative case study approach of open-ended interview questions, researcher observation, and various sources of data (see Creswell, 2013) will explore PU prevention from the perspective of quadriplegic individuals to fill the gap in the literature calling for representation by the SCI or QI population (see Marin et al., 2013), and I will explain the methodology which will reevaluate the execution and effectiveness of acute care prevention guidelines.

Chapter 3: Research Method

Introduction

The purpose of this qualitative study was to examine the effectiveness of acute care guidelines for the prevention of PUs in QI by drawing insight from various sources of data. According to Marin et al. (2013), persons diagnosed with SCI, which includes QI, were underrepresented in the formulation of PU prevention strategies. Also, information has been limited about patient views on PU development during episodes of care (Coleman et al, 2013). Therefore, this study provided a platform for QI participants to speak about prevention of PUs by using their unique perspective and insight concerning the effectiveness of existing acute care guidelines during episodes of care in order to further enlighten healthcare workers, patients, and family members with the goal of preventing AE (see Rafter et al., 2014).

Major points about the research design are explained in this chapter. First of all, the case study approach, rationale, and tradition are outlined with its relationship to the research questions, purpose, and problem surrounding the current study. My role as researcher is then highlighted by depicting all personal relationships, potential biases, and ethical issues involved with the study. In the methodology section, I identify the participants for inclusion, as well as how the sample and size of the pool were determined. Additionally, instrumentation for data collection, procedures for recruitment, and analysis of the information retrieved are described, examining support for the research questions. Issues of trustworthiness are outlined by explaining credibility, transferability, dependability, and confirmability related to external validity, internal

validity, audit trails, and relationships between the research and the researcher. Finally, objectivity has been stated as the foundation of transparency, and thus ethical issues are described surrounding Institutional Review Board (IRB) approval and documentation.

Research Design Rationale

The case study is the qualitative approach that best suits the research plan to evaluate the effectiveness of PU prevention guidelines from the perspective of QI and experiences in acute care settings. Individuals, organizations, events, programs, and processes bounded by time can be the focus of a case study (Baxter & Jack, 2008; Rudestam & Newton, 2015). This study was bounded by time, encompassing events and programs in acute care settings experienced by QI related to processes concerning execution of PU prevention guidelines (see Creswell, 2013). I collected data to answer the two research questions.

RQ1: To what extent does the mechanism of pressure ulcer prevention in acute care settings prevent the outcome of wound development?

RQ2: How does the context associated with an episode of care impact the mechanism of pressure ulcer prevention initiated in the acute care setting?

The case study was chosen for this research because the study framework involves events in people's lives, processes in the course of hospitalization, and programs within emergency rooms, hospitals, and nursing home facilities, which may help outline the context and mechanisms surrounding PU development in acute care settings (see Budgell, 2008; Creswell, 2013; Hyett, Kenney, & Dickson-Swift, 2014). The qualitative case study approach was chosen for this exploration, so open-ended inquiry could

provide a naturalistic design allowing development of themes into a detailed view of the participant perspective in real-life contexts (Creswell, 2013; Creswell, 2009; Crowe et al., 2011; Patton, 2002).

The phenomena of pressure ulcers in acute care settings questions how and why PUs develop, and aligns with the case study tradition (AHRQ, 2016; Creswell, 2013). This case study questioned events involving patient immobility, the mechanism of intervention, and the outcome of PU development in the context of acute care settings by reviewing the perspective of QI, healthcare clinicians, care providers, and family members. These insights were correlated with the analysis of various sources of data without manipulating the behavior of those involved to evaluate the research questions and the theory of protocol-based care (PBC) on which the theoretical framework was founded (see Baker, 2011; Baxter & Jack, 2008; Rycroft-Malone et al., 2010). Ultimately, the case study methodology has allowed analysis of the perspectives of QI about PUs to evaluate the performance of prevention guidelines in the social environment of acute care settings combined with utilization of researcher observations to identify themes or ideas induced from the examination of the various data collected (see Creswell, 2013; Crowe et al., 2011; Miles et al., 2014). In the next section, I have explained the role of the researcher in a case study approach and the relationship to the current evaluation of QI experiences about the event of PU development related to the execution of acute care guidelines.

Role of the Researcher

The role of the researcher in this qualitative case study was to act as an observer and the key instrument for data collection within settings frequented by the participants (Rudestam & Newton, 2015). A qualitative study utilizes interview questions, interviews, and data collection, and within this paradigm, I functioned as one perspective in the approach. To form a foundation for credibility and validity of the research, I utilized self-awareness or reflexivity characterized by understanding and a questioning discipline (Patton, 2002). As the researcher, I practiced my best observing behavior and employed patience while conducting interviews (see Creswell, 2013; Creswell, 2009; Miles et al., 2014; Patton, 2002). Also, I exhibited persistence, creativity, and a desire to communicate information within the social settings related to this study (see Janesick, 2011). My role as a researcher was responsive to the environment, interacted with surroundings, viewed situations on multiple levels simultaneously, and perceived the holistic nature of things (see Sanjari, Bahramnezhad, Fomani, Shogi, & Cheraghi, 2014). Finally, this qualitative research was characterized by visual and verbal evaluation analyzed in my words as the researcher after codes from themes and ideas were determined (see Devetak, Glažar, & Vogrinc, 2010).

The relationships in a qualitative study are crucial to observations, so in this study, the target population was given a voice while I exhibited self-examination to avoid undue influence on participants (see Hyett et al., 2014). Bias can occur at any point in the qualitative process, so I explored maximum structural variation of perspective to view samples from all sides (see Patton, 2002). Multiple views of the same data in the form of

triangulation was used in this study to develop perspectives and to check aspects of trustworthiness (see Devetak et al., 2010; Patton, 2002). I remained open to new concepts without preconceptions while remaining aware that the ideas revealed during the process were subject to change until the topic was fully explored, allowing for a deeper understanding (see Devetak et al., 2010; Patton, 2002). Although the study was not conducted in my work environment, I did not use my understanding of the quadriplegic condition to manipulate power over the participants. Also, I maintained a high moral code of conduct to overcome ethical issues such as conflicts of interest related to personal clients. Familiarity with the PU phenomenon and utilization of a multidisciplinary approach to the QI perspective supported my exploration, which was combined with good investigative skills, a non-judgmental attitude, and a sense of engagement to fully evaluate the issue (see Miles et al., 2014). Also, a detailed description of settings, observation of social environments, historical perspectives, and documentation of participant behaviors were employed in this study along with non-verbal communication, analysis of documents, and self-awareness to prevent one-sidedness from bias and improve credibility (see Patton, 2002).

Methodology

Participant Selection Logic

Participants. The key participants in this case study were chosen from the target group of QI who were geographically located within the United States because recruitment was conducted by contact with multiple nationwide spinal cord injury agencies (see Patton, 2002). The criterion for inclusion and participation in this study was

to be a quadriplegic individual who does not have a traumatic brain injury, a care provider or family member of QI, and a nurse, nurse assistant, or physician clinician. The participants helped the researcher access perspectives and knowledge from different viewpoints about PU prevention guidelines. These perspectives outlined experiences within the boundaries intrinsic to acute care settings while highlighting the chosen theory and uniqueness of the participants (see Miles et al., 2014). Factors for inclusion were delimited to (a) male or female QI, (b) caregivers or family members of quadriplegic individuals, and (c) acute care clinicians of all ethnicities with at least a high school education who speak English and who were over 21 years of age. Additionally, the length of time of spinal cord injury included adult QI who have had rehabilitation, entered personal home life, and then returned to an acute care facility to experience PU prevention guidelines. Investigation of specific topics regarding PU prevention guidelines were analyzed in detail; therefore, the participant's perspective became a valuable interpretation of broad ranges of experience involving the small group of QI and issues related to acute care settings (see Patton, 2002). As the researcher in this investigation, I made decisions about the type and consistency of the sampling process in order to gain QI, caregiver, family member, and acute care clinician perspective about the central questions and purpose of the study (see AHRQ, 2016; Creswell, 2013). Also, decisions were made in this study during the planning and formulation of sampling strategy involving comparison of groups and individuals related to convenience, design, and eventual evaluation of the information necessary to explore prevention guidelines and PU occurrence in acute care settings (see Black et al., 2015; Glaser & Strauss, 2012). This

purposive or judgment sample helped answer the research questions by exhibiting the perspective, behaviors, and experience of the QI cases selected, highlighting mechanisms, circumstances, and outcomes in programs and processes related to PU prevention guidelines executed in acute care settings (see AHRQ, 2016; Marshall, 1996; Rycroft-Malone et al., 2010). Therefore, the sampling strategy for this study focused on selected purposeful QI cases highlighting a collection of observations, interviews, and documents supported by caregiver, family member and clinician views (see Creswell, 2013). This qualitative study asked questions specific to acute care settings and PU prevention guidelines which were framed as cases from a larger population to represent the sample not as generalizations but as description, evaluation, and interpretation (see Maxwell, 2013). In this case study, I purposefully selected QI, care providers or family members of quadriplegic individuals, and acute care clinician samples rich in information focusing on these participants to illuminate the issue of immobility, visualize the phenomena of PUs, and create variation within the topic to represent the group with the condition of quadriplegia (see Harsh, 2011). As a researcher participant, I reviewed the sample for relevance, phenomena, and believability (see Miles et al., 2014) in an effort to accent PU prevention in acute care settings and the QI population (see Daly et al., 2007),

Sample Size. The sample size target was 35 cases each of QI, clinicians, and care providers or family members who were to inform the purpose of the study, focus on goals of the research, and help to create consistency (see Creswell, 2013). The number of samples were chosen because, according to Miles et al. (2014) five cases should be the minimum but Mason (2010) says that fifteen to twenty samples will allow sufficient

opportunity to identify themes. Mason (2010) further states the median number of cases in a case study is 33 based on examination of 179 case studies as part of research to determine how many participants should be minimal for each type of qualitative evaluation. Therefore, I decided on 35 cases in each category of QI, clinicians, and care providers or family members in order to aid saturation and allow for ample information to cross-reference themes (see Creswell, 2013). This case study examined the QI condition related to personal experiences in acute care settings such as an emergency rooms, events of hospitalization, or nursing home facilities, including the development of PUs related to execution of PU prevention guidelines (see Ackroyd-Stolarz, Bowles, & Giffin, 2014; AHRQ, 2016; Black et al., 2015) by extracting information from sample cases about events and behaviors to elicit detail and create analytic confidence (Miles, 2014; Patton, 2002). I created a sample, selecting for basic understanding of the population, so value could be derived from themes related to behavior and experience (see Luborsky & Rubinstein, 1995). Additionally, the sample in the present research has homogenous elements because of the small vulnerable subgroup of QI, who were involved in the case study (see Patton, 2002). This approach helped focus the design on the aspects of QI experiences with PU prevention guidelines encountered in acute care settings. The sample was designed to reflect understanding of the participants for key symbols, value, coherence, and experience, which could offer information about secondarily-acquired wounds, AE and prevention of unnecessary trauma, pain, and difficulties facing this vulnerable target population (see Creswell, 2009).

Participant Recruitment. I received approval from the IRB of Walden University before the participant recruitment process began. The IRB approval number is 10-09-17-0296679. Recruitment of QI was approached by emailing administrators of University of Washington Rehabilitation Medicine, VA Puget Sound Spinal Cord Injury Unit, and United Spinal Association seeking willing and qualified individuals, agency approval, and assistance contacting potential participants. The initial email contact to these agencies included the Research Recruitment Letter for their approval. In case a limited number of participants come forward from agency contact, I planned to attract QI participants using the snowball technique of word of mouth recruitment. After QI response from agencies, I planned to subsequently email the Research Recruitment Letter to each potential participant along with a brief introduction. I decided to wait two weeks for appropriate responses by QI. If I had not recruited 35 QI within two weeks, I planned to recontact the spinal cord agencies for assistance, and to ask all committed participants for further referrals. I planned to request permission in the QI participant Research Recruitment Letter to contact personal care providers or family members for inclusion in the interview process. The care providers or family members would be subsequently emailed a Research Recruitment Letter. I planned to recruit the clinicians by word of mouth among personal acquaintances seeking nurses, physicians, certified assistants, and home care providers whom I would email a Research Recruitment Letter based on their knowledge of PU which would help establish execution of prevention guidelines in acute care settings. I also planned to recruit clinicians in the specific departments visited by QI which would require me to obtain written approval from their employers for their

inclusion. The main criteria for inclusion in the purposive sample was to be QI without traumatic brain injury who had an experience or exposure to PU prevention guidelines offered in acute care settings (see Creswell, 2009; Patton, 2002). Inclusion criteria for clinicians was to have basic knowledge of PU prevention guidelines or association with acute care settings pointed out by QI during interviews. Care providers and family members of QI were automatically included due to their status and close relationship to the QI participants which helped corroborate knowledge of events, circumstances, and routines. Willing QI participants meeting the inclusion criteria, recruited clinicians, and care providers or family members who agreed to take part in the study were emailed the Informed Consent form stating the researcher's commitment to transparency in all phases of the process and anonymity for all individuals involved. All participants chosen were encouraged to take part in scheduled interviews and complete the requirements of the study, but each was offered the option to refuse inclusion or exit the program anytime they choose.

Saturation. The saturation point of qualitative samples is smaller than quantitative studies; because one code or item of data may ensure analysis of the framework and potentially create understanding of a topic (Mason, 2010). Furthermore, in-depth qualitative interview work is focused on how and why issues, processes, and events have occurred, subsequently, relying on inductive and emergent themes and factors rather than generalizations to a larger population (Dworkin, 2012). Data saturation supports the credibility, reliability, transferability, and validity of a study and may be demonstrated in different ways (Mason, 2010). In this study, I developed a saturation grid

(see Fusch & Ness, 2015) to document and adequately address each research question, the PU prevention guidelines, and QI experience to maximize the possibility that data clearly depicted crucial relationships of events in acute care settings as well as explanation of the theoretical concepts of mechanism, context, and outcome while illuminating the negative cases I explored (see Dworkin, 2012). These preliminary ideas were compared with each participant answer given, and once no new information was expressed, the saturation point was identified (see Fusch & Ness, 2015). The goal of this research was to demonstrate saturation by assembling detailed data on the participants along with various other sources (Creswell, 2013). Randomness is difficult to achieve, so in the present study, saturation was demonstrated through critical, unique, homogenous, purposeful samples that met the criterion of the research (see Patton, 2002). Also, in this study, the sample reached saturation by reviewing theoretically driven cases to illustrate the conditions under which the theory operated (see Miles et al., 2014). Ultimately, I developed a multiple case study to add confidence to results. I utilized triangulation with various sources of data to help achieve additional saturation and derive common characteristics among events and behaviors surrounding the topic of PU occurrence in acute care settings (see Creswell, 2013; Mason, 2010; Miles et al., 2014).

Instrumentation

There were three researcher-developed instruments incorporating interview questions designed for this study, which were based on the research questions and literature involving PU prevention guidelines. The first instrument focused on QI participants, the second was given to clinicians who are nurses, physicians or nurse

assistants in acute care facilities, and the third was presented to care providers or family members of quadriplegic individuals. Additional instruments included researcher observation and a diligent investigation of related sources of data such as historical documents from acute care settings, healthcare agency archival data, approved QI patient records, and physical evidence from QI patients.

Participants chosen for each of the three instruments were emailed appropriate date, time, and best phone number for the interviews in advance of the sessions. The interviews with all participants were presented via phone because the participants were located in various locations with the United States (see Creswell, 2013; Miles et al., 2014; Patton, 2002). Each interview was audio recorded, transcribed verbatim within three days following each session, and returned to interviewees within one week for approval and member checking while memories were fresh (see Miles et al., 2014). Also, all analysis and conclusions were provided to participants during and after the process in a prompt manner to complete member checking and create transparency. I established and maintained participant code numbers for all interviews which began with C001 for QI, D001 for the Clinicians, and E001 for the care providers or family members. I used these codes to save all email contact, each transcription, and the related materials on an external hard drive requiring a password and each will be kept in a locked secure location for a minimum of 5 years after the completion of the study.

Each of the three instruments in this study were open-ended, semistructured interview questions produced by this researcher (see Creswell, 2013; Miles et al., 2014; Patton, 2002). The QI instrument (Appendix A), the clinician questions (Appendix B),

and the caregiver or family member interviews (Appendix C) were used to gather detailed data, so I could develop a comprehensive understanding of the perspectives and behaviors of the quadriplegic participants who experienced PU prevention guidelines in acute care settings by allowing individuals with a variety of viewpoints to express themselves in their own words about the issues (see Creswell, 2013; Miles et al., 2014). Also, an open-ended, semistructured questioning process could be used to help explore beliefs, motivations, and interests within the investigation parameters (see Gill, Stewart, Treasure, & Chadwick, 2008). The inquiry during each session was designed to provide an in-depth evaluation of the topic (see Creswell, 2009; Miles et al., 2014; Patton, 2002), which would create a clear path between the research questions and the interview instruments to help establish increased credibility for the study. The QI interview instrument questions (Appendix A) explored participant perspective of PU prevention guidelines experienced in acute care settings related to mechanism protocols, the context or circumstances of execution, and the perceived outcome of related events and programs. However, the clinician interviews (Appendix B) also addressed items such as training, education level, assessment tools, recognition abilities, protocol and procedures, insights into PU guideline execution, recent improvements in facility routines, and outcomes for specific institutions. Subsequently, the clinician questions helped ascertain if the guidelines had been executed properly or administered in a manner to prevent PUs in specific acute care situations. Finally, the interviews with care providers and family members of QI (Appendix C) additionally investigated caregiver training, PU assessment knowledge, wound recognition abilities, regular routines, insights into PU guideline

execution that assist in daily prevention, specific outcomes, and emotional or anxiety issues for QI patients. Care provider and family member questions were developed to help ascertain if the guidelines had been executed properly or administered sufficiently to prevent PUs on a regular basis within a homecare regimen.

I developed a saturation grid model for each of the three interview instruments by using the concepts of mechanism, context, and outcome established by the research questions and PBC as broad markers (see Baker, 2011; Baxter & Jack, 2008; Rycroft-Malone et al., 2010), and subsequently weighed these concepts against the content gathered by the completion of the questioning process in each case. In other words, the interview questions elicited mechanism information in a comprehensive manner about PU prevention experienced in acute care settings, reflecting skin assessment tools, wound recognition by clinicians, and action taken according to observation of facility staff. Also, contexts concerning the type of facility and specific circumstances encountered during execution of prevention guidelines were investigated thoroughly during the questioning process, outlining a specific outcome for each QI participant.

Content validity for the three interview instruments was demonstrated using the model and mathematical equation created by Lawshe (1975) for each question to determine the Content Validity Ratio (CVR) which helped establish if the item was essential and that it exceeded chance agreement before presentation to participants. Establishment of the CVR was accomplished by assembling a panel of six experts to evaluate each interview question as essential, useful, or not necessary (see Ayre & Scally, 2014; Lawshe, 1975). The panel consisted of two RN wound care nurses, one RN floor

nurse, one emergency room physician, one care provider or family member of a quadriplegic individual, and one QI. Gilbert and Prion (2016) suggest three experts will be deemed acceptable, but normally the panel will be more than five and less than ten. According to Lawshe (1975), the greater the value of agreement over fifty percent of the panelists for essential items will help establish assurance of content validity, but a CVR threshold of .78 is suggested based on a one-tailed t-test with an alpha (level of significance) of .05 (Ayre & Scally, 2014; Gilbert & Prion, 2016). After evaluation of each interview question, I averaged the CVR calculations for each individual instrument, comparing the essential, useful, and not necessary determinations to arrive at the Content Validity Index (CVI) or the mean value, which according to Gilbert and Prion (2016), should be between 0.70 and 0.80 or greater for final inclusion or acceptance after panel evaluation. The end result for the calculation was 0.82 for my instruments. Furthermore, I excluded all items from the interview instruments deemed not necessary by a majority of the panel of experts.

An additional important instrument in a case study is observation by the researcher of behaviors, events, and situations that occur during the interview sessions and throughout the collection of other sources of data which adds to the depth of the investigation and the analytical process, allowing for inferences that may not be revealed by an interviewee and insights uncovered while gathering information (Creswell; 2009; Maxwell; 2013; Patton, 2002). During the interviews and data collection, I maintained a detailed journal related to the research process and observations (see Creswell, 2013; Janesick, 2011). The observations and the researcher's role are to help ensure reliability

of the data collection and create trustworthiness for the study; therefore, these observations were later triangulated with the interviews and other sources of data to support the information gathered during the interviews, elevate bias, and improve credibility, dependability, and confirmability (see Creswell, 2013; Creswell, 2009; Patton, 2002). In this study, I was (a) a complete participant as the interviewer, (b) an observer during interviews, (c) a nonparticipant reviewing PU guideline activities, and (d) unseen or unheard while observing acute care settings, clinicians, care providers, and family members (see Creswell, 2013). Bias was avoided by personal researcher reflection, reflexivity or personal observation, standardization of the interview process, and data triangulation (see Patton, 2002). Ultimately, the observation instrument added detailed description to the experiences and behaviors expressed during the interview process (see Creswell, 2009; Janesick, 2011; Patton, 2002).

Field notes are an instrument reflecting another aspect of observation. Field notes supported the evaluation and analysis of the study by providing a reliable source of reflection (Patton, 2002). One type of field notes in this study was descriptive, general, or obvious, and a second type was reflective including personal views and insightful detail of observations (see Creswell, 2013). Field notes were assembled and viewed as an onlooker and an outsider from the researcher's perspective, covertly, over a period of time and were approached with a broad focus to describe the events and behaviors of QI interviews and a review of acute care settings to provide insights into the multiple sources of data retrieved (see Creswell, 2009; Janesick, 2011; Patton, 2002).

The study employed collection of various secondary sources of data besides open-ended interviews and researcher observation. Secondary sources of data included (a) historical documents from acute care settings, (b) archival records from healthcare agencies, and (c) physical evidence provided by the participants. Physical evidence from participants such as medical records and QI personal PU photographs were to be used when approved and provided by email or regular mail after the interview session as agreed upon within the informed consent form or during interviews, but this physical evidence was not used in this study. An online search was executed seeking (a) public statistics on PU history in acute care settings within the United States, (b) information about specific institutional programs aimed at PU prevention, and (c) data showing improvements of guideline execution and outcomes related to PUs. I planned to request an approval waiver from specific institutions noted by QI participants to review PU historical data that would be used to support information from interviews, but this was not utilized in this study. Also, direct contact could have been set up by the researcher with specific acute care settings mentioned by QI participants in their sessions along with various other institutions to seek approval for phone and face to face interviews. In these instances, I would have used the clinician questionnaire instrument (Appendix B) to collect administrative information about prevention and improvement of PU, but this was not utilized in the current study. The secondary data sources or institutions included (a) the University of Washington Rehabilitation Center, (b) Harborview Medical Center Seattle, Washington, (c) VA Puget Sound Health Care Seattle, Washington, (d) Johns Hopkins Medicine Baltimore, Maryland, (e) Banner Hospital, Tuscan, Arizona, and (f)

Banner Hospital, Phoenix, Arizona. Also, information about PUs, historical data, and legal documents was collected from websites and email contact from (a) the Department of Health and Human Services, (b) Centers for Medicare and Medicaid Services, (c) Agency for Healthcare and Research Quality, (d) Centers for Disease Control and Prevention, (e) the National Pressure Ulcer Advisory Panel, (f) Institutes of Medicine, (g) the US Food and Drug Administration, (h) the World Health Organization, and (i) the US Department of Veterans Affairs.

The data collected in this study was specifically designed by the researcher to sufficiently evaluate PU prevention guidelines executed in acute care settings by comparing various sources of information to QI perspectives of experiences related to their personal situations and events. The analysis of QI perspectives allowed a detailed examination of mechanisms or protocol and programs surrounding PU prevention guideline execution in acute care settings, which was an instrument formulated from the research questions. Furthermore, PBC was addressed utilizing the data to review how context and circumstances influence execution of PU prevention guideline mechanisms in these acute care settings leading to specific outcomes. In this way, the data analysis directly addressed and focused on the research questions with an in-depth exploration. All data collected was coded for privacy and transparency. All data was saved on an external hard drive requiring a password and maintained in a secure location.

Procedures for Recruitment, Participation, and Data Collection

First, I obtained approval from the IRB of Walden University receiving permission to begin recruitment of participants and to collect data from the individuals

involved in this study. The IRB approval number is 10-09-17-0296679. As the researcher, I was the person who managed the interview method (Appendix A, Appendix B, Appendix C) of primary data collection in this study including retrieval of all information from secondary and various sources. I contacted administrators at spinal cord injury associations to gain permission and assistance reaching out to QI who may be interested in joining this research process. A copy of the QI Recruitment Letter was included in the administrator contact. In this study, I recruited QI participants from spinal cord injury associations and rehabilitation centers and contacted each by email to receive formal informed consent, and subsequently interviews were conducted with the primary instrument (Appendix A) by the researcher over the phone in one session at an approved time. Interview sessions took approximately one hour to complete. All interview sessions were digitally recorded and immediately transcribed verbatim within three days and returned to the participants within one week for approval and member checking, then stored securely on an external hard drive with password access and placed in a locked room by the researcher to be kept for a minimum of five years. The researcher purposefully avoided influencing the participants while the interviews were in progress (see Creswell, 2013; Miles et al., 2014; Patton, 2002). There were three interview instruments managed by the researcher which were used to provide an avenue for exploration of the perspectives and experiences of QI, investigation of clinician execution of programs, and review of care provider and family member insights. Clinician and QI care providers and family members were recruited for the two secondary instruments, and the same procedure of initial contact, informed consent, and interview was employed.

Clinician locality varied but the care providers and family members lived in locals near the QI participants. Clinicians were recruited by word of mouth in the Washington State area where I live and in acute care settings mentioned by QI. Subsequently, this information was used to evaluate PU prevention guidelines executed in acute care settings by comparing all participant insights to multiple sources of data collected from an Internet search of public information as well as personal contact with institutions and agencies. 35 cases from the QI population were the main target participant pool for this study along with 35 clinician samples and 35 care provider and family member interviews. However, the final participant pool was ten QI, three clinicians, and one care provider/family member. This data helped establish proper PU prevention guidelines, QI personal daily routines, and acute care program efficiency (see Ghavam et al., 2014). Also, photos, personal records, or medical history that QI agreed to relinquish in the informed consent, could have been provided after the interview sessions to support participant verbal perspectives but were not utilized in this study.

Various sources of data from acute care settings expressing execution of PU prevention guidelines were extracted by the researcher from public institutions and agency websites throughout the collection process; because, one focus of the study analysis was to see if protocol had improved outcomes through proper use of mechanisms or programs used in varying contexts or circumstances related to the pressure ulcer issue. I planned to make a formal request to administrators of specific institutions mentioned by QI to facilitate permission for access to data about their PU programs, but this process was not used in this study. The combination of QI interviews, clinician evaluation, and

care provider and family member insights along with researcher journals, and various sources of data helped answer the research questions and support the framework of PBC (see Rycroft-Malone et al., 2010). Information from the QI participants, healthcare professionals, and various sources of data gave insight into the research questions concerning context related to episodes of care and the influence of circumstances on the mechanism of PU prevention guidelines and eventual outcomes (see Rycroft-Malone et al., 2010). The researcher journal supported the reliability and validity of the study; while providing a format for detailed description of observations (see Janesick, 2011; Miles et al., 2014).

The recruitment process and interviews were designed to involve 35 individuals from each category of QI participants, clinicians, and care providers or family members, but in this study fewer cases were recruited, so the researcher continued the data collection process by seeking in-depth information from each instrument. The interview questions were presented to the participants by the researcher in one session that lasted approximately 1 hour. The participants were informed of the transcription process, availability of copies, anonymity, and transparency of all elements of the study before the beginning of interviews and the exit process for debriefing. Each participant was asked permission to answer follow up questions at a future time, if necessary, and they were allowed to give feedback about the process upon completion of the interviews.

Data Analysis Plan

Data analysis began by pre-coding themes from each of the 3 interview instruments based on the research questions involving mechanism, context, and outcome

related to PU prevention guidelines executed in acute care settings. I extracted phrases from all interview instrument data which was significant to these issues, developed a set of codes for review, and identified ideas according to meaning in clusters for the themes of mechanism, context, and outcome from participant interview answers, clinician inquiries, and care provider and family questionnaires (see Miles et al., 2014; Patton, 2002). Therefore, the concepts of mechanism, context, and outcome became broad themes or pre-codes extracted from the research questions and PBC, which were associated with the answers from all three interview instruments and later connected to other data collected. Evaluation of these pre-code concepts that might occur in acute care settings surrounding PU prevention guideline execution were subsequently compared to data retrieved from online research of public historical documents and information gathered by direct contact with spinal cord associations, rehabilitation centers, and organizations. Later, all pre-codes were combined in one format, which helped lead to inductive thematic development of ideas (see Miles et al., 2014; Patton, 2002). I evaluated the research questions in this process by reflecting on mechanisms of PU prevention and comparing aspects of thematic data to the context that exists in acute care settings observed through QI perspective, clinician insight, and care provider or family member views as well as various sources of data; then, codes and themes, which were cross-referenced with the outcomes from each case. In this way, pre-codes established from (a) the perspective of QI assembled from interviews, (b) clinician viewpoints, (c) care provider and family member knowledge, and (d) researcher observations were used to develop tree codes which were superimposed over preliminary coding extracted from

all other data (see Miles et al., 2014) to help explain the outcomes observed in each case within the study. Subsequently, the themes were organized and coded into a description of the phenomena of PU and compared to the perspectives of QI and the various sources of data collected (see Creswell, 2013; Miles et al., 2014; Patton, 2002). This data analysis methodology recurred for each case. An additional set of codes were established to help realize any new themes that may be implicated to induce more explicit avenues of analysis in a second cycle of coding (see Miles et al., 2014).

Coding incorporated the reduction of the raw material into themes and sub-themes that was rationalized from the pre-codes or a start list which was deductive in nature, but later secondary categories emerged, implementing an inductive nature to the process (see Miles et al., 2014). The process allowed me to examine the codes as items that fit together in convergent and divergent units with potential to develop a creative approach of viewing the emergent themes as the analysis proceeded (Patton, 2002). The reduction or fracturing of interviews with QI, clinician, care providers, family members, and raw data from all other sources of data (see Miles et al., 2014) was a primary strategy to begin the analysis, but an additional phase consists of connecting themes and ideas back together in an axial process which placed categories and sub-categories in a new alignment (see Walker & Myric, 2006). I looked for coherence, consistency, understanding, supportiveness, and usefulness from interviews and related these ideas to all other data (see Patton, 2002). The analysis summarized the information from within the QI perspective and connected ideas outwardly among the categories of other data related to acute care settings to develop relationships and perhaps larger categories of

relative importance to the issue of PU prevention and outcomes from guideline execution (see Powell & Renner, 2003). Therefore, the fracturing process proceeded to an inductive approach based on emergent aspects of the data, connecting these themes in a manner that helped lead to conclusions about PU prevention in acute care settings (see Powell & Renner, 2003).

All three interview instruments were transcribed verbatim immediately after phone sessions to maintain accuracy of the QI interviews, along with the clinician insights, and participant care provider or family member views and uploaded into Computer Assisted Qualitative Data Analysis Software (CAQDAS). All historical documents, statistical charts, secondary information, and audio recordings were scanned or prepared for input into CAQDAS so easy review of data for analysis could be accomplished, and themes could be viewed, connected, and cross-referenced (see Johnson, Dunlap, & Benoit, 2010). NVio 12 CAQDAS was used in this study to manage the data for analysis. NVivo 12 allowed the researcher to input data in the home section and the sources section before it was coded and organized into nodes; then the queries guided the data to investigation of different themes (NVivo, 2016). The interview transcriptions were read several times to access a good overview of the content and uploaded into NVivo 12 with code names to maintain confidentiality. Also, all participants were given code names, and key phrases were converted into free thematic ideas and developed into tree concepts (see Miles et al., 2014). Some child nodes were created (see Miles et al., 2014), and finally, content was reviewed for recurrent themes and eventually reviewed with a checklist to ensure quality of the analysis, content validity

and insure transparency during the process of documentation (see NVivo, 2016). I enlisted the services of an independent researcher who established their own pre-codes, codes, and themes which were compared to the content of this researcher to improve the level of agreement observed during the study analysis, conclusions, and results. During the process, I stepped away from each phase of the documentation and analysis process and returned within a week to verify the data content, which helped identify the percentage of agreement for the study thematic structure and inter-rater reliability (see Creswell, 2013; Miles et al., 2014; Patton, 2002).

In a case study, data that exposes a variant perspective or a negative impression of the emerging theme is referred to as discrepant and is characterized by contradiction of initial hunches (see Creswell, 2013; Patton, 2002). I searched for deviant or discrepant cases to broaden the conclusions or results in the study by redefining, expanding, and confirming patterns and themes for analysis (see Miles et al., 2014); however, there were no discrepant cases noted during the analysis process.

Issues of Trustworthiness

Credibility

Credibility was established by the use of member checking and triangulation; along with verification of participant recall which was compared to artifacts and documents under review (see Miles et al., 2014). The study relied on saturation of sample cases along with various sources of data to improve credibility by focusing on accuracy of themes during the process (see Mason, 2010; Patton, 2002). Member checking directly involved each participant to assure transparency and accuracy, so the transcripts of all

audio recordings were verified by the interviewees immediately after the sessions, which added to the credibility and reliability of the data collection (see Miles et al., 2014). I also shared my saturation grid with the participants by explaining the path from face value to content to help make sure my inferences and analyses were accurate. Triangulation improved credibility and validity by collecting multiple sources of data from participant interviews, clinician insight, care provider and family member knowledge which were compared with the observations of the researcher, historical information, and contact with agencies directly involved in PU prevention strategies (see Maxwell, 2013). Internal credibility was assured through complimentary methods such as triangulation, data saturation, and proper identification of themes expressed in a meaningful, true, clear, and concise manner (see Dworkin, 2012; Miles et al., 2014). Reflexivity was addressed by maintaining detailed documentation throughout the data collection and analysis process. Bracketing was used throughout the data collection process where the memos by the researcher, the interviews, and other sources of data was set aside and revisited at a later time to create awareness of preconceptions and biases (see Tufford & Newman, 2010). Discussion with an independent researcher was utilized to establish agreement on study protocols and agreement related to codes and findings. All discrepant data which ran counter to themes was well documented to increase the credibility of the study. No discrepant data was uncovered in this study though. Finally, peer review by three fellow researchers was utilized during the data collection process to obtain further objectivity. Peer review was also used during the debriefing process to help facilitate exit from the process.

Transferability

Transferability is not a general aspect of qualitative research, but recognition of recurring themes among participants might allow for some generalization (see Creswell, 2013; Miles et al., 2014; Patton, 2002). Themes were developed in this study through the use of detailed, thick description of the perspectives of QI which was compared to various sources of data. In the current study, the fact that QI are among the most susceptible for PUs may lead to transferability for other severely disabled or hospitalized individuals; because, immobility evaluation from this research is a common theme which may lead to secondarily-acquired wound development. External validity was presented in the form of transferability to PU prevention practices based on the proposed theory, application to acute care guidelines, and improved execution of protocol, processes, and programs (see Miles et al., 2014).

Dependability

Detailed description and documentation of the research assures dependability and establishes the practices for the entire process, including repeatability (Miles et al., 2014). Data in this study was reviewed and audited periodically during the collection and analysis process (see Creswell, 2013; Miles et al., 2014; Patton, 2002). I utilized member checking by having the participants review transcripts of all interviews immediately after the sessions and also in a secondary interview to review researcher analysis (see Miles et al., 2014). I remained focused and personally aware of all researcher actions to support reflexivity throughout the process. An independent qualitative researcher reviewed all content in this study to improve the level of agreement and accentuate the dependability.

I also stepped away from documentation and analysis occasionally and returned at a later time to re-verify the content in order to increase the percentage of agreement in the form of inter-rater reliability (see Ayre & Scally, 2014; Mason, 2010).

Confirmability

Approval from the participants and accuracy of the transcripts was foundational to transparency, reliability, and confirmability (Miles et al., 2014). Objectivity was employed throughout this research to free the study from researcher bias (see Miles et al., 2014). This process was aided in this study by utilizing a personal journal throughout to support confirmability through objectivity (see Janesick, 2011). The journal detailed each aspect of the process, including how the data was collected. I sent brief summaries and full transcriptions of the information from each interview to the participants requesting approval immediately after each session. Therefore, the participants were able to review the data to make sure their perspective was reflected. Reflexivity, and researcher awareness was addressed in the study by assuring all data in this investigation could be traceable and confirmable within the transcriptions of the audio files from the interviews and data documentation. Additionally, I clarified information with participants about my personal work supporting QI over a 25 year period, which involved an understanding of the quadriplegic lifestyle and daily routine, including PU prevention and development. Understanding the SCI and QI culture was helpful in building trust which helped to improve accuracy in describing the participant experiences. Therefore, I was vigilant about prejudgment and kept a structure of standardization during the interview process to help assure objectivity in an effort to overcome biases which might occur.

Intra- and Intercoding

A diligent and continuous use of objectivity and review of the data collection and analysis process was used to maintain consistent verifiable documentation of all codes of information. The researcher relied on detail to help lead to all conclusions and results from the initial pre-codes to the discovery of complicated themes. Internal reliability occurred by setting aside data for a short period of time and later reviewing it to verify if interpretations were correct, which led to corrections and more accuracy.

Ethical Procedures

The QI and all secondary participants recruited for this study were informed clearly and respectfully concerning the research process to avoid deception about any purposes of this study (see Creswell, 2013). Ethical concerns were a priority to ensure IRB approval; so, the names and locations of all involved have been guarded to provide confidentiality (see Creswell, 2013). The IRB provided an approval number after the completion of all necessary documents. The IRB approval number is 10-09-17-0296679. Also, I obtained approval or a written waiver from institutions mentioned by the participants, when necessary, so I could facilitate a detailed review of historical data related to PU prevention guideline execution, improvements, and outcomes to further support and evaluate the QI experiences in specific acute care settings. The participants for the present research were adult QI without traumatic brain injury, who were capable of making decisions about involvement in the study, and who along with clinicians, care providers, and family members were informed that complete transparency could be assured in every aspect of the research. Also, the participants reviewed and signed

informed consent forms that described details of the study, purpose of the research, inclusion criteria, interview protocol, statement of confidentiality, and a description of the researcher, including full name, address, contact information, and proof of identity (see Janesick, 2011; Patton, 2002). Additionally, during the development of this purposive sample strategy, I reserved the right to recruit former QI clients from personal work environments, who adhere to the participant specifications, and who provided pertinent valuable information regarding the problem and purpose of this study. Each participant in the study was afforded the right to withdraw at any time during the process, and they were assured the interviews and data collection process was conducted in a strictly professional manner. As the researcher, I maintained complete anonymity in all aspects of the research process, and I developed a confidential and private method of data storage for journals, researcher notes, and coded information which was protected by a password and stored on an external hard drive in a locked secure environment. Interviews were conducted in a relaxed professional environment. Each participant was informed of a small $25 gift card compensation for completion of the process. Finally, the evaluations and the conclusions were shared with the participants to accomplish full disclosure (see Creswell, 2013).

Summary

This study explored the perspective of QI about PU development related to prevention guidelines experienced in acute care settings. A qualitative case study was implemented as the research approach. The data was obtained from interviews with the participants and various other sources of data including medical records, institutional

history, and professional insights. The participants were selected from QI who had experience with PU prevention guidelines and acute care settings. Every means available was used to maintain trustworthiness, ethical procedures, and transparency during the research process. The IRB approved the study based on fulfillment of requirements. The interviews were collected as digital audio recordings and transcribed verbatim; before they are analyzed. Potential biases and limitations were documented in detail. In Chapter 4, the themes and observations gathered from participant interview results and various sources of data will be reviewed, evaluated, and analyzed in detail.

Chapter 4: Results

Introduction

The purpose of this qualitative study is to examine the effectiveness of acute care guidelines for the prevention of PUs in QI by drawing insight from various sources of data. The participant selection for this qualitative study includes ten QI, three clinicians, and one professional care provider of a QI who is a Certified Nursing Assistant (CNA). I developed research questions to help understand the phenomena of PUs and prevention of hospital-acquired wounds. The research questions utilized for this study are to what extent does the mechanism of PU prevention in acute care setting prevent the outcome of wound development, and how does the context associated with an episode of care impact the mechanism of PU prevention initiated in the acute care setting?

In this chapter, the research design is explained. The case study approach, rationale, and tradition was outlined with its relationship to the research questions, purpose, and problem surrounding the current study. My role as researcher is then highlighted by depicting all personal relationships, potential biases, and ethical issues involved with the study. After I describe the setting including location and participant privacy, the demographics section provides details on the participants including the final sample size, and how the participants were qualified to answer the research questions. The data collection section states the number of participants, details on presentation of the instruments, recording technique, variations in planning, and unusual circumstances encountered. I then report on the data analysis process by describing the coding units and themes that emerged from the investigation. Issues of trustworthiness are outlined by

explaining credibility, transferability, dependability, and confirmability related to external validity, internal validity, audit trails, and relationships between the research and the researcher. The results are then presented utilizing the data collected to support the research questions, and all discrepant cases will be identified. Finally, a summary of the results will be presented.

Setting

This qualitative case study was conducted entirely over the phone in the form of participant interviews which were audio recorded. The participants were speaking from the comfort of their own home; therefore, the setting allowed complete privacy and confidentiality. There was no indication that any of the interview experiences may have altered the results or interpretation of the study.

Demographics

My study population was QI who had been admitted to an acute care facility and experienced execution of PU prevention guidelines. This population selection is important because QI are among the most vulnerable for PU development; therefore, each participant is qualified to help answer the research questions through personal experience. The level of spinal cord injury was not considered in this study, because all participants were QI and highly vulnerable to PUs. The participants included 10 QI, two clinicians, and one professional care provider who is a CNA. It should be noted that of the 10 quadriplegic participants three were female (n=3 or 30%) and seven were male (n=7 or 70%) with ages ranging from 35 to 58 years of age (M=49.40; SD=7.71). I did not inquire the ages of the clinicians or care providers. I did not inquire the ethnicity of

the QI participants, clinicians. or care providers, because it has no bearing on this study. I did not inquire the level of education for QI participants.

Data Collection

The data collection in this study was completed by interviews with ten QI, three clinicians, and one care provider or family member of a QI participant and later supported by secondary data form various sources. I developed three data collection interview instruments which were approved by the Walden University IRB. One instrument was specifically for the QI, the second was for clinicians with knowledge of PU prevention guidelines, and the third was for care providers or family members of QI. Each participant interview was presented one time over the phone and audio recorded. The length of the interviews was from 45 minutes to 1 hour and a half (M=55.77 minutes; SD=19.51 minutes). Two interview sessions lasted longer due to important information that was given.

The variations in the data collection process involved changes in the navigation of preplanned process. After receiving approval from the IRB of Walden University (approval number 10-09-17-0296679), I began the quadriplegic participant recruitment process. First, I wrote a quadriplegic participant recruitment letter. I made a phone call to the VA Hospital Spinal Cord Unit in Seattle, Washington. I spoke to an individual who said there were channels to go through in order to contact patients or clients of the VA. He did not explain these channels or procedures. Because I had interacted with the office of the social worker at the VA in Seattle for a quadriplegic client in the past, I thought I might speak to them personally and get the information necessary to move forward. The

person I talked to said they were the head of the social worker's office and were not my previous contact, which left me without a personal contact. However, the social worker agreed to accept an email of my recruitment letter. He said he happened to be going to an administration meeting the next day, and he would present my letter and proposal of recruitment to the group. He said he would get back to me and let me know what was decided. He also gave a me a local phone number for the Paralyzed Veterans of America which he said was a non-profit, and it may be easier to gain access to their clients. A few days went by and I heard nothing from the office of the spinal cord injury social worker at the Seattle VA.

In the meantime, I called the Paralyzed Veterans of America and the coordinator was very open to my request and said they would place my recruitment request in the organization's monthly newsletter. I was told the recruitment letter could appear the next month in the publication, and it would reach several thousand paralyzed individuals with SCI. After the publication, I got zero response from the published recruitment letter.

I began to navigate the bureaucracy at the VA which I found to be difficult. So, I turned my attention to the Paralyzed Veterans of America. After two months had passed, no one responded from the Paralyzed Veterans of America. At this point, I went online to the University of Washington spinal cord rehabilitation website. I accessed the Northwest Regional Spinal Cord Injury System of University of Washington Medicine (UW Medicine). Within the website, I located a list of spinal cord injury associations or networks which are used by QI to gain information and support. One of these resources was a group of sites written and maintained by SCI individuals. I chose one site called the

Quad-List which is an SCI group interaction. I contacted the coordinator of the Quad-List and presented my recruitment letter. I asked if I could join the Quad-List, and I asked if he would release my recruitment letter from his personal email to give some credibility to the request. I joined the Quad-List, and the coordinator emailed my recruitment letter from his email. It wasn't long before I began to get responses from QI who were interested in joining my study and tell their personal stories and experiences concerning execution of the PU prevention guidelines while in an acute care facility. I became encouraged by the responses and began to email each potential QI participant. I thanked them for their interest, and I attached the Informed Consent Form. In the email, I included instructions on how to fill out the form.

Ten QI came forward in the initial response. Five QI agreed to join the study. One QI declined after reading the Informed Consent Form. Three QI did not respond with a signed Informed Consent Form. Two QI returned the Informed Consent Form but did not respond to future contact. At this point, I began to schedule interview dates and times with the QI who agreed to participate. My goal was to recruit many more QI for participation. After I presented the interviews of the first five QI, I waited to see if more participants would come forward. A significant amount of time had passed at this point including my initial contact with spinal groups, signing up with the Quad-List, presenting the initial interviews, the transcription of the first participant statements, and member checking. I decided to contact the Quad-List coordinator and ask for a second distribution of my recruitment letter. He agreed and soon I was contacted by nine more potential QI participants. Five more QI agreed to join the study, and I scheduled and presented

interviews. The four remaining QI did not respond to the request for the Informed Consent Form. Near the end of the recruitment period, one QI participant came forward saying he was part of an SCI group with 2000 members. He offered to tell the group about my study. I told him I would be very interested in speaking with QI who developed PUs in an acute care facility. I waited for response by new QI participants, but no one came forward from that group. This entire process took approximately 1 year to complete.

I spoke to people in the community and established the clinician participants by word of mouth. There were three clinicians interviewed during the data collection process. While interviewing the QI participants it became evident that their care providers or family members were going to corroborate the information given by the quadriplegic individuals, so after interviewing one care provider who was a family member, I decided that there was no need for more interviews in this group.

Variations in the recruitment process proved to be difficult as an individual student researcher. The element of time proved to extend far beyond what was anticipated. In my original study, I proposed to interview 35 QI. Subsequently I planned to interview 35 clinicians with knowledge of the PU prevention guidelines. Finally, I had planned to gain information from 35 care providers or family members of QI. I believe with more time and resources I could have attained the number of participants that were speculated in the design of this study.

It should be noted that the only unusual circumstance that occurred during the data collection process involved one QI participant who only wanted to answer the

interview questions in writing to be returned by email because they were not comfortable giving out their phone number. I agreed to this request. All other interviews and interactions with participants were easy and comfortable. The participants were very eager and willing to give their personal experiences with the PU prevention guidelines related to acute care facilities.

Data Analysis

The data analysis followed a coding approach described in Chapter 3. The computer assisted data analysis tool NVivo 12 for Windows was used following precoding. First, I transcribed all case interviews from audio recordings made during the presentation. I also incorporated my field notes taken during the interview sessions. According to Mero-Jaffe (2011), all interviews should be transcribed verbatim by the researcher and returned immediately by email to the participants for review to verify dates, locations, surgical procedures, and correct any discrepancies in facts before proceeding with data analysis. I shared the interview transcriptions with the participants for politeness, transparency, and validation of information the researcher heard on the audio recording (see Mero-Jaffe, 2011; Page, Samson, & Crockett, 2000; Polit & Beck, 2007). Three participants made changes to the transcription about dates and personal history. Later, I imported all items into NVivo 12. After review and finalization of the transcripts, a $25 gift card was provided to each participant as reimbursement for their time assisting in the study.

Qualitative research explores patterns, themes, and content analysis (Creswell, 2013). The first phase of the analysis was to pre-code broad themes based on the research

questions related to the themes of mechanism, context or circumstance, and outcome. Secondly, these themes were triangulated in a cross-case synthesis to seek details about recurring themes within the participant data from all cases. In this way, I have sought correlation in the data alignment which shows common themes among the participant experiences. There are three types of cases in this study which include QI, clinicians, and care providers or family members of quadriplegic individuals. Each group has gone through the precoding process, and the different groups have been cross synthesized for common themes and patterns.

After uploading the interviews and field notes into NVivo 12 under Sources, I was able to create nodes or codes that expanded on the first phase or pre-coding mentioned above. I was able to see the connection between the pre-codes and the Nodes from NVivo. As the analysis unfolded it became evident that the original pre-codes of mechanism, context or circumstance, and outcome are extremely valid in this study, successfully highlighting the research questions. In this study, I have uncovered three emergent themes which directly relate to the research questions and five emergent subthemes derived from the participant information. Emergent theme one establishes how the mechanism of the PU prevention guidelines is the most efficient means of preventing PUs in an acute care setting or in the community. Emergent theme two reflects how the context or circumstance of PU prevention guideline execution directly affects the success of PU prevention. Emergent theme three shows how the outcome derived from mechanism utilization is directly related to the context or circumstances surrounding the PU guideline execution, and in this study, it can depict the potential success of PU

prevention compared to possible failure of the process. Emergent subtheme one reflects how staffing issues affect the execution of the PU prevention guidelines. Emergent subtheme two shows how continued education of staff is crucial to the success of PU prevention guideline execution. Emergent subtheme three accents the importance of education of new staff for the success of PU prevention guideline execution. Emergent subtheme four establishes the importance of patient awareness during an acute care visit in order to help assure the success of the PU prevention guidelines. Emergent subtheme five reflects the need for patients to have an advocate family member or care provider to support personal awareness and help insure the success of the PU prevention guidelines. Furthermore, the information gained from all participants is aligned with agreement on the successful execution of the PU prevention guidelines and their potential to deter PU development.

Each case was given a code name to protect the identity of the participants. QI have received C000 code names. Clinicians have received D000 code names, and care providers or family members of QI have received code names E000. These code names are based on the titles of the appendixes for interview questions which appear in this document. Also, there are no specific discrepant cases, but the theme of context or circumstance has proven to affect the mechanism and outcome in several cases.

After interviewing four QI, one clinician, and one professional care provider (CNA) or family member, it became clear that participants were offering similar information on the subject of the PU prevention guidelines, which led me to assume a point of saturation for the interview data had been achieved. The saturation point was

determined by using a matrix format during the interview process to categorize the broad pre-coded themes of mechanism, context or circumstance, and outcome. I continued the scheduled interviews after the saturation point to see if new information may come forth.

In a final phase of analysis, I utilized member checking to establish the credibility of the study and the data analysis. Member checking is a process which helps to establish trustworthiness in qualitative research by reviewing of the analyzed data with the participants (Brit, Scott, Cavers, Campbell, & Walter, 2016). I contacted the participants by email to set up second member check interview (see Brit et al., 2016). After completing analysis of the interview data as described above, I presented each participant with the synthesized analyzed data (see Brit et al., 2016). I explained the emergent themes and their connection to the research questions. Each participant was given an opportunity to recognize their own experiences within the analyzed themes (see Brit et al., 2016) and has offered their own critical observation of the analyzed data (see Creswell, 2013). All participants responded to the member check interview of synthesized analytical data, and each has agreed that the emergent themes reflect their interpretation and experience with the execution of the PU prevention guidelines in acute care settings. Finally, I have stored the interview recordings and transcriptions on an external hard drive and placed it in a secure location in a locked drawer in my office.

Evidence of Trustworthiness

Credibility

Credibility is established by the accuracy of the information collected (Creswell, 2013; Miles et al., 2014; Patton, 2002). I followed the strategies for credibility outlined in

Chapter 3. Credibility has been set forth by precise data collection joined with a commitment to the process of the study and a rapport with the participants (see Creswell, 2013; Miles et al., 2014; Patton, 2002). Credibility was achieved by proper identification of themes and patterns (see Dworkin, 2012). The study participants were properly selected based on the research questions (see Miles et al., 2014), and internal validity has been supported because data collection occurred until saturation was fulfilled (see Creswell, 2013; Dworkin, 2012; Miles et al., 2014). In addition, member checking of interviews involved each participant in the transparency and accuracy of the data collected (see Miles et al., 2014). Triangulation of data from each participant category with PU statistics, historical data, and researcher observations helped improve credibility and supported saturation (see Maxwell, 2013; Miles et al., 2014). Reflexivity was established by detailed documentation of the data collection and analysis process (see Creswell, 2013; Miles et al., 2014; Patton, 2002) so the memos, interviews and data were set aside occasionally to in the form of bracketing to prevent bias and insure awareness of preconceptions (Tufford & Newman, 2010). Also, I have discussed this study with one independent researcher to establish agreement on the study protocols. I was only able to find one peer researcher to review this study in order to help with objectivity. I have found no discrepant data during the research process.

Transferability

Accurate findings and detailed descriptions are the foundation for transferability (Miles et al., 2014). I have created a thick and rich description of the study especially detail of the documentation process, including the setting, the participants, and the

results. The QI participants are specially qualified to speak about the PU prevention guidelines related to experiences in acute care settings. Methodical triangulation leading to data saturation has promoted transferability to other groups who are immobile and vulnerable to PUs by focusing on the purposeful sampling of QI who are among the most susceptible for PUs (see Creswell, 2013; Miles et al., 2014; Patton, 2002). Transferability and external validity are related to the PU prevention practices, and the application of proposed theory and execution of protocol in this study meets that criteria (see Miles et al., 2014).

Dependability

To assure dependability and repeatability, I have used detailed description and documentation throughout the research process (see Miles et al., 2014). I have used member checking to verify the transcriptions and data analysis (see Miles et al., 2014). I have remained aware of my actions as the researcher throughout the process to support the reflexivity of the study. I have reviewed the study with one independent researcher to establish agreement and improve dependability. The independent researcher and 100% of the QI participants, clinicians, and care providers or family members agreed on the means to successful execution of the PU prevention guidelines in acute care settings. Through member checking, all participants have agreed on the purpose, reliability, and success of the PU prevention guidelines. Additionally, I have stepped away from the documentation and analysis for 3 to 4 days once a month to gain new perspectives and to verify content and establish inter-rater reliability (see Ayre & Scally, 2014; Mason, 2010).

Confirmability

To establish confirmability, I have remained impartial and unbiased in the presentation of the data provided by the participants, and none of the interpretations have been influenced by this researcher (see Creswell, 2013; Miles et al., 2014; Patton, 2002). I have retained reflexivity throughout the process by being constantly aware of my interactions with the study (see Miles et al., 2014). All assumptions and explanations were data driven to support confirmability (see Creswell, 2013; Miles et al., 2014; Patton, 2002). During the study, I have transparently described my role as the researcher, my qualifications, my occupation, and my relationship if any to the participants (see Patton, 2002). Transparency, approval of the participants, and accurate transcriptions have created the foundation for confirmability (see Miles et al., 2014).

Results

To answer the research questions and explain the underlying themes, I have conducted fourteen interviews with QI, clinicians, and care providers or family members of QI. The purpose of this qualitative study is to examine the effectiveness of acute care guidelines for the prevention of PUs in QI by drawing insight from various sources of data. QI and other SCI were underrepresented in the formulation of prevention strategies (see Marin et al., 2013), and information is limited about patient views on PU development during episodes of care (see Coleman et al, 2013); therefore, these interviews relinquished important insights into the current execution of PU prevention guidelines and procedures in acute care settings which are basic to the health of this vulnerable QI population.

The results of the study show that the PU prevention guidelines are efficient and are shown to work by relieving pressure from the bony prominences of immobile individuals (see AHRQ, 2013; CDC, 2015; NPUAP, 2009). These guidelines for prevention have a direct effect on the development of PUs (see AHRQ, 2013; CDC, 2015; NPUAP, 2009). Each case of PUs is specific to individual elements such as body moisture, friction in movement, diet, and immobility (AHRQ, 2013; Bergstrom et al., 1988; CDC, 2015; NPUAP, 2009). PU prevention is also reliant on specialized pressure relief equipment such as air flow mattresses and cushions (AHRQ, 2013; CDC, 2015; NPUAP, 2009). However, relief of pressure on bony prominences is mainly dependent on proper execution of the PU prevention techniques, and this study shows that to employ these established guidelines may be the number one line of defense to deter development of hospital-acquired PUs (see AHRQ, 2013; CDC, 2015; NPUAP, 2009).

The data gathered from the participants in this study is useful information describing a direct relationship to the research questions provided in the introduction to this chapter. Below I will relay specific data from the interview sessions and provide relationships to the research questions. Several of the interviews have been particularly informative. I am noting here that I experienced no discrepant cases in this study. The following are some aspects of important interviews and relationships to the research questions.

Case C011

Case C011 is a male quadriplegic age 55 who has a C4 vertebrae injury level. This QI has very limited mobility, and he requires assistance of a ventilator at all times.

This QI has battled severe health problems over the last decade. Bladder infections and PUs have placed him in the hospital multiple times for extended periods. He has had at least one flap surgery for a pressure wound which involves skin grafts and a lengthy rehabilitation. During the course of personal routines, he has acquired multiple Stage III and Stage IV pressure wounds which have required home visits by an RN wound specialist and daily scrutiny by his care providers.

C011 has outlined how each quadriplegic individual has different skin conditions (see AHRQ, 2013; CDC, 2015; NPUAP, 2009). Lifestyle factors such as immobility or personal skin status compounded with other elements like epidemiological, physiological, and biomechanical conditions can create susceptibility and allow pressure to produce PUs (Coleman et al., 2014). C011 and other interviewees have made it evident how under the best conditions a QI can develop PUs. Interviewees in this study have referred to the sudden occurrence of PUs even though they are doing everything in their power to deter pressure with the best care and high-quality preventive equipment. C011 and all other QI in this study report being very reliant on execution of the PU prevention guidelines by staff in an acute care setting (see AHRQ, 2013; CDC, 2015; NPUAP, 2009).

The mechanism of research question one (RQ1) is equivalent to the PU prevention guidelines which creates an outcome of RQ1 based on the context or circumstances of research question two (RQ2) such as actions or decisions in an acute care facility. The QI in Case C011 is a veteran and has access to a well-respected spinal cord injury unit at a VA Hospital. On a recent admission for severe bladder infection, the QI was placed in the ICU instead of the spinal unit. Upon his return home, he had a Stage

III pressure wound that developed while in the acute care setting. He was unaware of his surroundings in the beginning of his visit, and although he had assistance from a personal care provider a PU developed. He wonders why he was not repositioned according to the PU prevention guidelines or mechanism of RQ1 and or given a proper air flow mattress to relieve the stress in the ICU related to the context or circumstance from RQ2. The QI states that this wound caused extended discomfort and necessary treatment for months or years. He is expressing the concept of mechanism (RQ1) or lack of execution of the PU prevention guidelines leading to the outcome (RQ1) which became the development of a hospital-acquired wound based on the context or circumstances exhibited in the ICU (RQ2).

In this case, the QI reports "I was left on a gurney in the emergency room for extended periods of time during the above occasion and previous admissions." Also, "the ICU did not adhere to the PU prevention guidelines and only used the tilting of the bed to change positions." Therefore, the mechanism (RQ1) was not provided properly and the context or circumstances (RQ2) in the ICU created an atmosphere for potential PU development (RQ1) or outcome. The QI stated he was not offered a good air flow mattress considering his extreme vulnerability to PUs which is further alignment with context and circumstance (RQ2). He does not know exactly when his wound began to develop, but he is adamant that a Stage I wound can begin in a short period of time and could go unnoticed in the emergency room or during early care in the ICU (RQ1 and RQ2). Once the wound opened, treatment was instituted as a second stage of the

mechanism (RQ1), but it has taken two years to treat and heal this PU which is an example of a negative outcome (RQ1).

Case E001

Case E001 is the wife and long-time care provider of Case C011 described above. She has confirmed the information given in Case C011. She confirmed that the QI in Case C011 was left on a gurney on his back in the emergency room for extended periods of time on several occasions highlighting context or circumstance of RQ2. She believes the actions had an impact on compromised skin and previous PU scars establishing the potential for the development of new wounds or outcome from RQ1. It should be documented that care provider E001 lives with the QI and has known him for several years. She said that even though she was able to help a little when she visited the hospital that the staff preferred family and care providers stay out of the patient routines (RQ2). E001 stated, “The staff didn’t want to hear what I had to say, so I did not go to the hospital often.” The previous statement accents context or circumstance (RQ2) and substantiates creation of a facility atmosphere supporting non-cooperation between the staff and care provider or family member which separates the acute care personnel from useful important personal information about the QI, consequently placing the patient at risk for PU development or outcome (RQ1). E001 continued by referring to QI care, “The nurses have no idea what to do.” She added, “The nurses don’t want family telling them anything. Also, they are rude and full of resentment.” As a care provider and family member, “I got resistance from hospitals and nursing homes.” Once again, this is an example of context (RQ2) in which optimal PU prevention or mechanism (RQ1) may be

hindered under poor circumstances. She said, “The nurses and CNAs were not skilled in QI care.” In the interview E001 stated, “The nurses left things in the bed such as tubing caps, which can be a major problem for QI causing pressure and the development of wounds.” According to research question one, the mechanism failures described above will lead to an outcome (RQ1), but to create the best outcome (RQ1) good care technique or mechanism (RQ1) should be employed. E001 went on to say that the VA spinal unit care was good, but they were overworked (RQ2). She was not sure, but they probably had a “turn team” for repositioning in the spinal unit (RQ1 and RQ2).

Case D001

Case D001 is a nurse educator at a VA hospital spinal cord injury unit. Her duties include continued education of staff and oversight of the PU prevention guidelines to clearly establish the mechanism of RQ1 allowing the potential for a good outcome of diminished PU development related to RQ1 based on the context or circumstance of proper education and knowledge corresponding to RQ2. She also provides continued education of hospital staff in the community supporting proper prevention mechanism (RQ1) and contexts or circumstances (RQ2). Her daily duties include, “making rounds and to visit all admissions within 24 hours.” She also makes weekly wound care rounds to make sure the staff is using clinical practice guidelines and wound management procedures (RQ1 and RQ2). D001 says clinical practice equates to proper execution of the PU prevention guidelines (RQ1) to assure pressure release (RQ1) by repositioning the SCI every 2 hours, which exemplifies proper mechanism (RQ1). Also, D001 said “There should be no use of bed pans that may cause pressure, and no diapers, so friction or

excess moisture can be avoided." This action establishes an environment aligning with a beneficial context or circumstance (RQ2 to promote PU prevention (RQ1)." Mechanism (RQ1) is contingent on proper execution and good care technique with awareness of all possible failures (RQ2) which may create a negative outcome (RQ1) or development of PUs. D001 went on to say, "One facility prevention strategy is for each SCI to be assessed by a wound nurse upon admission and on a regular basis," which corresponds to mechanism (RQ1) as part of the PU guideline execution. D001 said all SCI get an air flow mattress (RQ2), and she also stated the mattresses are reviewed each year. D001 reported in the interview, "I am continually teaching." She said, "It is important to council the staff on wound care and knowledge of care for QI (RQ2)." D001 is accenting how good education and continued learning will help establish proper execution of the prevention mechanism (RQ1) and help provide a healthy context or circumstance (RQ2) to create the chance for a better outcome (RQ1).

One of the interview questions for D001 was, "is there a medical reason QI or others cannot be repositioned in the ICU?" D001 answered, "Yes patients in the ICU can be repositioned, but they are on drips and connected to tubes, so a sanitized practice was created of lying on the back supine, because it is easier for staff to do their work if someone is kept in that position." As a researcher on the subject of PUs, I find this extremely important since according to Krupp & Monfre (2015) the ICU is one of the prime opportunities for a patient to develop a pressure wound ((RQ1 and RQ2). Information form D001 appears to express a general disregard for proper PU prevention guidelines (RQ2) in the ICU. The interviewee went on to say, "There are more hospital-

acquired wounds now because prevention measures are lacking, such as not turning patients and failure to implement PU guideline practices." This is an example of negative outcome (RQ1) based on improper execution of mechanism (RQ1). Also, according to D001, it appears that in general ICU management has created a context or circumstance (RQ2) in which an outcome (RQ1) of PU development may flourish, because having a patient lie in a supine position will be easier for the care team to carry out general treatment duties, which takes away the mechanism of repositioning (RQ1).

Case D002

Case D002 is a long time CNA who has been further trained by a respected nursing facility with quadriplegic, paraplegic, and elderly patients. She has worked for homecare agencies and for private clients over twenty years. D002 has taken the CNA theory class plus clinical training. Part of her nursing facility training included the stipulation that, "it is absolutely necessary to turn the patients from left to right and right to back every 2 hours," directly supporting good execution of the repositioning mechanism related to RQ1. In the nursing facility, D002 said "there are no special turn teams but there was a 'check off system' for tracking the turns, which helped establish a good context or circumstance of RQ2. "Ninety percent of the turn schedule is coordinated with the bowel schedule and a skin assessment," she said. This action appears to correlate to good management (RQ2) providing a healthy context or circumstance (RQ2) for the mechanism of PU prevention (RQ1) by streamlining the process (RQ1 and RQ2). In the interview, D002 was asked if she witnessed a PU develop during her work at the nursing home. She said, "On one occasion a lady came in with a knee problem and began to

complain of her lower back hurting. The knee rehab required the patient to be on her back, and after ten or fifteen days a pressure wound the size of a nickel developed." Because the context or circumstance (RQ2) mentioned above required the patient to be supine, execution of a good PU prevention mechanism (RQ1) was derailed and led to wound development or a negative outcome (RQ1). D002 said "the wound was a Stage I, but it opened." She said the second step for staff was to get an air flow mattress and wedges then treat the wound medically, which is a secondary example of mechanism (RQ1) with a goal to change or improve the outcome (RQ1). D002 stated in the interview that she is adamant about the use of an air flow mattress (RQ2), keeping the patient hydrated (RQ1), and monitoring of special equipment like braces (RQ2) to diminish friction, sheer, and pressure (RQ1). D002 is stating that air flow mattresses and special equipment are one foundation of mechanism establishing a context (RQ1 and RQ2) which may be used for the prevention of PUs (RQ1 and RQ2), but devices must be observed to prevent an outcome (RQ1) of wound creation.

Emergent Themes/Research Questions

By using NVivo 12 and manual evaluation of the interviews with QI, clinicians, and care providers or family members of QI, I have identified three emergent themes and five emergent subthemes. Each of the emergent themes are directly related to RQ1 or RQ2, while the subthemes identify additional issues and concerns corresponding to RQ1 and RQ2 about the execution of the PU prevention guidelines, which correlates to efforts that may decrease development of new PUs in acute care settings.

Emergent Theme 1

Research Question 1. Mechanism from RQ1 in this study is defined as the execution of the PU prevention guidelines for the purpose of preventing the outcome (RQ1) of PU development in an acute care setting. This emergent theme is directly related to RQ1. All participants have agreed that proper execution of the PU prevention guidelines is crucial and important to assure a good outcome in an acute care setting. According to RQ1, the mechanism in this study is a multilayered approach of skin assessment, recognition of wound stages and cause, repositioning of vulnerable patients every 2 hours, and treatment of wounds when diagnosed (see AHRQ, 2013; CDC, 2015; NPUAP, 2009). The core to these guidelines is the mechanism (RQ1) of repositioning the patient from right side to a supine position, and then to the left every two hours to relieve the pressure on the bony prominences to help facilitate the outcome (RQ1) of wound prevention (see AHRQ, 2013; CDC, 2015; NPUAP, 2009). Below I have created illustrations showing the proper execution of the repositioning mechanism (RQ1) as directed by the PU prevention guidelines (see AHRQ, 2013; CDC, 2015; NPUAP, 2009). Figure 1 below shows a twenty-degree turn angle with head down. Figure 2 shows a twenty-degree angle right turn to begin the process. Figure 3 shows a supine zero-degree position 2 hours later. Figure 4 shows a left turn in the final 2 hours to complete the three-stage process. At this point the process repeats with the right position, supine, and left turn et cetera, which is the core of the PU prevention guidelines and the mechanism (RQ1) in this study. Note the use of pillows and wedges to execute the turn angles.

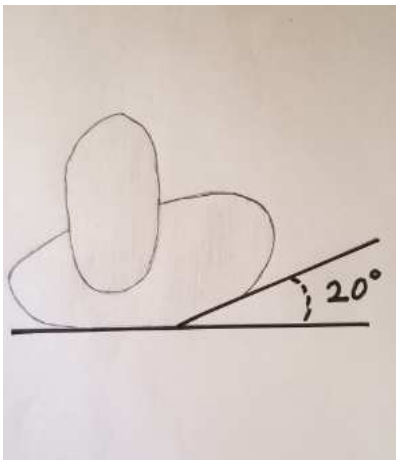

Figure 1. Twenty degree turn angle with head down.

Figure 2. Right turn twenty-degree angle to begin the process.

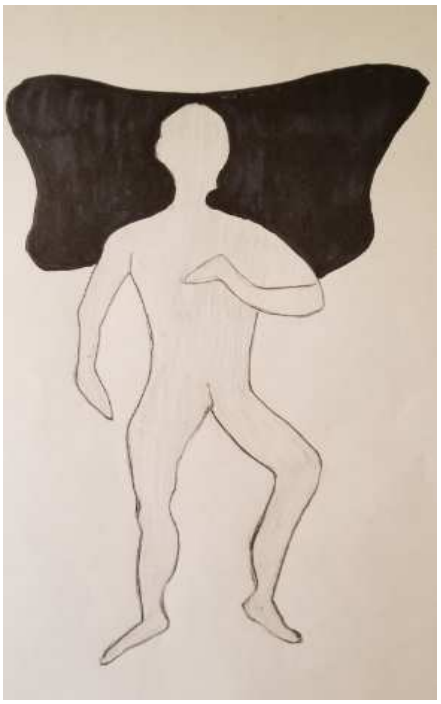

Figure 3. A supine zero-degree position 2 hours later.

Figure 4. A left turn in the final 2 hours to complete the three-stage process.

Case C009 stated, “In 2012, the staff should have repositioned me and given me an air mattress. I was not repositioned at all over a five-day period (RQ1 and RQ2).” Additionally, Case C005 reported, “I don’t recall any special attention paid to pressure ulcer prevention (RQ2).”

Emergent Theme 2

Research Question 2. Context from RQ2 in this study is defined as the events or circumstances that surround the execution of the PU prevention guidelines by acute care staff. Emergent theme two is directly related to context or circumstance (RQ2). Information from participant interviews have divulged how each acute care event will place a patient in a variety of contexts or circumstances during their care (RQ2). The patient may be aware of the events of their care or unaware of the processes which may begin in the emergency room setting proceeding to treatment. All patients expect quality care as context or circumstance unfolds, but participant interviews in this study have stated that the acute care staff is primarily focused on the diagnosis and treatment of medical needs and not every requirement of a QI such as PU prevention (RQ1). Within this context or circumstance (RQ2), processes are usually fulfilled, but according to QI participants, there are times for varying reasons that procedures fail (RQ2). Participants have reported, when a QI enters an acute care setting, they may need to express pertinent information specific to their care routine which will impact events from that moment forward (RQ2). If the QI is aware of the events, they will tell the staff about aspects of their life such as repositioning (RQ1) or the need of an air mattress (RQ2). Also, a QI may have an advocate such as a family member or care provider to express this pertinent

information (RQ1 and RQ2). If the QI is not aware of the events as they enter an acute care setting, they will rely on the staff to provide care within contexts or circumstances (RQ2) necessary to execute the PU prevention guidelines (RQ1). For example, participant interviews in this study indicate that if a QI is placed in a compromising context or circumstance (RQ2) such as being left on a gurney or not repositioned, the skin can be quickly compromised. For example, Case C009 states, "If you are left on a gurney like in the ER within a couple of hours your blood vessels start to die because of lack of oxygen." Case C009 is explaining a context or circumstance (RQ2) which can lead to a negative outcome of PU development (RQ1).

Emergent Theme 3

Research Question 1 and Research Question 2. The context or circumstance in RQ2 sets the stage for the implementation of the mechanism of RQ1 which leads to an outcome noted in research question one (RQ1). In emergent theme three, interview information and other sources of data show correlations implicating a culture of staffing decisions and administrative actions which can directly impact mechanism and outcome (RQ1) through context or circumstance (RQ2). As mentioned above under emergent theme two, a QI will need special and specific treatment in order to maintain optimal health. One of these specific needs is the execution of the PU prevention guidelines coordinated with skin assessment or mechanism (RQ1). If these procedures are followed, a QI has improved chances of the best outcome (RQ1) maintaining good personal health and the potential to avoid unforeseen developments such as PU development related to outcome (RQ1).

Outcome (RQ1) in this study is the reality that a pressure wound occurred or did not occur. Information from participant interviews indicate that the outcome (RQ1) may vary according to the acute care facility in question based on the culture (RQ2) that exists in each institution. Context or circumstance (RQ2) in this study is defined as the events or circumstances within the facility culture, staff decisions, and administrative actions which supports how the acute care staff executes the PU prevention guidelines or mechanism (RQ1). Participant interviews have accentuated elements of context or circumstance (RQ2) corresponding to facility culture such as nurse education along with well managed procedures which can make all the difference in patient care highlighting RQ2. For example, a University of Virginia Health System [UVA] (2017) showed improvement over a 2 year period in the development of hospital-acquired PUs by practicing the PU prevention guidelines correlated to mechanism (RQ1) and by providing a culture or context (RQ2) to positively impact the presentation of the mechanism (RQ1). In the University of Virginia study, the number of patients with a PU were divided by the number of individuals surveyed to arrive at a quotient based on the stage of PUs indicated between zero wounds to Stage IV PUs. The UVA data was later compared to the benchmark provided quarterly by the National Data Base of Nursing Quality Indicators (UVA, 2017). The delivery of a lower number is the better result. The culture change at the University of Virginia began in July 2015 with a PU quotient of 3.5 (UVA, 2017). By April 2016, the PU quotient had dropped to 2.0 closely in line with the benchmark (UVA, 2017). Hence, creation of a healthy culture or context (RQ2) fostering the proper execution of the PU prevention guidelines (RQ1) made a significant difference in the

outcome (RQ1) of PU development for the University of Virginia Health System (UVA, 2017).

All QI participants interviewed in this study agreed that regular repositioning every 2 hours according to the mechanism of PU prevention guidelines (RQ1) significantly diminished the potential for development of new PUs or outcome (RQ1). To achieve better outcomes, some facilities have created a culture relying on electronic health records and good team communication to execute procedures (RQ1), corresponding to a form of the mechanism (RQ1) with a goal of improving outcome (RQ1) by creating a beneficial context or circumstance (RQ2) where the processes (RQ1) can be presented optimally (Sailor, White, Boldt, Post, & Lay, 2013; Talsma et al., 2011).

One problematic culture related context (RQ2) for patients is the ICU where PU development is significant, highlighting a negative outcome (RQ1) (Bandeira et al., 2014; Krupp & Monfre, 2015). Case D001, who teaches the PU prevention guidelines, has indicated that repositioning (RQ1) can be accomplished in the ICU which would improve the context or circumstance (RQ2). However, D001 continues to add that staff finds it easier to do work if the patients are all supine lying on their back because of necessary tubing, which establishes a context (RQ2) creating potential for a negative outcome of PU development (RQ1). According to Pickham, Pihulic, Valdez, Mayer, Duhon, & Larson (2018), repositioning in the ICU (RQ1) or changing the culture (RQ2) while adhering to the PU guidelines (RQ1) can exhibit a beneficial outcome (RQ1), creating the atmosphere for good prevention procedures (RQ1 and RQ2).

A turn procedure study implemented in a Northern California ICU to indicate the compliance involved 555 patients and forty-five thousand hours of repositioning procedure was monitored with electronic sensors (Pickham et al., 2018). An unacceptable result in the Northern California study indicated less than optimal turn compliance of 50 to 60 percent which highlights improper presentation of mechanism (RQ1) (Pickham et al., 2018). Furthermore, the Northern California ICU culture created context or circumstances (RQ2) where lack of regular repositioning (RQ1) could have been crucial to the outcome (RQ1) of PU development (Pickham et al., 2018). Also, Pickham et al. (2018) indicated a variance in turn compliance related to sex, age, and race combined with the weight of the patient which is an expression of the context or circumstance (RQ2) involving facility culture that may impact the mechanism (RQ1). Overall, the Northern California study highlights important visions of this current study where the context (RQ2) or facility culture (RQ2) and its relationship to RQ1 show how circumstance (RQ2) may impact the outcome (RQ1) because the mechanism (RQ1) is not executed correctly.

Emergent Subtheme One

Research Question One. Staffing in healthcare is an issue that balances between patient care and the economics that propels an acute care setting to become a successful business (Franke, 2008; Krupp & Monfre, 2015). Elements such as number of staff and the existence of repositioning turn teams are directly related to economics and patient care of QI and SCI (see Franke, 2008; Krupp & Monfre, 2015; Soban et al., 2011). In this study, the participants have reported the staff in an acute care setting to be focused on a

solution to medical problems first and foremost, which sets the stage for context or circumstance (RQ2) and secondly addresses the needs of the vulnerable QI individuals corresponding to PU prevention or mechanism (RQ1). QI Participants in this study felt needs were met sometimes and requests were resisted others, depending on the facility and individual staff members. QI participants said the execution of the PU prevention guidelines (RQ1) were a secondary consideration in the context of emergency room (ER) treatment (RQ2). However, they reported some staff utilized the guidelines, and others accepted patient input to perform repositioning to relieve pressure upon request, which is a positive outlook on the context (RQ2) and the processes (RQ1). However, some of the QI participants felt they needed to be repositioned in the ER (RQ1) but were not turned without request (RQ2). None of the QI participants received an air mattress for extended time in the ER exemplifying context (RQ2) which would support presentation of the PU prevention guidelines or mechanism (RQ1), However, those who requested an air flow mattress were accommodated upon final admission to a regular hospital room (RQ2). QI Case C0011 stated that in multiple visits to the VA no repositioning turn team was recognized correlating to the context (RQ2), but staff in the spinal cord injury unit executed the PU prevention guidelines efficiently (RQ1). Case C002 stated, “I don’t believe staff at hospitals are used to spinal injury patients. I was in the ER. I was not repositioned (RQ1), and the staff never talked to me about repositioning. No PU prevention was addressed (RQ2).” This input from Case C002 highlights the way staff approaches tasks in an acute care facility or context (RQ2), which can impact the mechanism (RQ1). Information from Case C004 indicated they were not repositioned

during their stay in the ICU in 2014 indicating how staff operates in that department creating a context (RQ2) which improves the execution of the PU prevention mechanism (RQ1). Also, Case C003 said, “The staff totally ignored my mon and dad’s warning about the little red dot that later became a severe wound, and I believe the staff should have given me more information about skin breakdown right after my injury.” These elements in Case C003 are examples of context and circumstance (RQ2) or staff communication in an acute care facility (RQ2). Case D001 stated from the clinician perspective that the ICU usually has one staff personnel for two beds, and in a regular unit six clinicians oversee thirty patients (RQ2), highlighting staffing procedures and administrative policy. The participant interviews have indicated context and circumstance (RQ2) created by staffing policy to be a crucial issue related to the execution of the PU prevention guidelines or mechanism (RQ1).

Emergent Subtheme 2

Research Question 1 and Research Question 2. Continued education of existing acute care staff is a theme that all of the QI, clinician, and care provider or family member participants have agreed is a priority for deterring PU in an acute care facility. According to participant interviews, knowledge of PU and the QI condition by staff (RQ2) affected consistent execution of guideline procedures the most, which highlights how continued education (RQ2) can support the proper presentation of the PU prevention mechanism (RQ1). Continued education recognized in this subtheme by participants is related to teaching understanding of the mechanism (RQ1) or the execution of the PU prevention guidelines which can help set the stage for staff actions corresponding to

context or circumstance (RQ2). Furthermore, understanding and knowledge of the execution of the PU prevention guidelines is the basis for continued reminder to staff about the vulnerable populations such as QI, creating context or circumstance (RQ2), which can lead to a more favorable outcome (RQ1). According to Case D001, "I am always teaching (RQ1 and RQ2)." Case E001 stated, "The nurses have no idea what to do for QI care (RQ1 and RQ2)." Case C009 shared an example, "In 2012 when I went to the ER, the staff did not asses my skin," exemplifying mechanism (RQ1) which creates a context (RQ2) setting the stage for a less favorable outcome (RQ1). Case C001 said, "The ER is not set up for quadriplegics with pressure ulcers (RQ2)." Statements from Case C004 include, "I don't know; the staff seemed clueless about quadriplegia (RQ2), and I don't think repositioning (RQ1) would have been handled well if I had not of requested it." Also, Case C004 said, "They could have communicated with my caregiver or family, and there was no shared information about PU prevention. No skin assessment was done." This statement from Case C004 shows lack of communication by staff related to context or circumstances (RQ2), and improper presentation of mechanism (RQ1) is underscored by not assessing the patient's skin. Finally, Case D001 said, "If more hospital-acquired wounds are occurring now in a unit, it is largely due to lack of implementation of PU preventive measures like repositioning. Continued education is a must." Case D001 has made an important point from the educator's view about the importance of continued education impacting the mechanism (RQ1) or PU prevention, and how knowledge relates to context (RQ2) and the outcome (RQ1).

Emergent Subtheme 3

Research Question 1 and Research Question 2. Education of new acute care staff is a priority to improve the culture in acute care settings and may foster prevention of PUs (see Lang et al., 2004; Raingruber, Teleten, Curry, Vang-Yang, Kuzmenko, Marquez, & Hill, 2010; Sailor et al., 2013). Participants in this study have reported that new staff must obtain the knowledge to execute the mechanism (RQ1) or the PU prevention guidelines. Once mechanism (RQ1) is understood one should be more likely to execute the PU prevention no matter what the context or circumstances (RQ2), and a positive outcome (RQ1) can occur in a larger number of cases. It has been learned in the participant interviews that staff may have engaged in miscommunication, lack of knowledge, and refusal to listen to patient or family advice, creating context or circumstance for QI (RQ2) where possible development of PUs can occur. Also, participants agree that contexts or circumstances (RQ2) have prevented the execution of PU guidelines when prevention should be a priority (RQ1 and RQ2). The culture of PU prevention cannot improve unless new staff are indoctrinated in these basic procedures concerning vulnerable populations such as QI (RQ1 and RQ2) (see Lang et al., 2004; Raingruber et al., 2010; Sailor et al., 2013)

Emergent Subtheme 4

Research Question 1 and Research Question 2. Patient awareness is extremely important especially for vulnerable populations like QI or SCI (FRI, 2013; Ghaisas et al., 2015). Awareness is part of the context or circumstance (RQ2) a patient finds themselves in while admitted to an acute care setting. If a QI patient is not aware of their

circumstances, developments can occur such as failure to execute the PU prevention guidelines (RQ1) (FRI, 2013; Ghaisas et al., 2015). For instance, Case C001 stated, "I taught the staff how I needed my routine to be performed." In this example, Case C001 is establishing a positive context or circumstance (RQ2) for the prevention of PUs or mechanism (RQ1) with the hope that no wounds will occur as the outcome (RQ1). Also, Case C001 said, "If I go to the ER, I tell them if I have pressure ulcer (RQ2)." All of the QI participants agree that their personal awareness is crucial during visits to an acute care facility (RQ2).

Emergent Subtheme 5

Research Question 1 and Research Question 2. Advocacy by a caregiver or family member is a support for patient awareness (see AHRQ, 2013; CDC, 2015; FRI, 2013; NPUAP, 2009). The participant interviews in this study have indicated that successful admission to an acute care facility can rely on the patient having an advocate. Participant interviews have stated that advocacy can establish a healthy context or circumstance (RQ2), setting the stage for proper execution of the PU prevention mechanism (RQ1) which leads to probability of a better outcome (RQ1). Case C001 said, "My care provider stayed overnight (RQ1 and RQ2)." Case C002 stated, "My mother is my care provider, and she was with me on all visits to the hospital (RQ1 and RQ2)." Case C003 reported, "My mom and dad were there in the hospital day and night (RQ1 and RQ2)." Case C008 said "I had my care provider with me during my stay in the ICU to help with repositioning (RQ1 and RQ2)." Each of these participant statements highlights the importance of patient advocacy and exemplifies the establishment of a context (RQ2)

which can improve the execution of the PU prevention mechanism (RQ1) and help deliver a successful outcome (RQ1) where no new wound occurs.

Emergent Theme Recap

Efforts have been made to diminish PUs in acute care facilities (AHRQ, 2013; CDC, 2015, NPUAP, 2009). I have outlined insights from QI, clinicians, and family members or care providers of QI stating their views, experiences, and ideas on the success or improvement of the PU prevention guidelines in acute care settings. The emergent themes and subthemes in the results presented above expresses the participant viewpoint on PU prevention. The Joint Commission has also completed a study of interventions to positively affect the execution of the PU prevention or mechanism (RQ1) with the aim of improving acute care related to PUs and exhibit an outcome (RQ1) of fewer wounds developed (Soban, Hempel, Munjas, Miles, & Rubenstein, 2011). The Joint Commission study addressed issues surrounding the mechanism (RQ1), context (RQ2), and outcome (RQ1 and RQ2) referred to in emergent themes and subthemes from this qualitative research (see Soban et al., 2011). All QI participants interviewed in the current study have highlighted most points in the Joint Commission report as a means to diminish the outcome (RQ1) of PU development in acute care facilities with proper execution of the mechanism (RQ1) of prevention guidelines. The Joint Commission study incorporates efforts to improve the context or circumstances (RQ2) and execution of the PU prevention guidelines, which supports the data and results of this current qualitative research. Table 1 below compares the emergent themes in this current research (RQ1 and RQ2) with the Joint Commission study (see Soban et al., 2011).

Table 1

Emergent Theme Recap and Comparison to "Definitions and Frequencies of the Most Commonly Employed Intervention Components" by the Joint Commission

Theme number	Joint Commission Study Relationship to Research Questions
Emergent Theme 1	Execution of the PU prevention guidelines (RQ1) Protocol Development (RQ1) Implementation of protocol-based care (RQ1)
Emergent Theme 1	Utilize published guidelines (RQ1)
Emergent Theme 1	Implementation of PU assessment scale (RQ1)
	Risk Assessment Tool utilization (RQ1)
Emergent Theme 2	Use of new equipment, proper protective beds, and surfaces (RQ2) Beds/ Support surfaces (RQ2)
Emergent Theme 2	Provision of feedback to Nurse Managers/ create awareness of intervention progress (RQ1 and RQ2)
Emergent Theme 3	Collection of outcome data (RQ1 and RQ2)
Emergent Subtheme 1	Assembly of a new team plan intervention (RQ2) Staffing (RQ2)
Emergent Subtheme 2 and 3	Use written, didactic, and other means to improve nurse understanding of PU prevention (RQ2)
	Staff Education (RQ2)
Emergent Subtheme 2	Identification of nursing staff to receive additional training (RQ2)
Emergent Subtheme 4 and 5	Patient personal awareness (RQ1 and RQ2)
	Patient advocacy by family member or care provider (RQ1 and RQ2)

Note. The Joint Commision/ June 2011

Summary

In Chapter 4, I have provided detailed information gathered in the participant interviews and an explanation of the convergence of thoughts on the issue of execution of the PU prevention guidelines in acute care settings. I have shown how information from participants aligns with the research questions. I have provided an in-depth description of the interview thoughts related to the research questions depicting how the mechanism of execution of the PU prevention guidelines is crucial to QI wound prevention, and how the context and circumstances occurring in an acute care facility directly impacts the outcome of PU development. The results of these interviews confirm agreement that QI and other vulnerable individuals have a drastically greater chance of avoiding new PU wounds if acute care facilities adhere to the PU prevention guidelines. Also, the participants have agreed that a variety of contexts or circumstances such as the number of staff members, education of facility personnel on the subject of the PU guidelines and processes, and just plain neglect during care may lead to a variety of outcomes including the development of new wounds. In Chapter 5, I will provide a comprehensive interpretation of the findings and an overview of ideas that may influence limitations, recommendations, implications, and the conclusion of the study.

Chapter 5: Discussions, Conclusions, and Recommendations

Introduction

The purpose of this qualitative study was to examine the effectiveness of acute care guidelines for the prevention of PUs in QI by drawing insight from various sources of data. QI were specifically selected as participants because they are among the most vulnerable for the development of PUs (see AHRQ, 2016; Kim et al., 2016; Kryczka, T. & Grieb, 2014). The QI participants were interviewed to gain insights into their personal experiences with PU development and execution of the PU prevention guidelines while admitted to an acute care setting (see AHRQ, 2016; NPUAP, 2014a; Stansby et al., 2014). Additionally, QI were interviewed because researchers believe QI and SCI have important knowledge that could impact the delivery of prevention techniques for PUs and help diminish these AE in the healthcare system (see Latimer et al., 2014; Marin et al., 2013; McInnes et al., 2014).

This case study utilized the qualitative method involving semi-structured phone interviews with QI to evaluate perspectives about their relationship as patients with providers who executed the PU prevention guidelines in an acute care setting (see Creswell, 2013). Clinicians with knowledge of the PU prevention guidelines and care providers or family members of QI were also interviewed to give a comprehensive picture of PU development while exploring experiences of the QI, acute care organizations, events, programs, and processes related to the execution of PU prevention guidelines (see Rudestam & Newton, 2015; Baxter & Jack, 2008). Phone interviews were

used due to location and logistics involving the QI participants, clinicians, and care providers and family members who lived in various places in the United States.

One of the key findings in this study was a strong support by participants that the PU prevention guidelines are efficient and are one of the primary defenses for preventing a pressure wound (see AHRQ, 2016; NPUAP, 2014a). QI utilize the guidelines daily as part of their PU prevention routine. However, the main finding of this study was that the PU prevention guidelines are not always executed properly or utilized at all for vulnerable patients like QI in acute care settings. There are various reasons for this failure, but staffing, education, and knowledge of PU and PU prevention are key implications.

Interpretation of Findings

The theory of protocol-based care (PBC) is the theoretical framework supporting the perspective of QI and their experiences about execution of the PU prevention guidelines in acute care settings (see Rycroft-Malone et al., 2010). PBC involves standardization of patient care in which the mechanism of prevention or treatment and context or circumstance of execution affects the outcome (Chandler et al., 2013; Pawson & Tilley, 2004; Rycroft-Malone et al., 2010). The key mechanism under investigation in this study is the PU prevention guidelines and particularly the repositioning aspect of the process (see AHRQ, 2016; NPUAP, 2014a). Much of the research on PUs is of a quantitative nature involving the mechanism of recognition and treatment of wounds with antibiotics and surgical procedures (Alvarez et al., 2010; Ayello, 2014; Black et al., 2015; Black et al., 2007; Edsberg, et al., 2016; Rycroft-Malone et al., 2010; Rubayi,

2015; Singer et al., 2016). The development of tools such as the Braden Scale have been a healthcare priority for standardization of the mechanism of prevention and diagnosis of PU (Bergstrom et al., 1988; Cox, 2011; Rycroft-Malone et al., 2010). This case study is unique because QI who are one of the most vulnerable populations for development of PUs were able to give personal insights (see AHRQ, 2016; NPUAP, 2014a). It is important that QI or SCI were given an opportunity to share their experiences about the PU prevention guidelines executed in acute care settings because they have valuable first-hand information (see Latimer et al., 2014; Marin et al., 2013; McInnes et al., 2014).

QI need those who care for them to adhere to their personal regimen or routine in order to prevent PUs, which includes repositioning according to the PU prevention guidelines (see AHRQ, 2016; NPUAP, 2014a). This requires clinicians in acute care settings to follow specific instructions from QI about mechanisms of their care while in an emergency room or while admitted to a facility (see AHRQ, 2016; NPUAP, 2014a; Rycroft-Malone et al., 2010). QI often rely on care providers, family members, or advocates in emergency rooms or situations away from home, but these individuals are not always available. The participants in this study have agreed the PU guidelines work as the most plausible means of preventing PUs. Specifically, participants in this study have pointed out the utilization of the repositioning every 2 hours is the most effective prevention to deter the development of a PU because the process creates a context or circumstance that relieves the pressure on bony prominences allowing proper blood flow (see AHRQ, 2016; NPUAP, 2014a; Rycroft-Malone et al., 2010). Some participants shared experiences where the clinicians in acute care facilities followed the prevention

guidelines without any problems. However, some of the experiences of participants involved neglect by clinicians for extended periods of time, resistance to QI feedback, and refusal to comply with patient input which was, according to participants, detrimental to positive contexts or circumstances related to care (see Rycroft-Malone et al., 2010). This is a crucial aspect of this study showing the importance of the PU prevention guidelines described in the literature from the QI experience, and the differentiation related to execution of preventive measures from one acute care setting to another extending the knowledge on this subject. This study points out that by not following the PU prevention guideline mechanism (see AHRQ, 2016; NPUAP, 2014a) clinicians are refusing to support the current literature on the subject and are creating potential contexts or circumstances which may lead to negative outcomes highlighting new knowledge on PU development in acute care settings (see Rycroft-Malone et al., 2010).

The QI participants in this study have agreed that education of clinical staff is a priority to prevent PUs and to improve the mechanism of care which aligns with previous research (see AHRQ, 2016; NPUAP, 2014a; Rycroft-Malone et al., 2010). The QI participants feel that clinicians may need extended refresher courses in the ramifications of PUs and the use of the PU prevention guidelines. QI participants have said in interviews that knowledge through education for clinicians is the most important means of preventing PUs in acute care settings by creating better context or circumstance and a more positive outcome for care which aligns with the current literature (see AHRQ, 2016; NPUAP, 2014a; Rycroft-Malone et al., 2010). Efforts have been made to improve the PU prevention mechanism in acute care settings such as creation of turn teams to

facilitate repositioning for bed bound patients (see AHRQ, 2016; NPUAP, 2014a; Rycroft-Malone et al., 2010). However, staffing issues have been sighted as a concern for the QI participants related to the context or circumstance in PBC (see Rycroft-Malone et al., 2010). Participants have acknowledged that inadequate staff on duty diminished the ability to perform the repositioning mechanism aspect of the PU prevention guidelines or to create turn teams (see Rycroft-Malone et al., 2010; AHRQ, 2016; NPUAP, 2014a).

In this study, participants have experienced failures on the part of the clinical staff in acute care facilities which involve mechanism and context or circumstance of PBC (see Rycroft-Malone et al., 2010). Several of the QI participants and care providers and family members have expressed concern that acute care clinicians prioritize the process of medical treatment and overlook aspects of QI care like the repositioning mechanism or ignore it all together (see Rycroft-Malone et al., 2010). Some QI were left unattended on hard beds or a gurney for extended periods of time without repositioning, creating a negative context or circumstance mechanism (see Rycroft-Malone et al., 2010). Some participants shared events (contexts or circumstances) where the clinical staff said they would take care of the treatment and the QI, care provider, or family member input was not needed or warranted (see Rycroft-Malone et al., 2010). In these cases, the QI and care providers were very concerned about personal care and the execution of the PU prevention guidelines and the potential for negative outcomes (see Rycroft-Malone et al., 2010). This new QI knowledge from the current study indicates that these above mentioned failures to execute the PU guidelines properly could easily lead to the negative

outcome of PU development in a very short period of time (see AHRQ, 2016; NPUAP, 2014a; Rycroft-Malone et al., 2010).

Limitations of the Study

The main limitation for this study includes the lack of access to a larger group of participants. After receiving rejections from VA Hospital Spinal Cord Unit in Seattle, Washington and Northwest Regional Spinal Cord Injury System of University of Washington Medicine, I was able to connect with participants through the Quad-List of QI helping each other. The Quad-List was a good source of participants, but many who expressed initial interest where reluctant to officially join the study. The sample size could be seen as a weakness for the study (see Creswell, 2013; Mason, 2010; Miles et al., 2014), and the small sample size of the study may diminish the transferability and generalizability of the results (see Creswell, 2013). However, the participants from each category of QI, clinicians, and care providers or family members provided agreement on the information they offered about the PU prevention guidelines executed in acute care setting which provided a saturation component for the study (see Dworkin, 2012; Mason, 2010).

Recommendations

There are several recommendations that can be made for future research based on this current study. First, I recommend that acute care facilities consistently utilize the PU prevention guidelines based on evidence provided by the National Pressure Ulcer Advisory Panel and the Agency for Healthcare Research and Quality (see AHRQ, 2016; NPUAP, 2014a). The participants in this study have all acknowledged inconsistency in

execution of the PU prevention guidelines as a major problem in acute care settings. Although some acute care facilities used the guidelines properly it has been noted by participants in this study that some were reluctant to execute the simple repositioning technique without coercion. Many of the participants related situations where repositioning to prevent PUs was only accomplished with strict oversight by the patient. Since repositioning remains the simplest and most direct means of relieving pressure distribution on skin surfaces and bony prominences (see AHRQ, 2016; NPUAP, 2014a), further research should be done concerning the education of clinicians about the use of repositioning and the execution of the PU prevention guidelines. It is recognized that patients are extremely vulnerable to PU in the ICU due to immobility (see Krupp & Monfre, 2015; Pinkney, 2014). One participant clinician has given insight that patients can be repositioned from side to side in the ICU according to the PU prevention guidelines, and that the lack of repositioning is an administrative decision which creates an easier routine for the nurses and clinicians in the department. Further research should be done to resolve ways to incorporate repositioning technique in the ICU and help protect sedentary patients who are vulnerable to PUs due to improper weight distribution on bony prominences. Each practitioner or clinician should fully understand the positive rewards of the repositioning technique. Also, more research should be done on the establishment of acute care repositioning teams and ways to incorporate patient turning into the daily routine cost effectively. To facilitate turning teams, further research should be done on staff management and ways to provide the necessary PU prevention. According to Burton et al. (2018), nurse managers can develop plans to understand the

workforce compared to program theory and provide practical application of evidence-based processes by evaluating the context, mechanisms, and potential outcome. Additionally, further study should be done to indicate the effectiveness of practitioner education on the recognition of new PU wounds and the proper first lines of treatment. Some of the participants in this study indicated that clinicians were not fully aware of the initial stages of PUs nor did they understand the full extent of pressure wound development and the impact on the patient. Also, further research should be done to expand knowledge on beds and surfaces which are meant to prevent PUs. More research should be done to understand the effectiveness of prophylactic dressings that are placed between the patient and surfaces to prevent PUs in challenging situations as indicated by Clark et al. (2014). According to Black, Santamaria, Gefen, Kottner, and Alves (2019), bioengineering of surfaces and repositioning products has shown to be beneficial in preventing pressure wounds, but more research is necessary to understand which products are best options for preventing PUs.

Implications

Providing quality healthcare for all individuals is a priority, and making sure QI, SCI, and other vulnerable populations receive care that prevents unnecessary suffering or AE is a must. The implications of this study are clear that a simple well-founded technique like repositioning a patient every 2 hours is a positive means to help prevent PU in acute care settings and in the community. PU prevention is a complicated multi-faceted issue and participants in this study have indicated that constant vigilance concerning PUs does not always work. However, execution of the PU prevention

guidelines does offer a simple defense and allow the QI, SCI, and other vulnerable populations a way to avoid severe injury, illness, or death (see AHRQ, 2016; NPUAP, 2014a). This study implicates the need for conscientious restructuring of acute care culture to provide the proper education about spinal cord injury and the potential for PU development. Reevaluation of the educational programs for practitioners and development of new diligent cost-effective ways to reposition patients will provide social change by preventing many unnecessary pressure wounds and AE to the millions of affected patients in the United States (Smith et al., 2013). Social change is further implicated by proper execution of patient repositioning and other aspects of the PU prevention guidelines which will help diminish the annual $9.1 billion to $11 billion cost in treatment, rehospitalization, and malpractice suits affecting QI, SCI, the elderly, and other bed-ridden vulnerable populations who have acquired PUs (see Bruce et al., 2012).

Conclusions

The purpose of this qualitative study was to examine the effectiveness of acute care guidelines for the prevention of PUs in QI by drawing insight from various sources of data. In this multiple case qualitative study, I investigated the experiences of QI regarding their interactions with acute care settings. I specifically received QI insights into the execution of the PU prevention guidelines in acute care settings and in the community. Recent literature was reviewed to uncover the status of PU prevention at the present. Through first-hand experiences of QI, care providers, and clinicians, I uncovered the existence of inconsistency in the execution of the PU prevention guidelines in acute care settings, where it can be common for vulnerable populations to develop PU. This

inconsistency has left a gap in the care for QI and many vulnerable patients. For this reason, it was important to have heard acute care experiences of the quadriplegic participants in this qualitative study. The results of this study can create opportunities for administrators of acute care settings to reevaluate the execution of the PU prevention guidelines and in particular the repositioning facet of the program. Because the repositioning aspect of PU prevention is one of the simplest, inexpensive, and perhaps the most efficient option to prevent PUs, this step in the guideline program cannot be overlooked. I believe like the QI participants in this study that repositioning is a priority for PU prevention. I also believe that acute care management must incorporate proper execution of the PU prevention guidelines in order to provide quality care for QI, SCI, the elderly, and all bed-redden vulnerable patients.

References

Ackroyd-Stolarz, S., Bowles, S. & Giffin, L. (2014). Validating administrative data for the detection of AE in older hospitalized patients. *Drug Health and Safety*, (6), 101-108. doi:10.2147/DHPS.S64359

Agency for Healthcare Research and Quality. (2013). Comparative effectiveness review (cer-90) pressure ulcer treatment: comparative strategies ahrq. Retrieved from http://www.effectivehealthcare.ahrq.gov/ehc/products/308/1491/pressure-ulcer-treatment-report-130508.pdf

Agency for Healthcare Research and Quality. (2016). National Guideline Clearing House. Guideline summary. Retrieved from https://www.guideline.gov/summaries/summary/50473

Agrawal, K. & Chauhan, N. (2012). Pressure ulcers: back to the basics. *Indian Journal of Plastic Surgery*, 45(2), 244–254. doi:10.4103/0970-0358.101287

Akca, N., Aydin, G., & Gumus, K. (2015). Pressure ulcers and their associated factors in nursing home inmates. *Journal the College of Physicians and Surgeons Pakistan*. 25 (1): 27-30. Retrieved from http://www.jcpsp.pk/archive/2015/Jan2015/08.pdf

Alvarez, A., Lacalle, J., Canavate M., Alonso-Alcoanda, D., Lara-Celador, I., Alvarez, F., & Hilario, E. (2010). Cell death. a comprehensive approximation. necrosis. *Microscopy: Science, Technology, Applications and Education*. Retrieved from http://www.formatex.info/microscopy4/1017-1024.pdf

Antokal, S., Brienza, D., Bryan, N., Herbe, L., Logan, S., Maguire, J., … Siddiqui, S. (2012). Friction induced skin injuries- are they pressure ulcers? *A National*

Pressure Ulcer Advisory Panel White Paper. 2012 Nov: p. 1-3. Retrieved from https://www.npuap.org/wp-content/uploads/2012/01/NPUAP-Friction-White-Paper.pdf

Ayello, E. (2014). Pressure ulcer staging. *Medicare Quality Initiatives IRF-Training*. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/IRF-Quality-Reporting/Downloads/IRF-QRP-Training-%E2%80%93-PrU-Staging-May-12-2014-.pdf

Ayre, C. & Scally, A. (2014). Critical values of lawshe's content validity ratio: revisiting the original methods of calculation. *Measurement and Evaluation in Counseling and Development*, 47(1), 79-86. doi:10.1177/0748175613513808

Backhaus, M., Citak, M., Tilkorn, D., Meindl, R., Schildhauer, T., & Fehmer T. (2011). Pressure sores significantly increase the risk of developing a fournier's gangrene in patients with spinal cord injury. *Spinal Cord*, 49(11):1143-6. doi:10.1038/sc.2011.75

Balzer, K. & Kottner, J. (2015). Evidence-based practices in pressure ulcer prevention: lost in implementation? *International Journal of Nursing Studies*, 52(11), 1655-1658. doi:10.1016/j.ijnurstu.2015,08.006

Bandeira, T., Carmagnani, M., Pignatti, M., Blanes, L., Carneiro, I., Canteras, L., & Tanaka, L. (2014). Pressure ulcers in a university hospital: a review of nursing records. *Wounds*, 26(2), 14-20**.** Retrieved from http://www.woundsresearch.com/article/online-exclusive-pressure-ulcers-university-hospital-review-nursing-records

Bauman, C., Milligan, J., Lee, F., & Riva, J. (2012). Autonomic dysreflexia in spinal cord injury patients: an overview. *The Journal of the Canadian Chiropractic Association*, 56(4), 247-50. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3501908/

Baxter, P. & Jack, S. (2008). Qualitative case study methodology: study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544-559. Retrieved from http://www.nova.edu/ssss/QR/QR13-4/baxter.pdf

Bentler, S., Morgan, R., Virnig, B., & Wolinsky F. (2014). The association of longitudinal and interpersonal continuity of care with emergency department use, hospitalization, and mortality among medicare beneficiaries. *PloS One*. 9(12), doi:10.1371/journal.pone.0115088

Bergman D. & Collins, G. (2004). The law of cause and effect dominant principle of classical physics. *Foundation of Science*. August 2004. Retrieved from http://www.commonsensescience.org/pdf/articles/law_of_cause_and_effect_fos_v7n3_causality.pdf

Bergstrom, N., Braden, B., Kemp, M., Champagne, M., & Ruby E. (1988). Predicting pressure ulcer risk: a multisite study of the predictive validity of the Braden scale. *Nursing Research*, 47(5), 261-269. Retrieved from http://journals.lww.com/nursingresearchonline/Abstract/1998/09000/Predicting_Pressure_Ulcer_Risk__A_Multisite_Study.5.aspx

Black, J., Baharestani. M., Cuddigan. J., Dorner, B., Edsberg, L., Langemo, D.,…Taler, G. (2007). National pressure ulcer advisory panel's updated pressure ulcer staging

system. *Urologic Nursing*, 19(4), 343-349. Retrieved from https://www.suna.org/download/members/unjarticles/2007/07apr/144.pdf

Black, J. Brindle, C. & Honaker, J. (2015). Differential diagnosis of suspected deep tissue injury. *International Wound Journal*. 2015 June: doi: 10:1111/iwj.12471

Black, J., Clark, M., Dealey, C., Brindle, C., Alves, P., Santamaria, N., & Call, E. (2015). Dressings as an adjunct to pressure ulcer prevention: consensus panel recommendations. *International Wound Journal*, 12(4), 484-8. doi: 10.1111/iwj.12197

Black, J., Santamaria, N., Gefen, A., Kottner, J., & Alves, P. (2019). Meeting report: addressing risk factors with evidence-based technologies for the prevention and treatment of pressure injuries in different healthcare settings. Wounds International. 2019: Vol 10 Issue 3. Retrieved from woundsinternational.com

Braden, B. & Bergstrom, N. (2007). Predictive validity of the braden scale for pressure sore risk in a nursing home population. *Research in Nursing and Health*, 17(6), 459-470. doi: 10.1002/nur.4770170609

Brazinova, A., Maidan, M., Leitgeb, J., Trimmel, H., & Mauritz, W. (2015). Facotrs that may improve outcomes of early traumatic brain injury care: prospective multicenter study in austria. *Scandinavian Journal of Trauma, Resuscitation, and Emergency Medicine*, 2015 July, 23:53. doi: 10.1186/s13049-015-0133-z

Brit, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: a tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, 26(13), 1802-1811. doi: 10.1177/1049732316654870

Brem, H., Maggi, J., Nierman, D., Rolnitzky, L., Bell, D., Rennert, R.,…Vladeck, B. (2010). High cost of stage IV pressure ulcers, *American Journal of Surgeons*. 200(4), 473-477. doi: 10.1016/j.amjsurg.2009.12.021

Brindle, C., Creehan, S., Black, J., & Zimmerman, D. (2015). The vcu pressure ulcer summit: collaboration to operationalize hospital-acquired pressure ulcer prevention best practice recommendations. *Journal of Wound Ostomy Continence Nursing*, 42(4),331-7. doi: 10.1097/WON.0000000000000151

Brown, T. & Kitterman, J. (2013). Developing a cost-effective pressure-ulcer prevention program in an acute-care setting. *Wound Care Advisor*. Retrieved from http://woundcareadvisor.com/developing-a-cost-effective-pressure-ulcer-prevention-program-in-an-acute-care-setting-vol2-no5/

Bruce, T., Shever, L., Tschannen, D., & Gombert, J. (2012). Reliability of pressure ulcer staging. a review of literature and 1 institution's strategy. *Critical Care Nursing Quarterly*, 35(1), 85-101. doi: 10.1097/CNQ.0b013e31823b1f22

Budgell, B. (2008). Guidelines to the writing of case studies. *The Journal of the Canadian Chiropractic Association*, 52(4), 199-204. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2597880/

Burt, T. (2013). Palliative care of pressure ulcers in long-term care. *Anals of Long-Term Care*, 21(3). Retrieved from http://www.annalsoflongtermcare.com/article/palliative-care-pressure-ulcers-long-term-care

Burton, C., Rycroft-Malone, J., Williams, L., Davies, S., McBride, A., Hall, B.,….Caulfield, M. (2018). NHS managers use of nursing workforce planning and development technologies: a realist synthesis. *Health Services and Delivery Research*, 6(36). doi: 10.3310/hsdr06360

Cano, A., Anglade, D., Stamp, H., Joaquin, F., Lopez, J., Lupe, L.,…Young, D. (2015). Improving outcomes by implementing a pressure ulcer prevention program (pupp): going beyond the basics. *Healthcare*, 3(3), 574-585. doi: 10.3390/healthcare3030574

Centers for Disease Control and Prevention. (2015). Pressure sores or ulcers. Retrieved from https://medlineplus.gov/pressuresores.html

Chan, B., Nanwa, N., Mittmann, N., Bryant, D., Coyte, P., & Houghton, P. (2013). The average cost of pressure ulcer management in a community dwelling spinal cord injury population. *International Wound Journal*, 10(4), 431-40. doi: 10.1111/j.1742-481X.2012.01002.x

Chandler, C., Dileberto, D., Nayiga, S., Taaka, L., Nabirye, C., Hayendeke, M.,…Staedke, S. (2013). The process study: a protocol to evaluate the implementation, mechanisms of effect and context of an intervention to enhance public health centres in tororo, ugnada. *Implementation Science*, 8(113). doi: 10.1186/1748-5908-8-113

Chou, C., Lee, W., Yeh, C., Shih, C., Chen, T. & Liao, C. (2015). Adverse outcomes after major surgery in patients with pressure ulcer: a nationwide population-based retrospective cohort study. *PLOS One*, 10(5). doi: 10.1371/journal.pone.0127731

Chou, R., Bougatsos, C., Blazina, I., Starmer, A., Reitel, K., & Buckley, D. (2013). Pressure ulcer treatment starategies: a systematic comparative effectiveness review. *Annals of Internal Medicine*, 159(1), 28-38. doi: 10.7326/0003-4819-159-1-201307020-00006

Ciarlettaa, P. & Ben Amar, M. (2011). Papillary networks in the dermal-epidermal junction of skin: a biomedical model. *Mechanics Research Communications*, 42, 68-76. doi: 10.1016/j.mechrescom.2011.12.001

Clark, M., Black, J., Alves, P., Brindle, CT., Call, E., Dealey, C., & Santamaria, N. (2014). Systematic review of the use of prophylactic dressings in the prevention of pressure ulcers. *International Wound Journal*, 11(5), 460-71. doi: 10.1111/iwj.12212

Clark, F., Pyatak, E., Carlson, M., Blanche, E., Vigen, C., Hay, J.,…Azen, S. (2014). Implementing trials of complex interventions in community settings: the usc-rancho los amigos pressure ulcer prevention study. *Euro Pub Med Central*, 11(2), 218-29. doi: 10.1177/1740774514521904

Coleman, S., Gorecki, C., Nelson, E., Closs, S., Defloor, S., Halfens, R.,…Nixon, J. (2013). Patient risk factors for pressure ulcer development: systematic review. *International Journal of Nursing Studies*, 50(7), 974-1003. doi: 10.1016/j.ijnurstu.2012.11.019

Coleman, S., Nixon, J., Keen, J., Wilson, L., McGinnis, E., Dealey, C.,…Nelson, E. (2014). A new pressure ulcer conceptual framework. *Journal of Advanced Nursing*, 70(10), 2222–2234. doi: 10.1111/jan.12405

Cooper, K. (2013). Evidence-based prevention of pressure ulcers in the intensive care unit. *Critical Care Nurse*, 33(6), 57-66. doi: 10.4037/ccn2013985

Cooper, P. (2006) Assessing erythema to detect the development of pressure ulcers. *Wound Essentials*, 1, 84-86. Retrieved from http://www.wounds-uk.com/pdf/content_9372.pdf

Courey, T., Martsolf, D., Draucker, C., & Strickland, K. (2011). Hildegard peplau's theory and the healthcare encounters of survivors of sexual violence. *Journal of American Psychiatric Nurses Association*, 14(2), 136—143. doi: 10.1177/1078390308315613

Cox, J. (2011). Prediction of pressure ulcers in adult critical care patients. *American Journal of Critical*, 20(5), 364-75. doi: 10.4037/ajcc2011934

Cox, J. (2013). Pressure ulcer development and vasopressor agents in adult critical care patients: a literature review. Ostomy Wound Management, 59(4), 50-60. Retrieved from http://www.o-wm.com/article/pressure-ulcer-development-and-vasopressor-agents-adult-critical-care-patients-literature-re

Cox, J. & Roche, S. (2015). Vasodepressors and development of pressure ulcers in adult critical care patients. *American Journal of Critical Care*, 24(6), 501-510. doi: 10.4037/ajcc2015123

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (Laureate Education, Inc., custom ed.). Thousand Oaks, CA: Sage Publications, Inc.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed). Thousand Oaks, CA: Sage Publications, Inc.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BioMed Central*, 100(2011). **doi:** 10.1186/1471-2288-11-100

Daly, J., Willis, K., Small, R., Green, J., Welch, N, Kealy, M., & Hughes, E. (2007). A hierarchy of evidence assessing qualitative health research. Journal of Clinical Epidemiology, 60(1), 43-9. doi: 10.1016/j.jclinepi.2006.03.014

DeJong, G., Tian, W., Hsieh, C., Junn, C., Karam, C., Ballard, P.,…Backus, D. (2013). Rehospitalization in the first year of traumatic spinal cord injury after discharge from medical rehabilitation. *Archives of Physical Medicine and Rehabilitation*, 94(4), 87-97. doi: 10.1016/j.apmr.2012.10.037

DeJong, G. & Groah, S. (2015). Advancing sci health care to aver rehospitalization. *The Journal of Spinal Cord Medicine*, 38(6), 696-99. doi: 10.1080/10790268.2015.1101917

Devetak, I., Glažar, S., & Vogrinc, J. (2010). The role of qualitative research in science education. *Eurasia Journal of Mathematics, Science & Technology Education*, 6(1), 77-84. Retrieved from http://www.ejmste.com/v6n1/eurasia_v6n1_devetak.pdf

Diaz, S., Li, X., Rodriguez, L., & Salgado, C. (2013). Update in the surgical management of decubitus ulcers. *Anaplastology*, 2(3), 113. doi: 10.4172/2161-1173.1000113

Dietz, V. & Fouad, K. (2013). Restoration of sensorimotor functions after spinal cord injury. *Brain A Journal of Neurology*, 137(3), 654-667. doi: 10.1093/brain/awt262

Duci, S., Arifi, H., Selmani, M., Mekaj, A., Gashi, M., Buja, Z.,…Hoxha, E.(2013). Surgical treatment of 55 patients with pressure ulcers at the department of plastic and reconstructive surgery Kosovo during the period of 200-2010: retrospective study. *Plastic Surgery International*, 2013(129629). doi: 10.1155/2013/129692

Dunton, N., Gajewski, B., Klaus, S., & Pierson, B., (2007). The relationship of nursing workforce characteristics to patient outcomes. *The Online Journal of Issues in Nursing*, 12(3). **doi:** 10.3912/OJIN.Vol12No03Man03

Dworkin, S. (2012). Sample size for qualitiative studies using in-depth interviews. *Archives of Sexual Behavior*, 41(6), 1319-1320. doi: 10.1007/s10508-012-0016-6

Edsberg, L., Black, J., Goldberg, M., & Seiggreen, M. (2016). Revised national pressure ulcer advisory pane pressure injury staging system: revised injury staging system. *Journal of Wound, Ostomy, and Continence Nursing*, 43, 1-13. doi: 10.1097/WON.0000000000000281

Ellen, M., Leon, G., Bouchard, G., Lavis, J., Ouimet, M., & Grimshaw, M. (2013). What supports do health system organizations have in place to facilitate evidence-informed decision-making? a qualitative study. *Implementation Science*, 6(8), 84. doi: 10.1186/1748-5908-8-84

Eslami, V., Saadat, S., Habibi, A., Vaccaro, A., Ghodsi, S., & Rahimi-Movaghar, V. (2012). Factors associated with the development of pressure sores after spinal cord injury. *Spinal Cord*, 50(12), 899-903. **doi:** 10.1038/sc.2012.75

Evans, N., Oreffo, R., Healy, E., Thurner, P., & Man, Y. (2013). Epithelial mechanobiology, skin wound healing, and the stem cell niche. *Journal of the Mechanical Behavior of Biomedical Materials*, 28, 397-409. doi: 10.1016/j.jmbbm.2013.04.023

Fakhry, S., Trask, A., Waller, M., & Watts, D. (2003). Management of brain-injured patients by evidence –based medicine protocol improves outcomes and decreases hospital charges. *The Journal of Trauma Injury, Infection, and Critical Care*, 56(3), 492-9. doi: 10.1097/01.TA.0000115650.07193.66

Fausel, R. & Paski, S. (2014). Autonomin dysreflexia resulting in seizure after colonoscopy in patient with spinal cord injury. *American College of Gastroenterology Case Reports Journal*, 1(4), 187-188. doi: 10.14309/crj.2014.47

Ferrell, B., Coyle, N., & Paice, J. (2015). Oxford textbook of palliative nursing (4th ed). New York, New York. Oxford University Press.

Francke, A. (2008). Factors influencing the implementation of clinical guidelines for healthcare professional. a systematic meta-review, **8(38). doi:** 10.1186/1472-6947-8-38

Frazier Rehab Institute. (2013). *Spinal Cord Medicine Handbook for Patient Family Education.* Retrieved from

http://www.kentuckyonehealth.org/Documents/Frazier/Entire_PF_Handbook_MEB.pdf

Fusch P. & Ness, L. (2015). Are we there yet? data saturation in qualitative research. *The Qualitative Report*, 20(9), 1408-1416. Retrieved from http://www.nova.edu/ssss/QR/QR20/9/fusch1.pdf

Garcia-Fernandez, F., Pancorbo-Hidalgo, P., & Agreda, J. (2014). Predictive capacity of risk assessment scales and clinical judgment for pressure ulcers: a meta-analysis. *Journal of Wound Ostomy Continence Nurses*, 41(1), 24-34. doi: 10.1097/01.WON.0000438014.90734.a2

Gefen, A. (2014). Tissue changes in patients following spinal cord injury and implications for wheelchair cushions and tissue loading: a literature review. *Ostomy Wound Management*, 60(2), 34-45. ISSN 1943-2720. Retrieved from http://www.o-wm.com/article/tissue-changes-patients-following-spinal-cord-injury-and-implications-wheelchair-cushions-an

Ghaisas, S., Pyatak, E., Blanche, E., Blanchard, J., & Clark, F. (2015). Lifestyle changes and pressure ulcer prevention in adults with spinal cord injury in the pressure ulcer prevention study lifestyle intervention. *The American Journal of Occupational Therapy*, 69(1), 1–10. doi: 10.5014/ajot.2015.012021

Ghavam, F., Noorbala, A., & Rahimina, M. (2014). Designing proper dishes for quadriplegic disables. *Archives of Neuroscience*, 1(2), 67-70. doi: 10.5812/archneurosci.12477

Gilbert, G. & Prion, S. (2016). Making sense of methods and measurement: lawshe's context validity index. *Clinical Simulation in Nursing*, 12(12), 530-531. doi: 10.1016/j.ecns.2016.08.002

Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Methods of data collection in qualitative research. *British Dental Journal*, 204(6), 291-295. doi: 10.1038/bdj.2008.192

Gillespie, B., Chaboyer, W., McInnes, E., Kent, B. Whitty, J., & Thalib, L. (2014). Repositioning for pressure ulcer prevention in adults. *The Cochrane Collaboration Journal*, 3(4), CD009958. doi: 10.1002/14651858.CD009958.pub2

Gillespie, B., Chaboyer, W., Sykes, M., O'Brien, J., & Brandis, S. (2014). Development and pilot testing of patient-participatory pressure ulcer prevention care bundle. *Journal of Nurse Care Quality*, 29(1), 74-82. doi: 10.1097/NCQ.0b013e3182a71d43

Glaser, B. & Strauss, A. (2012). The discovery of grounded theory: strategies for qualitative research. London, UK. Transaction Publishers. Retrieved from http://books.google.com/books?hl=en&lr=&id=rtiNK68Xt08C&oi=fnd&pg=PP1&dq=sampling+strategies+in+qualitative+research&ots=UUCZTpWLYL&sig=EJYSU2V0IIIU2oyVBQVi0OzPK60#v=onepage&q=sampling%20strategies%20in%20qualitative%20research&f=false

Goldberg, D. (2014) Implication of fundamental cause theory for priority setting. *American Journal of Public Health*, 104(10), 1830-43. doi: 10.2105/AJPH.2014.302058

Grossman, R., Frankowski, R., Burau, K., Toups, E., Crommett, J., Johnson, M.,…Harrop, J. (2012). Incidence and severity of acute complications after spinal cord injury. *Journal of Neurosurgery: Spine*, 17(l1), 119-128. doi: 10.3171/2012.5.AOSPINE12127

Guihan, M., Bombardier, C. Ehde, D., Rapacki, L., Rogers, T., Bates-Jensen, B.,…Holmes, S. (2014). Comparing multicomponent interventions to improve skin care behaviors and prevent recurrence in veterans hospitalized for severe pressure ulcers. *Archives of Physical Medicine and Rehabilitation*, 95(7), 1246-53. doi: 10.1016/j.apmr.2014.01.012

Gutpa, P., Gutpa, S., & Shyam, R. (2014). Assessment of anxiety in spinal cord injured patients. Indian Journal of Health and Wellbeing. Indian Association of Health, Research, and Wellfare. Hisar, India. **ISSN:** 22295356. Retrieved from http://search.proquest.com/docview/1615263645?accountid=1487

Hammell, K. (2007). Quality of life after spinal cord injury: a meta-synthesis of qualitative findings. *Spinal Cord*, 45(2)**,** 124–139. doi:10.1038/sj.sc.3101992

Harsh, S. (2011). Purposeful sampling a qualitative research synthesis. *Qualitative Research Journal*, 11(2), 63-75. doi: 10.3316/QRJ1102063

Herrmann, K., Kirchberger, I., Biering-sørensen, F., Cieza, A. (2012). Differences in functioning of individuals with tetraplegia and paraplegia according to the international classification of functioning, disability and health icf. *Spinal Cord*, 49(4), 534-43. doi: 10.1038/sc.2010.156

Hess, C. (2012). Checklist for improved wound care outcomes. *Advances in Skin and Wound Care*, 25(3), 122-144. doi: 10.1097/01.ASW.0000412916.19571

Hsieh, J., McIntyre, A., Wolfe, D., Lala, D., Titus, L., Campbell, K., & Teasell, R. (2014). Pressure ulcers following spinal cord injury. *Spinal Cord Injury Rehabilitation Evidence. Version 5.0. 1-90.* Retrieved from https://scireproject.com/evidence/rehabilitation-evidence/pressure-ulcers/

Huston, T., Gassaway, J., Wilson, C., Gordon, S., Koval, J., & Schwebel, A. (2011). Psychology treatment time during inpatient spinal cord injury rehabilitation**.** *Journal of Spinal Cord Medicine***,** 34(2), 196–204. doi: 10.1179/107902611X12971826988219

Hyett, N., Kenney, A, & Dickson-Swift, V. (2014). Methodology or method? a critical review of qualitative case study reports. *International Journal of Qualitative Studies on Health and Well-being*, 9(1). doi: org/10.3402/qhw.v9.23606

Hyun, S., Vermillion, B., Newton, C., Fall, M., Li, X., Kaewprag, P.,…Lenz, E. (2013). Predictive validity of the braden scale for patients in intensive care units. *American Journal of Critical Care*, 22(6), 514-520. doi: 10.4037/ajcc2013991

Ibarra, A., Rios-Hoyo, A., Suarez-Meade, P., Malagón, E., & Colin-Rodríguez, A. (2014). Influence of the level, severity and phase of spinal cord injury on hematological and biochemical *Journal of Trauma and Treatment*, 3(211). doi: 10.4172/2167-1222.1000211

Institute of Medicine. (2013). AE report brief. Retrieved from http://www.nvic.org/PDFs/IOM/NVIC-Stmt-2011-AEFI-Rpt.aspx

Ip, A. & Dicianno, B. (2015). Severe pressure ulcer following an acute depressive episode in a patient with spinal cord injury. *The Human Microbiome. The University of Toronto Medical Journal*, 92(3). Retrieved from http://utmj.org/index.php/UTMJ/article/viewFile/1630/1385

Janesick, V. (2011). *Stretching exercises for qualitative researchers* (3rd edition). Los Angeles, Ca: Sage Publications Inc.

Jensen, M., Truitt, A., Schomer, K., Yorkston, K., Baylor, C., & Moulton, I. (2013). Frequency and age effects of secondary health conditions in individuals with spinal cord injury: a scoping review ***Spinal Cord*****,** 51(12), 882-92. **doi:** 10.1038/sc.2013.112

Jiang, L., Qian, T., Wang, Y., & Zhang, E. (2011). Ischemia-reperfusion injury-induced histological changes affecting early stage pressure ulcer development in a rat model. *Ostomy Wound Management*, 57(2), 55-60. Retrieved from http://www.o-wm.com/content/ischemia-reperfusion-injury-induced-histological-changes-affecting-early-stage-pressure-ulce

Johansen, E., Bakken, L., & Moore Z. (2015). Pressure ulcer in norway-a snapshot of pressure ulcer occurrence across various care sites and recommendations for improved preventive care. *Healthcare*, *3*(2), 417-428; doi: 10.3390/healthcare3020417

Johns Hopkins Medicine. (2011). Pressure ulcers, epidemiology. Retrieved from http://www.hopkinsmedicine.org/geriatric_medicine_gerontology/_downloads/readings/section8.pdf

Johns Hopkins Medicine. (2016a). Wound pressure ulcer management. Retrieved from http://www.hopkinsmedicine.org/gec/series/wound_care.html

Johns Hopkins Medicine. (2016b). Skin anatomy. Retrieved from http://www.hopkinsmedicine.org/neurology_neurosurgery/centers_clinics/cutaneous_nerve_lab/patients/skin_anatomy.html

Johnson, B., Dunlap, E., & Benoit, E. (2010). Structured qualitative research: organizing "mountains of words" for data analysis, both qualitative and quantitative. *National Institutes of Health*, 45(5), 648-670. doi: 10.3109/1082608100394757

Kalogeris, T., Baines, C., Krenz, M., & Korthuis, R. (2012). Cell biology of ischemia/reperfusion injury. *International Review of Cell Molecular Biology*, 298, 229-317. doi: 10.1016/B978-0-12-394309-5.00006-7

Kim, J., Ahn, H., Lyon, D., and Stechmiller, J. (2016). Building a biopsychosocial conceptual framework to explore pressure ulcer pain for hospitalized patients. *Healthcare*, 4(1), 7. doi: 10.3390/healthcare4010007

Kingsley, S. (2014). Braden scale: assessing pressure ulcer risk and assuring appropriate prevention measures. Retrieved from url https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=Braden+scale:+assessing+pressure+ulcer+risk+and+assuring+appropriate+prevention+measures+by+Kingsley,+S.+(2014

Knight, J. (1990). The betty neuman systems model applied to practice: a client with multiple sclerosis. *Journal of Advanced Nursing*, 15(4), 447-455. doi: 10.1111/j.1365-2648.1990.tb01838

Kohta, M., Sakamoto, K., Kawachi, Y., & Oh-I, T. (2015). A single-center, prospective, randomized, open-label, clinical trial of ceramide 2-containing hydrocolloid dressings versus polyurethane film dressins for pressure ulcer prevention in high-risk surgical patients. *Dovepress*, 2015(2), 171-179. doi: 10.2147/CWCMR

Krassioukov, A., Eng, J., Claxton, G., Sakakibara, B., & Shum, S. (2010). Neurogenic bowel management after spinal cord injury: a systematic review of the evidence. *Spinal Cord*, 48(10), 718-733. doi: 10.1038/sc.2010.14

Krupp, A. & Monfre, J. (2015). Pressure ulcers in the icu patient: an update on prevention and treatment. *Current Infectious Disease Reports*, 17(3), 468. doi: 10.1007/s11908-015-0468-7

Kryczka, T. & Grieb, P. (2014). Supportive treatment of pressure ulcers with dietary supplementation. *Clinical Pharmacology & Biopharmaceutics*, 4(1). doi. 10.4172/2167-065X.1000130

Lacouture, A., Breton, E., Guichard, A., & Ridde, V. (2015). The concept of mechanism from a realist approach: a scoping review to facilitate its operationalization in public health program evaluation. *Implementation Science*, 10(153). doi: 10.1186/s13012-015-0345-7

Lang, T., Hodge, M. Olson, V. Romano, P., & Kravitz, R. (2004). Nurse patient ratios. *Journal of Nursing Administration*. 2004 Jul-Aug: 34(7-8):326-37. Retrieved

from http://www.ncbi.nlm.nih.gov/pubmed/15303051Latimer, S., Chaboyer, W., & Gillespie, B. (2014). Patient participation in pressure injury prevention: giving a patients voice. *Scandinavian Journal of Caring Sciences*, 28(4), 648-56, doi: 10.1111/scs.12088

Latimer, S., Chaboyer, W., & Gillespie, B. (2015). The repositioning of hospitalized patients with reduced mobility: a prospective study. *Nursing Open*, 2(2), 95-93. doi: 10.1002/nop2.20

Lawshe, C. (1975). A quantitative approach to content validity. *Personnel Psychology*, 28, 563-575. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.460.9380&rep=rep1&type=pdf

Lin, H. (2015). Why we need to revise the definition and diagnostic criteria for sepsis. *Chinese Journal of Traumatology*, 18(5), 249-250. doi:10.1016/j.cjtee.2015.11.009

Linder-ganz, E., Yarnitzky, G., Yizhar, Z., Siev-ner, I., & Gefen, A. (2009). Real-time finite element monitoring of sub-dermal tissue stresses in individuals with spinal cord injury: toward prevention of pressure ulcers. *Annals of Biomedical Engineering,* 37(2), 387-400. doi: 10.1007/s10439-008-9607-8

Linsenmeyer, T., Bodner, D., Creasey, G., Green, B., Groah, S., Joseph, A.,…Wheeler, J. (2006). Bladder management for adults with spinal cord injury. *Journal of Spinal Cord Medicine*, 29(5) 527–573. PMC1949036. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1949036/

Loyola University Chicago. (1996). Reticular dermis. Loyola University Medical Education Network. Retrieved from http://www.meddean.luc.edu/lumen/meded/medicine/dermatology/melton/skinlsn/retderm.htm

Luborsky, M. & Rubinstein, R. (1995). Sampling in qualitative research. *HHS Public Access*, 17(1), 89–113. doi: 10.1177/0164027595171005

Lucero, R., Lake, E., & Aiken, L. (2010). Nursing care quality and AE in u s hospitals. *Journal of Clinical Nursing*, 19(15-16), 2185-2195. doi: 10.1111/j.1365-2702.2010.03250.x

Madden, M. (2015). Providing patient-centered pressure ulcer care. Nursing in Practice. 2015 Aug: 85. ISSN 1473-9445. Retrieved from http://www.nursinginpractice.com/article/providing-patient-centered-pressure-ulcer-care

Mansfield, K, Meyer, K, Ugiliweneza, B, Kong, M, & Nosova, K. (2014). Traumatic spinal cord injury with concomitant brain injury: in-hospital complication rates and resource utilization. *JSM Neurosurg Spine*, 2(2), 1017. Retrieved from http://www.jscimedcentral.com/Neurosurgery/neurosurgery-2-1017.pdf

Marin, J., Nixon, J., & Gorecki, C. (2013). A systematic review of risk factors for the development and recurrence of pressure ulcers in people with spinal cord injuries. *Spinal Cord*, 51(7), 522-527. doi: 10.1038/sc 2013.29

Martz, E., Gontkovsky S., Stokic, D., & Livneh, H. (2010). Psychosocial responses to spinal cord injury as predictors of pressure sores. *International Journal of Clinical*

and Health Psychology, 10(2), 203-223. ISSN 1697-2600. Retrieved from http://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1008&context=coun_fac

Mason, M. (2010). Sample size and saturation in phd studies using qualitative interviews. *Forum: Qualitative Social Research*, 11(3), art. 8. Retrieved from http://www.qualitative-research.net/index.php/fqs/article/view/1428/3027

Maxwell, J. (2013). *Qualitative research design an interactive approach*. Los Angeles, Ca: Sage Publications Inc.

Mayne, J. (2008). Contribution analysis: an approach to exploring cause and effect. The Institutional Learning and Change Initiative. Retrieved from http://www.cgiar-ilac.org/files/ILAC_Brief16_Contribution_Analysis_0.pdf

Mayo Clinic. (2016). Diseases and conditions spinal cord injury. Retrieved from http://www.mayoclinic.org/diseases-conditions/spinal-cord-injury/basics/definition/con-20023837

McCormack, B., Rycroft-Malone, J., Decorby, K., Hutchinson, A., Bucknall, T., Kent, B.,…Wilson, V. (2013). A realist review of interventions and strategies to promote evidence-based healthcare: a focus on change agency. *Implementation Science*, 8(107). doi: 10.1186/1748-5908-8-107

McGinnis, E., Briggs, M., Collinson, M., Wilson, L., Dealey, C., Brown, J.,…Nixon, J. (2014). Pressure ulcer related pain in community populations: a prevalence survey. *British Medical Journal*, **13(**16). doi: 10.1186/1472-6955-13-16

McInnes, E., Chaboyer, W., Murray, E., Allen, T., & Jones, P. (2014). The role of

patients in pressure injury prevention: a survey of acute care patients. BMC Nursing, 13(41). doi: 10.1186/s12912-014-0041-y

Meleis, A. (2010). Transitions Theory: Middle Range and Situation Specific Theories in Nursing. New York, New York: Springer Publishing Company.

Mero-Jaffe, I. (2011). 'Is that what I said' Interview transcript approval by participants: An aspect of ethics in qualitative research. International Journal of Qualitative Methods, 10(3), 231-247. doi: 10.1177/160940691101000304

Middendorp, J., Goss, B. Urquhart, S., Atresh, S., Williams, R., & Schuetz, M. (2011). Diagnosis and prognosis of traumatic spinal cord injury. *Global Spine Journal*, 1(1), 1-8. doi: 10.1055/s-0031-1296049

Miles, M., Huberman, M., & Saldana, J. (2014). *Qualitative data analysis: a methods sourcebook*. (3rd ed.). Los Angeles, CA: Sage Publications.

Miura, H., Ito, Y., Matsuda, T., Abe, A., & Kitaba, S. (2013). Negative pressure wound therapy with multiple drainage holes for the treatment of pressure ulcer with undermining: case reports. *Journal of Cosmetics, Dermatological Sciences and Applications*, 3, 107-109. doi: 10.4236/jcdsa.2013.31015

Munce, S., Webster, F., Fehlings, M., Straus, S., Jang, E., & Jaglal, S. (2014). Perceived facilitators and barriers to self-management in individuals with traumatic spinal cord injury: a qualitative descriptive study. *Medical Sciences—Psychology and Neurology*, 14(48). doi: 10.1186/1471-2377-14-48

Naicker, A., Roohi, S., & Chan, J. (2009). Botulinum toxin type A for rehabilitation after spinalcord injury: a case reprort. *Journal of Orthopaedic Surgery*, 17(1), 96-9. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/19398803

Nakamura, Y., Ghaibeh, A., Setoguchi, Y. Mitani, Y., Abe, Y., Hashimoto, I., & Moriguchi, H. (2015). On-admission pressure ulcer prediction using the nursing needs score. *Journal of Medical Internet Research*, 3(1), e8. doi: 10.2196/medinform.3850

National Pressure Ulcer Advisory Panel. (2009). *International guideline pressure ulcer treatment technical report*. National Pressure Ulcer Advisory Panel and European Pressure Ulcer Advisory Panel Publishers. Retrieved from http://www.npuap.org/wp-content/uploads/2012/03/Final-2009-Treatment-Technical-Report1.pdf

National Pressure Ulcer Advisory Panel. (2014a). The NPUAP pressure ulcer stages/categories. Retrieved from http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-ulcer-stagescategories/

National Pressure Ulcer Advisory Panel. (2014b). The NPUAP selected “quality of care regulations” made easy. Retrieved from http://www.npuap.org/wp-content/uploads/2014/03/NPUAP-F-tag-final-March-2014.pdf

NVivo. (2016). NVivo tutorial. Youtube. Retrieved from http://www.youtube.com/watch?v=oelXFnJ-7Ms

Olsho, L., Spector, W., Williams, C., Rhodes, W., Fink, R., Limcangco, R., & Hurd, D. (2014). Evaluation of ahrq’s on-time pressure ulcer prevention program: a

facilitator-assisted clinical decision support intervention for nursing homes. *Medical Care*, 52(3), 258-66. *doi:* 10.1097/MLR.0000000000000080

O'Rahilly, R., Muller, F., Carpenter, S., & Swenson R. (2012). The layers of skin. *Basic Human Anatomy*. Dartmouth Medical School. Hanover, N.H. Retrieved from https://www.dartmouth.edu/~humananatomy/part_1/chapter_4.html

Page, R., Samson, Y., & Crockett, M. (2000). *Reporting ethnography to informants*. In Brizuela, B., Stewart, J., Carrillo, R., & Berger, J. (Eds.), *Acts of inquiry* (pp. 321–352) Reprint Series, 34. Cambridge: Harvard Educational Review.

Pannek, J., Gocking, K., & Bersch, U. (2010). Sacral rhitzotomy: a salvage procedure in a patient with autonomic dysreflexia. *Spinal Cord*, 48(4), 347-8. **doi:**10.1038/sc.2009.120

Park-Lee, E. & Caffrey, C. (2009). Pressure ulcers among nursing home residents. Centers for Disease Contol and Prevention. NCHS Data Brief. Retrieved from http://www.cdc.gov/nchs/data/databriefs/db14.htm

Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Paul, R., McCutcheon, S., Tregarthen, J., Denend, L., & Zenios, S. (2014). Sustaining pressure ulcer best practices in a high volume cardiac care environment. *American Journal of Nursing*, 114(8), 34-44. doi: 10.1097/01.NAJ.0000453041.16371.16

Pawson R. & Tilley N. (2004). *Realist evaluation*. London. Sage Publications. Retrieved from http://www.communitymatters.com.au/RE_chapter.pdf

Peplau, H. (1997). Peplau's theory of interpersonal relations. *Nursing Science Quarterly*, 10(4), 4162-167. doi: 10.1177/089431849701000407

Peterson, M., Gravenstein, N., Schwab, W., Oostrom, J., & Caruso, L. (2013). Patient repositioning and pressure ulcer risk—monitoring interface pressures of at risk patients. *Journal of Rehabilitation Research & Development*, 50(4), 477-488. doi: 10.1682/JRRD.2012.03.0040

Pickham, D., Pihulic, M., Valdez, A., Mayer, B., Duhon, P., & Larson, B. (2018). Pressure injury prevention practices in the intensive care unit: Real-world data captured by a wearable patient s enosr. Wounds, 154(5), 621-628. ISSN: 1943-2704

Pinkney, L. (2014). Why do patients develop severe pressure ulcers? A retrospective case study. British Medical Journal, 4(1), e004303. doi: 10.1136/bmjopen-2013-004303

Pittaccio, S., Garavaglia, L., Viscuso, S., Beretta, E., & Strazzer, S. (2013). Implementation, testing, and pilot clinical evaluation of superelastic splints that decrease joint stiffness. *Annals of Biomedical Engineering*. Springer Science and Business Media. New York, New York. **doi:** http://dx.doi.org/10.1007/s10439-013-0848-9

Polit, D. & Beck, C. (2007). *Nursing research: Generating and assessing evidence for nursing practice*. Philadelphia: Lippincott Williams & Wilkins.

Powell & Renner (2003). Analyzing qualitative data. Program Development and Evaluation. The University of Wisconsin. Retrieved from http://learningstore.uwex.edu/assets/pdfs/g3658-12.pdf

Qaseem, A., Tanveer, P., Starkey, M., & Denberg, T. (2015). Risk assessment and prevention of pressure ulcers: a clinical practice guideline from the american college of physicians. *Annals of Internal Medicine*, 162(5), 359-369. doi: 10.7326/M14-1567

Rafter, N., Hickey, A., Condell, S., Conroy, R., O'Connor, P., Vaughan, D., & Williams, D. (2015). AE in healthcare: learning from mistakes. *QJM:An International Journal of Medicine*, 108(5), 355-359. doi: 10.1093/qjmed/hcu145

Raingruber, B., Teleten, O., Curry, H., Vang-Yang, B., Kuzmenko, L., Marquez, V., & Hill, J. (2010). Improving nurse patient communication and quality of care. the transcultural linguistic care team. *The Journal of Nursing Administration*, 40(6), 258-60. doi: 10.1097/NNA.0b013e3181df0f69.

Rathore, F. & Mansoor, S. (2012). Factors associated with the development of pressure ulcers after spinal cord injury. *Spinal Cord*, 51(1). doi: 10.1038/sc.2012.118

Roy, S. (2012). Papillary dermis. *Integumentary System*. Retrieved from http://www.knowyourbody.net/papillary-dermis.html

Rubayi, S., (2015). *Reconstructive plastic surgery for pressure ulcers* (2015th edition). New York, New York. Springer Publishing Company.

Rudestam, K. E., & Newton, R. R. (2015). *Surviving your dissertation: A comprehensive guide to content and process.* (4th ed.). Thousand Oaks, CA: Sage Publications.

Rycroft-Malone, J., Burton, C., Williams, L., & Williams, R. (2015). Improving skills and care standards for the support workforce in health and social care services for older people: a realist synthesis of evidence. The National Institute of Health Grant No. 12/129/32. Retrieved from https://www.researchgate.net/publication/281964716_Improving_skills_and_care_standards_in_the_support_workforce_a_realist_synthesis_of_workforce_development_interventions

Rycroft-Malone, J., McCormack, B., Hutchinson, A., DeCorby, K., Bucknall, T., Kent, B.,…Wilson, V. (2012). Realist synthesis: illustrating the method for implementation research. *Implementation Science*, 7(33). doi: 10.1186/1748-5908-7-33

Rycroft-Malone, J., Fontenla, M., Bick, D., & Seers, K. (2007). *Protocol-based care evaluation project. report for the national coordinating centre for nhs servive delivery and organization*. London. *Queens Printer and Controller of HMSO*. Retrieved from http://www.amcp.org/WorkArea/DownloadAsset.aspx?id=12507

Rycroft-Malone, J., Fontenla, M., Bick, D., & Seers, K. (2010). A realistic evaluation: the case of protocol-based care. *Implementation Science*, **5(**38). doi: 10.1186/1748-5908-5-38

Rycroft-Malone, J., Fontenla, M., Seers, K., & Bick, D. (2009). Protocol-based care: standardisation of decision-making. *Journal of Clinical Nursing*, 18(10), 1490-500. doi: 10.1111/j.1365-2702.2008.02605.x

Sailor, A., White, A., Boldt, C., Post, M., & Lay, V. (2013). Prevalence, location, grade of pressure sores and association with specific patient characteristic in adult spinal cord injury patients during the hospital stay: a perspective cohort study. *Spinal Cord*, 51, 828-833. doi: http://dx.doi.org/10.1038/sc.2013.91

Sanjari, M., Bahramnezhad, F., Fomani, F., Shogi, M., & Cheraghi, M. (2014). Ethical challenges of researchers in qualitative studies: the necessity to develop a specific guideline. *The Journal of Medical Ethics and History of Medicine*, 7(14). Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4263394/

Schiffman, J., Golinko, M., Yan, A., Flattau, A., Tomic-Canic, M., & Brem, H. (2009). Operative debridement of pressure ulcers. *World Journal of Surgery*, 33, 1296-1402. doi: 10.1007/s00268-009-0024-4

Schofield, R., Porter-Armstrong, A., & Stinson, M. (2012). Reviewing the literature on the effectiveness of pressure relieving movements. *Nursing Research and Practice*, 2013. doi: 10.1155/2013/124095

Scovil, C., Flett, H., McMillan, I., Delparte, J., Leber, D., Brown, J., & Burns, A. (2014). The application of implementation science for pressure ulcer prevention best practices in an inpatient spinal cord injury rehabilitation program. *Journal of Spinal Cord Medicine*, 37(5), 589-597. doi: 10.1179/2045772314Y.0000000247

Senthikumaran, S., Balamurgan, N., Karthikeyan, V., & Thirumalaikolundusubramanian, P. (2010). Eschar – a forgotten focus of concern. *Journal of Global Infectious Diseases*, 2(2), 195–196. doi: 10.4103/0974-777X.62867

Sezer, N., Akkus, S., & Uğurlu, F. (2015). Chronic complications of spinal cord injury. *World Journal of Orthopedics*, 6(1), 24-33. doi: 10.5312/wjo.v6.i1.24

Sharp, C. & McLaws, M. (2005). A discourse on pressure ulcer physiology: the implications of repositioning and staging. *World Wide Wounds*. Retrieved from http://www.worldwidewounds.com/2005/october/Sharp/Discourse-On-Pressure-Ulcer-Physiology.html

Silver, J. & Weiner, M. (2012). George riddoch: the man who found ludwig guttmann. *Spinal Cord*, 50, 482. doi: 10.1038/sc.2011.179

Simpson, L., Eng, J., Hsieh, J., & Wolfe, D. (2012). The health and life priorities of individuals with spinal cord injury: a systematic review. *Journal of Neurotrauma*, 29(8). doi: 10.1089/neu.2011.2226

Singer, M., Deutschman, C., Seymour, C., Shankar-Hari, M., Annane, D., Bauer, M.,…Angus, D. (2016). The third international consensus definitions for sepsis and septic shock (sepsis-3). *The Journal of the American Medical Association*, 315(8). doi: 10.1001/jama.2016.0287

Smith, M., Totten, A., Hickam, D., Fu, R., Wasson, N., Rahman, B.,…Saha, S. (2013). Pressure ulcer treatment strategies: a systematic comparative effectiveness review. *Annals of Internal Medicine*, 159(1), 39-50. doi: 10.7326/0003-4819-159-1-201307020-00007

Soban, L.. Hempel, S., Munjas, B., Miles, J., and Rubenstein, L. (2011). Preventing Pressure Ulcers in Hospitals: A Systematic Review of Nurse-Focused Quality Improvement Interventions. *The Joint Commission Journal on Quality and*

Patient Safety, 37(6), 245-52. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK81724/

Stansby, G., Avital, L., Jones, K., & Marsden, G. (2014). Prevention and management of pressure ulcers in primary and secondary care: summary of nice guidance. *British Medical Journal*, 348. doi: 10.1136/bmj.g2592

Stetler, C., Ritchie, J., Rycoft-Malone, J., Schultz, A., & Charns, M. (2009). Institutionalizing evidence –based practice: an organizational case study using a model of strategic change. *Implementation Science*, 4(78). doi: 10.1186/1748-5908-4-78

Sullivan, N. (2013). *Making Health Care Safer II: An Updated Critical Analysis of the Evidence for Patient Safety Practices*. Agency for Healthcare Research and Quality, Publisher. Retrieved from http://www.ncbi.nlm.nih.gov/books/NBK133388/

Talsma, A., Tschsannen, D., Guo, Y., & Kazemi, J. (2011). Evaluation of pressure ulcer prevention clinical decision report for bedside nurses in acute hospitals. *Applied Clinical Informatics*, 2(4), 508-521. doi: 10.4338/ACI-2011-07-RA-0046

Tator, C. & Fehlings, M. (1991). Review of secondary injury theory of acute spinal cord trauma with emphasis on vascular mechanisms. *Journal of Neurosurgery*, 75(1), 15-26. doi: 10.3171/jns.1991.75.1.0015

Thom, C., Smith, M., Aziz, O., & Holme, T. (2013). The waterlow score for risk assessment in surgical patients. *Annals of Royal College of Surgeons of England*, 95(1), 52-56. doi: 10.1308/003588413X13511609954770

Thomas, D. & Compton, G. (2014). *Pressure ulcers in an aging population: A guide for clinicians*. New York, New York. Springer Science and Business Media Publishers.

Torra i Bou, J., Garcia-Fernandez, F., Pancorbo-Hidalgo, P., & Furtado, K. (2006). Risk assessment scales for predicting the risk of developing pressure ulcers. *Science and Practice of Pressure Management.* London, Springer Publications. p. 43-51. doi*:* 10.1007/1-84628-134-2_6

Tufford, L. & Newman, P. (2010). Bracketing in qualitative research. *Qualitative Social Work*. Sage Publications, 11(1), 80-96. doi: 10.1177/1473325010368316

Tung, J., Stead, B., Mann, W., Pham, B., & Popovic, M. (2015). Assistive technologies for self-managed pressure ulcer prevention in spinal cord injury: a scoping review. *Journal of Rehabilitation Research & Development*, 52(2), 131-146. doi: 10.1682/JRRD.2014.02.0064

United Spinal Association. (2016). Spinal cord resource center. skin breakdown, pressure ulcer prevention with sci-rrtc. Retrieved from http://www.spinalcord.org/resource-center/askus/index.php?pg=kb.page&id=2396

University of Virginia Health System (2017). Hospital-Acquired Pressure Ulcers (HAPU). Retrieved from: https://uvahealth.com/about/quality-safety/hospital-acquired-pressure-ulcers-hapu

University of Washington. (2016). Northwest regional spinal cord injury system. University of Washington School of Medicine. Rehabilitation Medicine. Retrieved from http://sci.washington.edu/info/pamphlets/msktc-skin1.asp

US Food and Drug Administration. (2014). CFR- code of regulations title 21. AE. Retrieved from http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm?fr=312.32

Valensuela-Silva, C., Tuero-Iglesias, A., Garcia-Iglesias, E., Gonzalez-Diaz, O., Del Rio-Martin, A., Yera Alos, I.,…LopezSaura, P. (2013). Granulation response and partial wound closure predict healing in clinical trials on advanced diabetes foot ulcers treated with recombinant human epidermal growth. *Diabetes Care*, 36(2), 210-215. doi: 10.2337/dc12-1323

Wake, W. (2010). Pressure ulcers: what clinicians need to know. *The Premanente Journal*, 14(2), 56-60. doi: 10.7812/TPP/09-117

Walker, D. & Myrick, F. (2006). Grounded theory: an explanation of process and procedure. *Qualitative Health Research*, 16(4), 547-59. doi: 10.1177/1049732305285972

Warner-Maron, I. (2015). The risk of risk assessment: pressure ulcer assessment and the braden scale. *Annals of Long-Term Care*, 23(5). Retrieved from http://www.annalsoflongtermcare.com/article/risk-risk-assessment-pressure-ulcer-assessment-and-braden-scale

Westie, K. (1999). Psychological aspects of spinal cord injury. *Clinical Prosthetics and Orthotics*, 11(4), 225-229. Retrieved from http://www.oandplibrary.org/cpo/pdf/1987_04_225.pdf

Wound, Ostomy, and Continence Nurses Society (WOCN), 2016. Guideline for prevention and management of pressure ulcers (injuries). *Wound, Ostomy, and Continence Nurses Society*, 44(3), 241-46. doi: https: 10.1097/WON.0 0000000000000321

Wound Source. (2014). Identifying types of tissue found in pressure ulcers. *Wound Source*. Retrieved from http://www.woundsource.com/blog/identifying-types-tissues-found-pressure-ulcers

World Health Organization (WHO). (2013). International perspectives on spinal cord injury. Retrieved from http://apps.who.int/iris/bitstream/10665/94190/1/9789241564663_eng.pdf

Yang, R., Guo, L., Wang, P., Huang, Y., Wang, W., Chen, K.,…Shen, H. (2014). Epidemiology of spinal cord injuries and risk factors for complete injuries in guangdong, china: a retrospective study. *PLOS One*, 9(1), e84733. doi: 10.1371/journal.pone.0084733

Zabrasek, E., Creasey, G., & Crew, J. (2015). Pressure ulcers in people with spinal cord injury in developing nations. *Spinal Cord*, 53**,** 7–13. doi:10.1038/sc.2014.179

Zarathiewicz, S., Whitney, J., Lowe, J., Taylor, S., O'Donnell, F., & Minton-Foltz, P. (2011). Development and implementation of a hospital-acquired pressure ulcer

incidence tracking system and algorithm. *Journal of Healthcare Quality,* 32(6), 44–51. doi: 10.1111/j.1945-1474.2010.00076.x

Zeller, J., Lynn, C., & Glass, R. (2006). Pressure ulcers: patient page. *The Journal of the American Medical Association,* 296(8), 20-23 doi:10.1001/jama.296.8.1020

Zhang, V., Guan, Z., Reader, B., Shawler, T., Mandrekar-Colucci, S., Huang, K.,…Popovich, P. (2013). Autonomic dysreflexia causes chronic immune suppression after spinal cord injury. *Journal of Neuroscience*, 33(32), 12970-12981. doi: 10.1523/JNEUROSCI.1974-13.2013

Appendix A: QI Interview Questions

Interview time:

Interviewee:

Location of Interviewee:

Interviewer: Carle Ray

Interview Questions

All participants are quadriplegic individuals.

1. Have you been admitted to an emergency room or facility within the last 5 years for any reason? If so, when did the admittance occur?

Follow up question: Have you ever been admitted to an emergency room or facility at any time for any reason since your initial injury and rehabilitation?

Follow up question: Did the staff assess your pressure ulcer susceptibility upon admittance?

Follow up question: If you were aware of these circumstances, can you describe the detail used by the staff for pressure ulcer assessment, and the factors that were assessed?

2. Can you please describe the circumstances of this acute care event?

Follow up question: Where you transported by ambulance or in your own vehicle?

Follow up question: If you were transported in an ambulance where the EMT's aware of your condition? Did the EMT's try to protect you from skin problems, and how did they accomplish the protection?

Follow up question: Were you placed on a stretcher, gurney, or regular hospital bed for any period of time in the emergency room?

Follow up question: Were you placed in the ICU at any time during your stay?

Follow up question: Were you able to influence the decisions made by the staff about your bed? **Follow up question**: What was the process for your inclusion in decisions as a patient related to your personal care and pressure ulcer prevention?

Follow up question: If you were excluded from this process, can you please describe your observations or experience of care that was provided?

3. Can you describe the pressure ulcer prevention guidelines as you understand them?

Follow up question: From your perspective, did the staff practice good pressure ulcer prevention technique by following the guidelines as you understand them, and can you give an example of the these techniques that were used?

Follow up question: If you were placed in the ICU during your stay, were you aware of your surroundings? Were you on a Respirator? Did the staff actively attempt to protect your skin? Did the ICU staff allow you to influence the repositioning and pressure ulcer prevention technique, and can you describe details of your input?

Follow up question: If you were denied the ability to influence your care, can you describe the details of the staff decisions on this issue?

4. Can you describe how often you were repositioned during your stay in the acute care setting or ICU and the procedure staff used?

Follow up question: If you had not been able to talk to the staff, how do think repositioning would have been handled?

Follow up question: Were you propped up with pillows by staff to alleviate pressure after turns from specific areas of your body?

Follow up question: Do you think you would have been left alone for long periods of time? Do you think you would have been left for periods longer than 2 hrs?

5. If you were you on a regular hospital bed, from your perspective and personal routines as a quadriplegic individual, can you explain why it was deemed necessary or acceptable by facility staff?

Follow up question: Do you think there were other options, and can you describe these options?

Follow up question: Were you offered an air mattress of any kind? Did you request an air mattress suitable for your condition, and what was the outcome of your request?

6. From your perspective, can you confirm with an example that proper pressure ulcer prevention guidelines were followed during the admittance*?*

Follow up question: From your perspective can you explain in detail how the staff could have executed the pressure ulcer prevention guidelines better?

7. Did you have any personal assistance such as a personal care giver or family member to assist you during the stay in the acute care setting, and can you please describe the scope of this assistance?

Follow up question: Did the acute care facility agree/ disagree with help from your personal assistant?

Follow up question: Did you try to convince the facility of merits of getting help from your personal assistant, and can you describe to the best of your recollection what you said to the staff and how the facility responded to your logic in this matter?

8. Did any facility staff member discuss repositioning, pressure ulcer prevention guidelines, or pressure ulcers with you at any time during your stay or ask your personal opinion, knowing that you are a vulnerable individual and that you have valuable knowledge about your personal care and pressure ulcer prevention, and can you relate in detail how they approached the subject?

9. Did you at any time during your stay in a facility bring up concerns about repositioning, pressure ulcer prevention guidelines, or pressure ulcer development to the attention of acute care staff based on your concerns as a quadriplegic or needs you recognized were unfulfilled, and can you give an example of your inquiry?

Follow up question: What was the staff member's reaction and input following your concern about pressure ulcers or prevention guidelines?

Follow up question: What was the staff member's input for solutions, and can you describe how the staff member answered to your concerns?

Follow up question: From your perspective, what may have been some circumstances or factors that would have kept staff from providing proper repositioning or pressure ulcer prevention guidelines based on your situation at the time?

Follow up question: If you think repositioning failures occurred, what could have been done better by the acute care facility or staff in your opinion?

Follow up question: Were your wishes fulfilled after discussion with staff members, and can you relate what was done or what changed after discussing your personal care?

Follow up question: Do you think the facility had adequate staff to address your personal needs based on your condition as a quadriplegic?

Follow up question: How would you describe the customer service at the facility?

10. What do you believe could be done in general to improve repositioning or pressure ulcer prevention by emergency room or facility staff for quadriplegic individuals?

11. Can you confirm that a pressure ulcer developed during your admittance to an acute care facility or shortly afterward, and can you relate in detail the reasons from your perspective that may have caused your new pressure ulcer?

Follow up question: Can you relate how the pressure ulcer may have been directly related to repositioning offered by the staff of the facility?

Follow up question: Can you relate reasons other than repositioning that may have caused their new pressure ulcer?

Follow up question: Can you relate the probability that you could have developed a pressure ulcer from events in the ER, and can you explain if your inability to communicate to the staff at the time may have affected this process?

12. Have you ever been hospitalized specifically for a pressure ulcer unrelated to an acute care setting, and can you detail this event?

13. Have you ever had surgery to repair the effects of a pressure ulcer, and can you describe in detail how you believe this pressure ulcer developed, and provide the length of time you were affected by the wound?

Follow up question: Can you describe the methods of wound care you used before you and your physician decided on surgery to repair your wound?

14. Have you had a personal history of pressure ulcers, and can you ascertain the cause of these pressure ulcers with as much detail as possible including approximate dates and general cause?

Follow up question: How long did it take you to overcome the pressure ulcer/ ulcers*?*

Follow up question: What stage did the pressure ulcer or pressure ulcers become?

Follow up question: Did you have to stay in bed to recover?

15. Based on personal experience, what do you think are the best pressure ulcer prevention guidelines?

Follow up question: How do these procedures compare to the facility guidelines you experienced?

16. During your experience in an acute care setting, were you ever told you had any red or discolored skin or any unblanchable red areas?

Follow up question: Did staff describe adequate procedures in your perspective, considering the redness may be a Stage I pressure ulcer?

Follow up question: What procedure did the staff follow from the first knowledge of a red area?

Follow up question: Were you consulted on this issue and allowed to provide input for treatment, and what was your input?

Follow up question: Was a wound specialist brought in for consultation?

Follow up question: What would you do if your care provider told you about a red or discolored area of skin or an unblanchable red area?

17. Can you please describe the outcome of your personal experience in the acute care setting?

Appendix B: Interview Questions for Clinicians

Interview time:

Interviewee:

Interviewee occupation:

Interviewee acute care department:

Location of Interviewee:

Interviewer: Carle Ray

Interview Questions

All participants are acute care clinicians.

1. Can you describe your knowledge of pressure ulcer prevention guidelines?

2. Can you please describe any specific education you have had related to pressure ulcer prevention or care including the number of hours of training?

3. Can you describe your knowledge of the condition of quadriplegia?

Follow up question: Have you ever given care to a quadriplegic individual?

Follow up question: Can you describe the specific circumstances of this event/ events?

4. Can you describe how you would assess a patient for pressure ulcers?

Follow up question: If you would use a pressure ulcer assessment tool, can you name the tool and describe it in detail?

5. How would you describe a Stage I pressure ulcer?

Follow up question: What steps would you take to assure proper care for an individual with a potential Stage I pressure ulcer?

6. During your experience in an acute care setting, have you ever discovered any red or discolored skin or any unblanchable red areas on a patient?

Follow up question: Can you describe the specific circumstances of this event/ events?

Follow up question: Can you describe what action or non-action you took after the discovery?

7. Can you describe the difference in pressure ulcer prevention guidelines for the condition of quadriplegia and other severe disabilities or elderly individuals?

8. Faced with a serious condition like quadriplegia for care, describe how you would or would not include the quadriplegic individual in his/her own care?

Follow up question: Describe the level of input a quadriplegic's personal care provider or family member might be able to care for this individual in your present or former acute care setting?

Follow up question: If you were in charge, how would approach a situation involving input about personal care from a quadriplegic individual?

Follow up question: Can you relay a situation or situations where personal input about care by any patient was denied or unable to be fulfilled?

9. If you witnessed execution of improper pressure ulcer prevention guidelines in your department, how would address this situation?

10. What specifically do you believe can be done in your acute care facility to improve pressure ulcer prevention?

11. Do you believe a quadriplegic individual would be treated differently in an emergency room setting than in a regular hospital room situation?

Follow up question: Can you please describe the difference in these two circumstances?

12. Do you believe a quadriplegic individual would be treated differently in an intensive care setting than in a regular hospital room situation, and can you please describe the difference in these two circumstances?

13. Can you describe any circumstances that you were directly involved with a pressure ulcer, or a situation you witnessed as a bystander?

Follow up question: Can you please give the details of each circumstance?

Follow up question: Can you please give details of the diagnosis, prognosis, and treatment in each situation?

Follow up question: Can you please give the outcome for each situation to the best of your knowledge?

Appendix C: Interview Questions for QI Care Providers/ Family Members

Interview time:

Interviewee:

Location of Interviewee:

Interviewer: Carle Ray

Interview Questions

All participants are QI Care Providers or Family Members.

1. Has your quadriplegic patient or family member been admitted to an emergency room or facility within the last 5 years for any reason? If so, when did the admittance occur?

Follow up question: Has this individual ever been admitted to an emergency room or facility at any time for any reason since their initial injury and rehabilitation?

Follow up question: Did the staff assess them for pressure ulcer susceptibility upon admittance?

Follow up question: If you were aware of these circumstances, can you describe the detail used by the staff for pressure ulcer assessment, and the factors that were assessed?

2. Can you please describe the circumstances of this acute care event?

Follow up question: Where they transported by ambulance or in their own vehicle?

Follow up question: If they were transported in an ambulance, did you ride along and were the EMT's aware of the patient's condition?

Follow up question: Can you describe any steps the EMT's used to try and protect the patient from skin problems during the trip?

Follow up question: Was the patient placed on a stretcher, gurney, or regular hospital bed for any period of time in the emergency room, and can you describe the length of time to the best of your knowledge?

Follow up question: Was the patient placed in the ICU at any time during their stay?

Follow up question: Can you describe in detail if you were able to influence the decisions made by the staff about the patient's bed?

Follow up question: Did you ask to be included in the patient's care in the ER and can you relate detail of the process for your inclusion in these decisions or activities?

Follow up question: If you were excluded from this process, can you please describe your observations or experience of the acute care provided and all circumstances surrounding the provision of care by staff?

3. Can you describe the pressure ulcer prevention guidelines as you understand them?

Follow up question: From your perspective, did the staff in the above situation practice good pressure ulcer prevention technique by following the guidelines as you understand them, and can you give an example of these techniques the acute care staff used?

Follow up question: If the patient was placed in the ICU during their stay, were they aware of their surroundings? Were they on a Respirator? Did the staff actively attempt to protect the patient's skin?

Follow up question: Were you allowed to provide any care for the quadriplegic individual related to repositioning and pressure ulcer prevention, and can you describe the details of the care you provided and the communication between you as a care provider or family member with the acute care facility in question to coordinate the care?
Follow up question: If you were denied the ability to care for the quadriplegic individual, can you describe the details of the staff decisions in detail?

4. Can you describe how often the quadriplegic individual was repositioned during their stay in the acute care setting or ICU and the procedure staff used?
Follow up question: If you had not been able to assist the staff, how do think repositioning would have been handled?
Follow up question: Was the patient propped up with pillows by staff to alleviate pressure from specific areas of your body, and what are the details of the procedure?
Follow up question: Was the patient left alone for long periods of time? Were they left for periods longer than 2 hrs?

5. If the quadriplegic individual was placed on a regular hospital bed, from your perspective and personal routines as a care provider or family member, can you explain why it was deemed necessary or acceptable by the facility staff?
Follow up question: Do you think there were other options, and can you describe these options?

Follow up question: Was the patient offered an air mattress of any kind? Did you request an air mattress suitable for their condition, and what was the outcome?

6. From your perspective, can you confirm with an example that proper pressure ulcer prevention guidelines were followed or not during the acute care episode above*?*

Follow up question: From your perspective, can you explain in detail how the staff could have provided better execution of the pressure ulcer prevention guidelines?

7. Were you allowed to assist the patient with the patient's regular routine or assist in pressure ulcer prevention as a personal care giver or family member during the stay in the acute care facility?

Follow up question: Did the facility disagree with you giving assistance to the patient?

Follow up question: Did you try to convince the facility of merits of giving your personal assistance to the patient, and can you give details of how the facility responded to your logic in this matter?

8. Did any facility staff member discuss repositioning, pressure ulcer prevention guidelines, or pressure ulcers with you at any time during the patient's stay or ask your personal opinion, knowing that you may have special or valuable knowledge about the patient's personal care and pressure ulcer prevention, and can you relate in detail how they approached the subject?

9. Did you as a personal care provider or family member at any time during the patient's stay in a facility have to bring up concerns about repositioning, pressure ulcer prevention guidelines, or pressure ulcer development to the facility staff based on your concerns about the quadriplegic condition, and can you give a specific example of your inquiry?

Follow up question: What was the staff member's reaction and input following your concern about pressure ulcers or prevention guidelines?

Follow up question: What was the staff member's input for solutions, and can you describe how the staff member answered your concerns?

Follow up question: From your perspective, what may have been some factors or circumstances that would have kept staff from providing proper repositioning or pressure ulcer prevention guidelines?

Follow up question: If you think repositioning failures occurred, what could have been done better by the acute care facility or staff in your opinion?

Follow up question: Were the patient's wishes fulfilled after discussion with staff members, and can you relate what was done or what changed after discussion about the patient's personal care?

Follow up question: Do you think the facility had adequate staff to address the patient's personal needs related to the condition as a quadriplegic?

Follow up question: How would you describe the customer service at the facility?

10. What do you believe could be done in general to improve repositioning or pressure ulcer prevention by acute care emergency room or facility staff for quadriplegic individuals?

11. Can you confirm that a pressure ulcer developed for the quadriplegic patient during their admittance to a facility or shortly afterward, and can you relate in detail the reasons from your perspective that may have caused the new pressure ulcer?

Follow up question: Can you relate how the pressure ulcer may have been related to repositioning offered by the acute care staff of the facility?

Follow up question: Can you relate reasons other than repositioning that may have caused their new pressure ulcer?

Follow up question: Can you relate the probability that the patient could have developed a pressure ulcer from events in the ER, and can you explain if inability by the quadriplegic individual, care provider, or family member to communicate with the staff at the time may have affected the outcome in the above situation?

12. Has your patient or family member been hospitalized specifically for a pressure ulcer, and can you detail this event?

13. Has your patient or family member ever had surgery to repair the effects of a pressure ulcer, and can you describe in detail how you believe this pressure ulcer developed and provide the length of time they were affected by the wound?

Follow up question: Can you describe the methods of wound care used before the physician decided on surgery to repair the wound?

14. Has your patient or family member had a personal history of pressure ulcers, and can you ascertain the cause of these pressure ulcers with as much detail as possible including approximate dates and general cause?

Follow up question: How long did it take them to overcome the pressure ulcer in each case*?*

Follow up question: What stage did the pressure ulcer or pressure ulcers become?

Follow up question: Did they have to stay in bed to recover?

15. Based on personal experience, what do you think are the best pressure ulcer prevention guidelines?

Follow up question: How do these procedures compare to the facility guidelines you observed?

16. During your patient or family member's experience in an acute care setting, were they ever told they had any red or discolored skin or any unblanchable red areas?

Follow up question: Did staff use adequate procedures in your perspective, considering the redness may be a Stage I pressure ulcer?

Follow up question: What procedure did the staff follow from the first recognition of a red area?

Follow up question: Were you consulted on this issue and allowed to provide input for treatment, and what was your input?

Follow up question: Was a wound specialist brought in for consultation?

17. What was the outcome of the quadriplegic patient's personal experience in the acute care setting?